

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
Well Number: 58H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Notice of Intent

Type of Submission: Notice of Intent	Type of Action APD Change
Date Sundry Submitted: 02/26/2021	Time Sundry Submitted: 01:52
Date proposed operation will begin: 03/14/2021	

Procedure Description: Cimarex Energy respectfully requests approval to change BHL, target formation, casing design, and perform offline cementing for the Vaca Draw 20-17 Federal 58H well. Proposed BHL: 100' FNL & 1040' FEL Sec. 17, 25S, 33E. Target formation: Wolfcamp; Classification: Oil Offline Cmt Procedure: 7-5/8" Intermediate Casing 1. Land casing on solid body mandrel hanger 2. Engage pack-off and lock-ring 3. Install BPV 4. Skid rig 5. Check for pressure and remove BPV 6. Circulate down casing, taking returns through casing valves 7. Pump lead and tail cement 8. Displace cement and bump the plug 9. Ensure floats are holding pressure 10. RD cement crew 11. Install BPV and TA cap Please see attached previously approved detailed plan and diagram for review. Additional Attachments C102, BOP/Ck Manifold, Directional Plan, Drilling Plan, Multibowl WH, & OLC plan.

Application

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COMPANY

Section 1 - General

APD ID: 10400034515

Tie to previous NOS?

Submission Date:

BLM Office: CARLSBAD

User:

Title:

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM026394

Lease Acres:

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? NO

Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? Y

Permitting Agent? NO

APD Operator: CIMAREX ENERGY COMPANY

Operator letter of designation:

Operator Info

Operator Organization Name: CIMAREX ENERGY COMPANY

Operator Address: 600 N MARIENFELD STREET ST SUITE 600

Zip: 79701

Operator PO Box:

Operator City: MIDLAND

State: TX

Operator Phone: (432)571-7800

Operator Internet Address: tstathem@cimarex.com

Section 2 - Well Information

Well in Master Development Plan? NO

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

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Well API Number: 3002546120

Field/Pool or Exploratory? Field and Pool

Field Name: WC-025 G-09
S253236A; UPR WOLFCAMP

Pool Name: WC-025 G-06
S253329D

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Is the proposed well in a Helium production area? N

Use Existing Well Pad? Y

New surface disturbance? Y

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name: VACA
DRAW 20-17 FEDERAL

Number: E2E2 PAD 1

Well Class: HORIZONTAL

Number of Legs: 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

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Is the proposed well in an area containing other mineral resources? USEABLE WATER

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 24 Miles

Distance to nearest well: 20 FT

Distance to lease line: 390 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: Vaca_Draw_20_17_Fed_58H_C102_Plat_20180928071559.pdf
C102_VacaDraw_2017_Fed_58H_20210218195143.pdf

Well work start Date: 02/01/2019

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number:

Reference Datum: GROUND LEVEL

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1	390	FSL	900	FEL	25S	33E	20	Aliquot SESE	32.10989	- 103.588675	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 026394	3399	0	0	Y
KOP Leg #1	236	FSL	1040	FEL	25S	33E	20	Aliquot SESE	32.109461	- 103.589128	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 026394	- 8416	11827	11815	Y
PPP Leg #1-1	390	FSL	1040	FEL	25S	33E	20	Aliquot SESE	32.109898	- 103.589127	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 026394	- 8772	12229	12171	Y

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Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
EXIT Leg #1	100	FNL	1040	FEL	25S	33E	17	Aliquot NENE	32.137578	-103.58911	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-8926	22332	12325	Y
BHL Leg #1	100	FNL	1040	FEL	25S	33E	17	Aliquot NENE	32.137578	-103.589111	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-8926	22332	12325	Y

Drilling Plan

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1611415	RUSTLER	3421	935	935		USEABLE WATER	N
1611416	SALADO	2123	1298	1298		NONE	N
1611414	CASTILE	-1293	4714	4714		NONE	N
1611406	LAMAR	-1488	4909	4909		NONE	N
1611411	BELL CANYON	-1516	4937	4937		NONE	N
1611412	CHERRY CANYON	-2569	5990	5990		NONE	N
1611413	BRUSHY CANYON	-4115	7536	7536		NATURAL GAS, OIL	N
1611409	BONE SPRING	-5611	9032	9032		NATURAL GAS, OIL	Y
1611417	BONE SPRING 1ST	-6590	10011	10011		NATURAL GAS, OIL	N
1611407	BONE SPRING 2ND	-7162	10583	10583		NATURAL GAS, OIL	N
1611410	BONE SPRING 3RD	-8301	11722	11722		OIL	N
1611408	WOLFCAMP	-8768	12189	12189		NATURAL GAS, OIL	N

Section 2 - Blowout Prevention

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Pressure Rating (PSI): 2M

Rating Depth: 4917

Equipment: A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

Requesting Variance? YES

Variance request: Co-flex line between the BOP and choke manifold. Certification for proposed co-flex hose is attached. The hose is not required by the manufacturer to be anchored. In the event the specific hose is not available, one of equal or higher rating will be used. Variance to include Hammer Union connections on lines downstream of the buffer tank only.

Testing Procedure: A multi-bowl wellhead system will be utilized. After running the 13-3/8" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 3000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 3000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2. The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office. The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative. All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 3000 psi. The surface casing string will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater. The casing string utilizing steel body pack-off will be tested to 70% of casing burst. If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

Choke Diagram Attachment:

BOP Diagram Attachment:

Pressure Rating (PSI): 3M

Rating Depth: 19819

Equipment: A BOP consisting of three rams, including one blind ram and two pipe rams and one annular preventer. An accumulator that meets the requirements in Onshore Order #2 for the pressure rating of the BOP stack. A rotating head may be installed as needed. A Kelly clock will be installed and maintained in operable condition and a drill string safety valve in the open position will be available on the rig floor.

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Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	
1	SURFACE	17.5	13.375	NEW	NON API	N	0	985	0	985	0	985	985	H-40	48	ST&C	1.64	3.84	BUOY	6.81	BUOY	6.81
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4917	0	4917	0	4917	4917	J-55	40	LT&C	1.46	1.51	BUOY	2.64	BUOY	2.64
3	PRODUCTION	8.75	5.5	NEW	API	N	0	9720	0	9720	0	9720	9720	L-80	20	LT&C	1.94	2.02	BUOY	2.09	BUOY	2.09
4	PRODUCTION	8.75	5.5	NEW	API	N	9720	19819	9720	9940	9720	19819	10099	L-80	20	BUTT	1.9	1.93	BUOY	99	BUOY	99

Casing Attachments

Casing ID: 1String Type: SURFACE

Inspection Document:

Spec Document:

Vaca_Draw_20_17_Fed_58H_Surf_Casing_Spec_Sheet_20181002114729.pdf

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_58H_Casing_Assumptions_20181002114742.pdf

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Casing Attachments

Casing ID: 2String Type:INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_58H_Casing_Assumptions_20181002114821.pdf

Casing ID: 3String Type:PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_58H_Casing_Assumptions_20181002114904.pdf

Casing ID: 4String Type:PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_58H_Casing_Assumptions_20181002115016.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
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String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	985	415	1.72	13.5	713	50	Class C	Bentonite
SURFACE	Tail		0	985	195	1.34	14.8	260	25	Class C	LCM
INTERMEDIATE	Lead		0	4917	935	1.88	12.9	1756	50	35:65 (Poz:C)	Salt, Bentonite
INTERMEDIATE	Tail		0	4917	288	1.34	14.8	385	25	Class C	LCM
PRODUCTION	Lead		0	9720	432	3.64	10.3	1569	25	Tuned Light	LCM
PRODUCTION	Tail		0	9720	2160	1.3	14.2	2807	10	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS
PRODUCTION	Lead		9720	1981 9	432	3.64	10.3	1569	25	Tuned Light	LCM
PRODUCTION	Tail		9720	1981 9	2160	1.3	14.2	2807	10	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials will be kept on location at all times in order to combat lost circulation or unexpected kicks. In order to run DSTs, open hole logs, and casing, the viscosity and water loss may have to be adjusted in order to meet these needs.

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	985	SPUD MUD	8.3	8.8							
985	4917	SALT SATURATED	9.7	10.2							

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4917	1981 9	OTHER : FW/Cut Brine	8.5	9							

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

No DST Planned

List of open and cased hole logs run in the well:

CNL,DS,GR

Coring operation description for the well:

n/a

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4651

Anticipated Surface Pressure: 1939

Anticipated Bottom Hole Temperature(F): 169

Anticipated abnormal pressures, temperatures, or potential geologic hazards? YES

Describe:

Lost circulation may be encountered in the Delaware mountain group. Abnormal pressure as well as hole stability issues may be encountered in the Wolfcamp.

Contingency Plans geoharzards description:

Lost circulation material will be available, as well as additional drilling fluid along with the fluid volume in the drilling rig pit system. Drilling fluid can be mixed on location or mixed in vendor mud plant and trucked to location if needed. Sufficient barite will be available to maintain appropriate mud weight for the Wolfcamp interval.

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Vaca_Draw_20_17_Fed_58H_H2S_Plan_20181002114603.pdf

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Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Vaca_Draw_20_17_Fed_58H_Directional_Plan_20181002114619.pdf
Vaca_Draw_20_17_Fed_58H_AC_Report_20181002114618.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Vaca_Draw_20_17_Fed_58H_Flex_Hose_20181002114635.pdf
Vaca_Draw_20_17_Fed_58H_Drilling_Plan_20181002114630.pdf
Vaca_Draw_20_17_Fed_58H_Gas_Capture_Plan_20181002114636.pdf

Other Variance attachment:

Vaca_Draw_20_17_Fed_58H_Multibowl_Wellhead_20181002114649.pdf
Vaca_Draw_20_17_Fed_58H_Multibowl_Procedure_20181002114648.pdf

SUPO

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Vaca_Draw_20_17_Fed_Existing_Road_ROW_Approved_9_6_13_20190201102258.pdf

Existing Road Purpose: ACCESS

Row(s) Exist? YES

ROW ID(s)

ID: NM-130688

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

Vaca_Draw_20_17_Fed_E2E2_Pad_1_Road_ROW_20190305093852.pdf
Vaca_Draw_20_17_Fed_East_Zone_1_2_CTB_Road_ROW_20190305093855.pdf

New road type: COLLECTOR

Length: 3725 Feet Width (ft.): 30

Max slope (%): 20 Max grade (%): 6

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

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New road travel width: 18

New road access erosion control: The side slopes of any drainage channels or swales that are crossed will be re-contoured to original grade and compacted and mulched as necessary to avoid erosion. Where steeper slopes cannot be avoided, water bars or silt fence will be constructed, mulch/rip-rap applied, or other measures employed as necessary to control erosion. Hay bales, straw waddles or silt fence may also be installed to control erosion as needed. All disturbed areas will be seeded with a mix appropriate for the area unless specified otherwise by the landowner.

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Turnout? N

Access surfacing type: GRAVEL

Access topsoil source: ONSITE

Access surfacing type description:

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Push off and stockpile alongside the location.

Access other construction information:

Access miscellaneous information:

Number of access turnouts:

Access turnout map:

Drainage Control

New road drainage crossing: CULVERT,LOW WATER,OTHER

Drainage Control comments: To control and prevent potentially contaminated precipitation from leaving the pad site, a perimeter berm and settlement pond will be installed. Contaminated water will be removed from pond, stored in waste tanks, and disposed of at a state approved facility. Standing water or puddles will not be allowed. Drainage ditches would be established and maintained on the pad and along access roads to divert water away from operations. Natural drainage areas disturbed during construction would be re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured, and reclaimed to near original condition to re-establish natural drainage.

Road Drainage Control Structures (DCS) description: N/A

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

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Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

Vaca_Draw_20_17_Fed_E2E2_Pad_1_Road_ROW_20190305093852.pdf

Vaca_Draw_20_17_Fed_East_Zone_1_2_CTB_Road_ROW_20190305093855.pdf

New road type:

Length:	Width (ft.):
Max slope (%):	Max grade (%):

Army Corp of Engineers (ACOE) permit required?

ACOE Permit Number(s):

New road travel width:

New road access erosion control:

New road access plan or profile prepared?

New road access plan attachment:

Access road engineering design?

Access road engineering design attachment:

Turnout?

Access surfacing type:

Access topsoil source:

Access surfacing type description:

Access onsite topsoil source depth:

Offsite topsoil source description:

Onsite topsoil removal process:

Access other construction information:

Access miscellaneous information:

Number of access turnouts:	Access turnout map:
----------------------------	---------------------

Drainage Control

New road drainage crossing:

Drainage Control comments:

Road Drainage Control Structures (DCS) description:

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

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Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
Well Number: 58H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

Vaca_Draw_20_17_Fed_E2E2_Pad_1_Road_ROW_20190305093852.pdf

Vaca_Draw_20_17_Fed_East_Zone_1_2_CTB_Road_ROW_20190305093855.pdf

New road type:

Length:	Width (ft.):
Max slope (%):	Max grade (%):

Army Corp of Engineers (ACOE) permit required?

ACOE Permit Number(s):

New road travel width:

New road access erosion control:

New road access plan or profile prepared?

New road access plan attachment:

Access road engineering design?

Access road engineering design attachment:

Turnout?

Access surfacing type:

Access topsoil source:

Access surfacing type description:

Access onsite topsoil source depth:

Offsite topsoil source description:

Onsite topsoil removal process:

Access other construction information:

Access miscellaneous information:

Number of access turnouts:	Access turnout map:
----------------------------	---------------------

Drainage Control

New road drainage crossing:

Drainage Control comments:

Road Drainage Control Structures (DCS) description:

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

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Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
Well Number: 58H	Type of Well: OIL WELL	Allottee or Tribe Name:
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US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Vaca_Draw_20_17_Fed_E2E2_Pad_1_Mile_Radius_Existing_Wells_20180928071816.pdf

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: Production facilities will be the same in the Vaca Draw 20-17 Fed 43H, 44H, 45H, 57H, 58H, 59H, 71H, 72H, & 73H.

Production Facilities map:

Vaca_Draw_20_17_Fed_East_Zone_2_CTB_Battery_Layout_20190305093955.pdf

Vaca_Draw_20_17_Fed_East_Zone_1_CTB_Battery_Layout_20190305093949.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source type:	MUNICIPAL		
Water source use type:	SURFACE CASING		
	INTERMEDIATE/PRODUCTION CASING		
Source latitude:			Source longitude:
Source datum:			
Water source permit type:	WATER RIGHT		
Permit Number:			
Water source transport method:	PIPELINE		
	TRUCKING		
Source land ownership:	STATE		
Source transportation land ownership:	STATE		
Water source volume (barrels):	5000	Source volume (acre-feet):	0.6444655
Source volume (gal):	210000		

Water source and transportation map:

Vaca_Draw_20_17_Fed_E2E2_Pad_1_Drilling_Water_Route_20180928071900.pdf

Water source comments:

New water well? NO

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Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
Well Number: 58H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

New Water Well Info

Well latitude:	Well Longitude:	Well datum:
Well target aquifer:		
Est. depth to top of aquifer(ft):	Est thickness of aquifer:	
Aquifer comments:		
Aquifer documentation:		
Well depth (ft):	Well casing type:	
Well casing outside diameter (in.):	Well casing inside diameter (in.):	
New water well casing?	Used casing source:	
Drilling method:	Drill material:	
Grout material:	Grout depth:	
Casing length (ft.):	Casing top depth (ft.):	
Well Production type:	Completion Method:	
Water well additional information:		
State appropriation permit:		
Additional information attachment:		

Section 6 - Construction Materials

Using any construction materials: YES

Construction Materials description: The drilling and testing operations will be conducted on a watered and compacted native soil grade. Soft spots will be covered with caliche, free of large rocks (3" diameter). Upon completion as a commercial producer the location will be covered with caliche, free of large rocks (3" dia.) from an existing privately owned gravel pit.

Construction Materials source location attachment:

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drilling Fluids, drill cuttings, water and other waste produced from the well during drilling operations.

Amount of waste: 15000 barrels

Waste disposal frequency : Weekly

Safe containment description: n/a

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Haul to R360 commercial Disposal

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Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
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Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Waste type: GARBAGE

Waste content description: Garbage and trash produced during drilling and completion operations

Amount of waste: 32500 pounds

Waste disposal frequency : Weekly

Safe containment description: n/a

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY Disposal location ownership: COMMERCIAL

Disposal type description:

Disposal location description: Windmill Spraying Service hauls trash to Lea County Landfill

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.) Reserve pit width (ft.)

Reserve pit depth (ft.) Reserve pit volume (cu. yd.)

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? NO

Description of cuttings location

Cuttings area length (ft.) Cuttings area width (ft.)

Cuttings area depth (ft.) Cuttings area volume (cu. yd.)

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

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Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
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Section 9 - Well Site Layout

Well Site Layout Diagram:
Vaca_Draw_20_17_Fed_58H_Wellsite_Layout_20180928071933.pdf
Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance Multiple Well Pad Name: VACA DRAW 20-17 FEDERAL
Multiple Well Pad Number: E2E2 PAD 1

Recontouring attachment:
Vaca_Draw_20_17_Fed_E2E2_Pad_1_Interim_Reclaim_20180928071957.pdf

Drainage/Erosion control construction: To control and prevent potentially contaminated precipitation from leaving the pad site, a perimeter berm and settlement pond will be installed. Contaminated water will be removed from pond, stored in waste tanks, and disposed of at a state approved facility. Standing water or puddles will not be allowed. Drainage ditches would be established and maintained on the pad and along access roads to divert water away from operations. Natural drainage areas disturbed during construction would be re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured to near original condition prior to construction. Erosion Control Best Management Practices would be used where necessary and consist of seeding, fiber rolls, water bars, silt fences, and temporary diversion dikes. Areas disturbed during construction that are no longer needed for operations would be obliterated, re-contoured, and reclaimed to near original condition to re-establish natural drainage.

Drainage/Erosion control reclamation: All disturbed and re-contoured areas would be reseeded according to specifications. Approved seed mixtures would be certified weed free and consist of grasses, forbs, or shrubs similar to the surrounding area. Compacted soil areas may need to be obliterated and reclaimed to near natural conditions by re-contouring all slopes to facilitate and re-establish natural drainage.

Well pad proposed disturbance (acres): 6.93	Well pad interim reclamation (acres): 3.55	Well pad long term disturbance (acres): 3.36
Road proposed disturbance (acres): 2.565	Road interim reclamation (acres): 0	Road long term disturbance (acres): 2.565
Powerline proposed disturbance (acres): 0	Powerline interim reclamation (acres): 0	Powerline long term disturbance (acres): 0
Pipeline proposed disturbance (acres): 10.37	Pipeline interim reclamation (acres): 0	Pipeline long term disturbance (acres): 10.37
Other proposed disturbance (acres): 13.908	Other interim reclamation (acres): 3.4	Other long term disturbance (acres): 10.508
Total proposed disturbance: 33.773	Total interim reclamation: 6.95	Total long term disturbance: 26.803

Disturbance Comments: Flowline: 2039 Gas lift: 2039 Access Road: 3725 Sales: 5619 SWD: 3944 Temp fresh water line: 14,855' CTB Zone 1: 5.256 acres, CTB Zone 2: 5.252 acres

Reconstruction method: After well plugging, all disturbed areas would be returned to the original contour or a contour that blends with the surrounding landform including roads unless the surface owner requests that they be left intact. In consultation with the surface owners it will be determined if any gravel or similar materials used to reinforce an area are to be removed, buried, or left in place during final reclamation. Salvaged topsoil, if any, would be re-spread evenly over the surfaces to be re-vegetated. As necessary, the soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation. Site preparation may include gouging, scarifying, dozer track-walking, mulching, or fertilizing. Reclamation, Re-vegetation, and Drainage: All disturbed and re-contoured areas would be reseeded using techniques outlined under Phase I and II of this plan or as specified by the land owner. Approved seed mixtures would be certified weed

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Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
Well Number: 58H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

free and consist of grasses, forbs, or shrubs similar to the surrounding area. Compacted soil areas may need to be obliterated and reclaimed to near natural conditions by re-contouring all slopes to facilitate and re-establish natural drainage. **Topsoil redistribution:** Salvaged topsoil, if any, would be re-spread evenly over the surfaces to be re-vegetated.

Soil treatment: As necessary, the soil surface would be prepared to provide a seedbed for re-establishment of desirable vegetation. Site preparation may include gouging, scarifying, dozer track-walking, mulching or fertilizing. **Existing Vegetation at the well pad:**

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed Summary		Total pounds/Acre:
Seed Type	Pounds/Acre	

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: Amithy	Last Name: Crawford
Phone: (432)620-1909	Email: acrawford@cimarex.com

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Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
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Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: N/A

Weed treatment plan attachment:

Monitoring plan description: N/A

Monitoring plan attachment:

Success standards: N/A

Pit closure description: N/A

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

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Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
Well Number: 58H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Fee Owner: Hughes Properties LLC (Trey Hughes) Fee Owner Address:
Phone: (575)361-3217 Email:
Surface use plan certification: NO
Surface use plan certification document:
Surface access agreement or bond: Agreement
Surface Access Agreement Need description: See attached Operator-Land Owner Agreement
Surface Access Bond BLM or Forest Service:
BLM Surface Access Bond number:
USFS Surface access bond number:

Section 12 - Other Information

Right of Way needed? YES Use APD as ROW? YES
ROW Type(s): 281001 ROW - ROADS,288100 ROW – O&G Pipeline,289001 ROW- O&G Well Pad,FLPMA
(Powerline),Other

ROW Applications

SUPO Additional Information: Batteries, Flow/Gas lift route, SWD route & power route will be the same for Vaca Draw 20-17 Fed 43H, 44H, 45H, 57H, 58H, 59H, 71H, 72H & 73H
Use a previously conducted onsite? YES

Previous Onsite information: Onsite with BLM (Jeff Robertson) and Cimarex (Barry Hunt) on July 24, 2018.

Other SUPO Attachment

- Vaca_Draw_20_17_Fed_Temp_Water_Route_20180928072055.pdf
- Vaca_Draw_20_17_Fed_E2E2_Pad_1_Road_Description_20180928072048.pdf
- Vaca_Draw_20_17_Fed_E2E2_Pad_1_Flow_Gas_lift_ROW_20190305094315.pdf
- Vaca_Draw_20_17_Fed_East_Zone_1_2_CTB_SWD_ROW_20190305094319.pdf
- Vaca_Draw_20_17_Fed_E2E2_Pad_1_Public_Access_20180928072048.pdf
- Vaca_Draw_20_17_Fed_58H_Operator_Land_Ower_agmt_20190131124248.pdf
- Vaca_Draw_58H_Pkt_for_Jeff__2_20190305094342.pdf
- Vaca_Draw_20_17_Fed_East_Zone_1_2_CTB_Gas_Sales_ROW_20190305094317.pdf
- Vaca_Draw_58H_Pkt_for_Jeff__1_20190305094333.pdf
- Vaca_Draw_20_17_Fed_58H_SUPO_20190305094313.pdf

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Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
Well Number: 58H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

PWD

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

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Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
Well Number: 58H	Type of Well: OIL WELL	Allottee or Tribe Name:
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US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD disturbance (acres): PWD surface owner:

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

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Well Number: 58H	Type of Well: OIL WELL	Allottee or Tribe Name:
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Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type: Injection well name:

Assigned injection well API number? Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

Operator Certification

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.10989 / -103.588675	County or Parish/State: LEA / NM
Well Number: 58H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME:	Signed on: 02/26/2021	
Title:		
Street Address:		
City:	State:	Zip:
Phone:		
Email address:		

Field Representative

Representative Name:		
Street Address:		
City:	State:	Zip:
Phone:		
Email address:		

NOI Attachments

Procedure Description

VacaDraw_2017_Fed_58H_Sundry_Attachment_All_20210218195103.pdf

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Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546120	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Operator Certification

I certify that the foregoing is true and correct. Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction. Electronic submission of Sundry Notices through this system satisfies regulations requiring a submission of Form 3160-5 or a Sundry Notice.

Operator Electronic Signature: STATHEM	Signed on: FEB 26, 2021 01:52 PM
Name: CIMAREX ENERGY COMPANY	
Title: Mngr Regulatory Compliance	
Street Address: 600 N MARIENFELD STREET ST SUITE 600	
City: MIDLAND	State: TX
Phone: (432) 571-7800	
Email address: tstathem@cimarex.com	

Field Representative

Representative Name:		
Street Address:		
City:	State:	Zip:
Phone:		
Email address:		

BLM Point of Contact

BLM POC Name: ZOTA M STEVENS	BLM POC Title: Petroleum Engineer
BLM POC Phone: 5752345998	BLM POC Email Address: ZSTEVENS@BLM.GOV
Disposition: Approved	Disposition Date: 02/26/2021
Signature: zota stevens	

1. Geological Formations

TVD of target 12,325

Pilot Hole TD N/A

MD at TD 22,332

Deepest expected fresh water

Formation	Depth (TVD) from KB	Water/Mineral Bearing/Target Zone	Hazards
Rustler	935	N/A	
Top of Salt	1298	N/A	
Base of Salt	4714	N/A	
Lamar	4909	N/A	
Bell Canyon	4937	N/A	
Cherry Canyon	5990	N/A	
Brushy Canyon	7536	Hydrocarbons	
Bone Spring	9032	Hydrocarbons	
Bone Spring Target	9940	Hydrocarbons	
1st Bone Spring Sand	10011	Hydrocarbons	
2nd Bone Spring Sand	10583	Hydrocarbons	
3rd Bone Spring Sand	11722	Hydrocarbons	
Wolfcamp	12189	Hydrocarbons	

2. Casing Program

Hole Size	Casing Depth From	Casing Depth To	Setting Depth TVD	Casing Size	Weight (lb/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
14 3/4	0	985	985	10-3/4"	40.50	J-55	BT&C	3.70	7.34	15.77
9 7/8	0	12452	12276	7-5/8"	29.70	L-80	BT&C	2.49	1.20	1.82
6 3/4	0	11800	11800	5-1/2"	23.00	L-80	LT&C	1.42	1.26	2.20
6 3/4	11800	22332	12325	5"	18.00	P-110	BT&C	1.64	1.66	61.38
BLM Minimum Safety Factor								1.125	1	1.6 Dry 1.8 Wet

TVD was used on all calculations.

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

Request Variance for 5-1/2" x 7-5/8" annular clearance. The portion that does not meet clearance will not be cemented

Cimarex Energy Co., Vaca Draw 20-17 Federal 58H

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	Y
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	N
Is well within the designated 4 string boundary.	N
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	N
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	N
Is 2nd string set 100' to 600' below the base of salt?	N
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	N
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	N
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	N
Is AC Report included?	N

3. Cementing Program

Casing	# Sk	Wt. lb/gal	Yld ft ³ /sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surface	332	13.50	1.72	9.15	15.5	Lead: Class C + Bentonite
	156	14.80	1.34	6.32	9.5	Tail: Class C + LCM
Intermediate Stage 1	581	10.30	3.64	22.18		Lead: Tuned Light + LCM
	198	14.80	1.36	6.57	9.5	Tail: Class C + Retarder
Intermediate Stage 2	794	12.90	1.88	9.65	12	Lead: 35:65 (Poz:C) + Salt + Bentonite
Production	1360	14.20	1.30	5.86	14:30	Tail: 50:50 (Poz:H) + Salt + Bentonite + Fluid Loss + Dispersant + SMS

DV tool with possible annular casing packer as needed is proposed at a depth of +/- 4,900'.

Casing String	TOC	% Excess
Surface	0	42
Intermediate Stage 1	4900	47
Intermediate Stage 2	0	40
Production	12000	25

Cimarex request the ability to perform casing integrity tests after plug bump of cement job.

4. Pressure Control Equipment

A variance is requested for the use of a diverter on the surface casing. See attached for schematic.					
BOP installed and tested before drilling which hole?	Size	Min Required WP	Type		Tested To
9 7/8	13 5/8	5M	Annular	X	50% of working pressure
			Blind Ram		5M
			Pipe Ram	X	
			Double Ram	X	
			Other		
6 3/4	13 5/8	10M	Annular	X	50% of working pressure
			Blind Ram		10M
			Pipe Ram	X	
			Double Ram	X	
			Other		

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold. See attached schematics.

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.				
X	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.				
	Y	Are anchors required by manufacturer?			

5. Mud Program

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0' to 985'	FW Spud Mud	7.83 - 8.33	30-32	N/C
985' to 12452'	Brine Diesel Emulsion	8.50 - 9.00	30-35	N/C
12452' to 22332'	OBM	12.30 - 12.80	50-70	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

The Brine Emulsion is completely saturated brine fluid that ties diesel into itself to lower the weight of the fluid. The drilling fluid is completely salt saturated.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring
---	-----------------------------

6. Logging and Testing Procedures

Logging, Coring and Testing	
	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No logs are planned based on well control or offset log information.
	Drill stem test?
	Coring?

Additional Logs Planned	Interval
-------------------------	----------

7. Drilling Conditions

Condition	
BH Pressure at deepest TVD	8203 psi
Abnormal Temperature	No

Hydrogen Sulfide (H₂S) monitors will be installed prior to drilling out the surface shoe. If H₂S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.

X	H ₂ S is present
X	H ₂ S plan is attached

8. Other Facets of Operation**9. Wellhead**

A multi-bowl wellhead system will be utilized.

After running the 10-3/4" surface casing, a 13 5/8" BOP/BOPE system with a minimum working pressure of 10000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 10000 psi test. Annular will be tested to 50% of working pressure. The pressure test will be repeated at least every 30 days, as per Onshore Order No. 2.

The multi-bowl wellhead will be installed by vendor's representative. A copy of the installation instructions has been sent to the BLM field office.

The wellhead will be installed by a third-party welder while being monitored by the wellhead vendor representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 10000 psi.

All casing strings will be tested as per Onshore Order No.2 to atleast 0.22 psi/ft or 1,500 whichever is greater and not to exceed 70% of casing burst.

If well conditions dictate conventional slips will be set and BOPE will be tested to appropriate pressures based on permitted pressure requirements.

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 30-025-46120	² Pool Code 98180	³ Pool Name Wildcat Wolfcamp	⁴ Property Code 319775	⁵ Property Name VACA DRAW 20-17 FEDERAL	⁶ Well Number 58H
⁷ OGRID No. 215099	⁸ Operator Name CIMAREX ENERGY CO.	⁹ Elevation 3398.8'	WC-025 G-09 S253309P;UPR WOLFCAMP		

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	20	25S	33E		390	SOUTH	900	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
A	17	25S	33E		100	NORTH	1040	EAST	LEA
¹² Dedicated Acres 6.40	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.

¹⁶

- = SURFACE HOLE LOCATION
- ◆ = LANDING POINT/FIRST TAKE POINT
- = BOTTOM HOLE LOCATION/ LAST TAKE POINT
- ▲ = SECTION CORNER LOCATED

2000' 1000' 0' 2000'

SCALE

REV: 1 02-08-21 C.D. (WELL BORE CHANGE)

LINE TABLE

LINE	DIRECTION	LENGTH
L1	S89°56'21"W	140.06'
L2	S89°56'49"W	2644.60'

NAD 83 (SHL)
LATITUDE = 32°06'35.63" (32.109898°)
LONGITUDE = 103°35'19.23" (103.588675°)

NAD 27 (SHL)
LATITUDE = 32°06'35.18" (32.109773°)
LONGITUDE = 103°35'17.53" (103.588203°)

STATE PLANE NAD 83 (N.M. EAST)
N: 404513.51' E: 771899.71'

STATE PLANE NAD 27 (N.M. EAST)
N: 404455.73' E: 730713.53'

NAD 83 (LP/FTP)
LATITUDE = 32°06'35.63" (32.109898°)
LONGITUDE = 103°35'20.86" (103.589127°)

NAD 27 (LP/FTP)
LATITUDE = 32°06'35.18" (32.109773°)
LONGITUDE = 103°35'19.16" (103.588656°)

STATE PLANE NAD 83 (N.M. EAST)
N: 404512.78' E: 771759.68'

STATE PLANE NAD 27 (N.M. EAST)
N: 404455.00' E: 730573.50'

NAD 83 (LTP/BHL)
LATITUDE = 32°08'15.28" (32.137578°)
LONGITUDE = 103°35'20.80" (103.589111°)

NAD 27 (LTP/BHL)
LATITUDE = 32°08'14.83" (32.137453°)
LONGITUDE = 103°35'19.09" (103.588637°)

STATE PLANE NAD 83 (N.M. EAST)
N: 414582.41' E: 771695.29'

STATE PLANE NAD 27 (N.M. EAST)
N: 414524.38' E: 730509.58'

NOTE:

- Distances referenced on plat to section lines are perpendicular.
- Basis of Bearing is a Transverse Mercator Projection with a Central Meridian of W103°53'00" (NAD 83)

Detail "A"
No Scale

17

20

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.

Terri Stathem 2/18/2021

Signature Date

Terri Stathem

Printed Name

TStathem@cimarex.com

Email Address

18 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

July 27, 2018

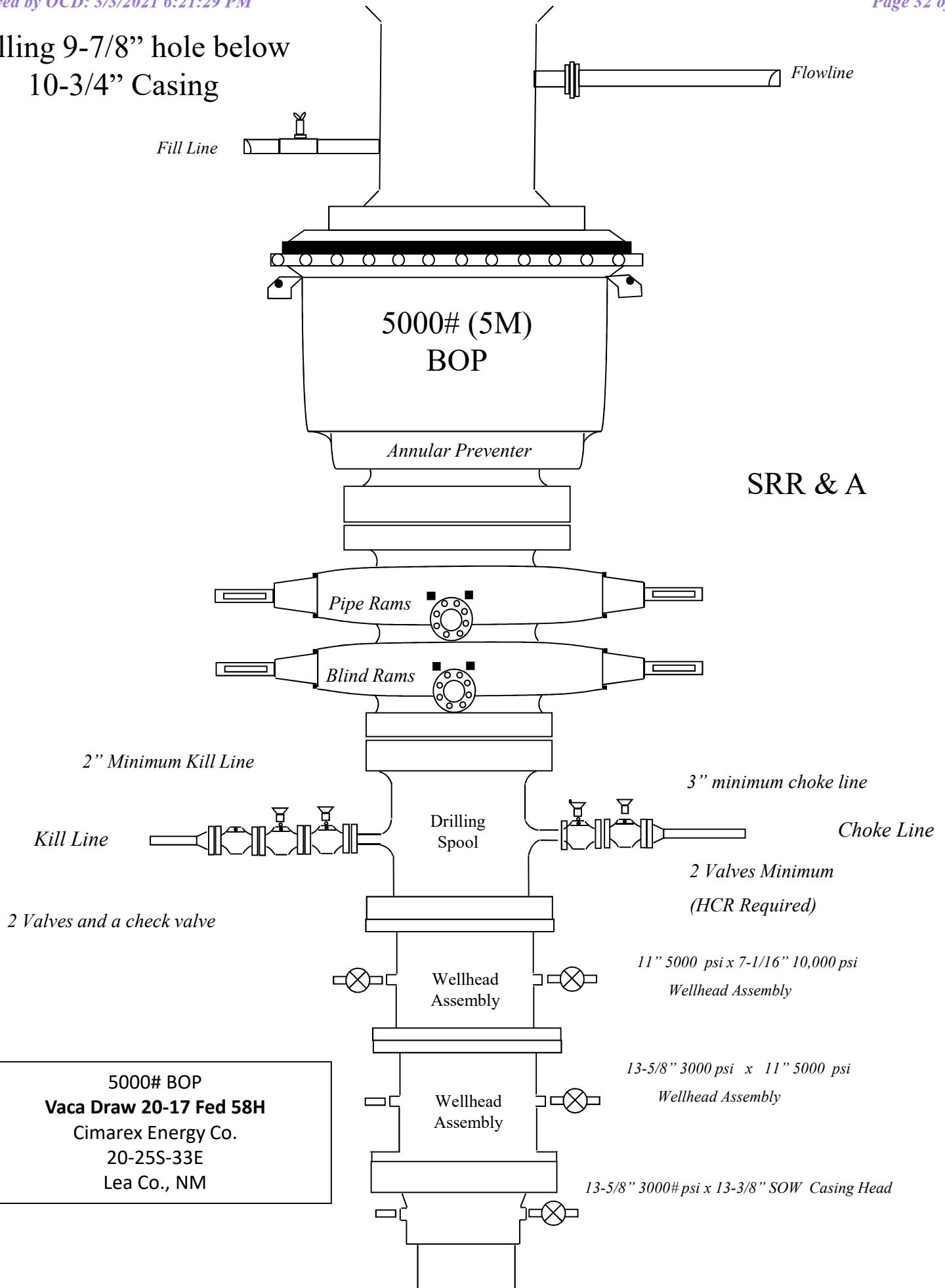
Date of Survey

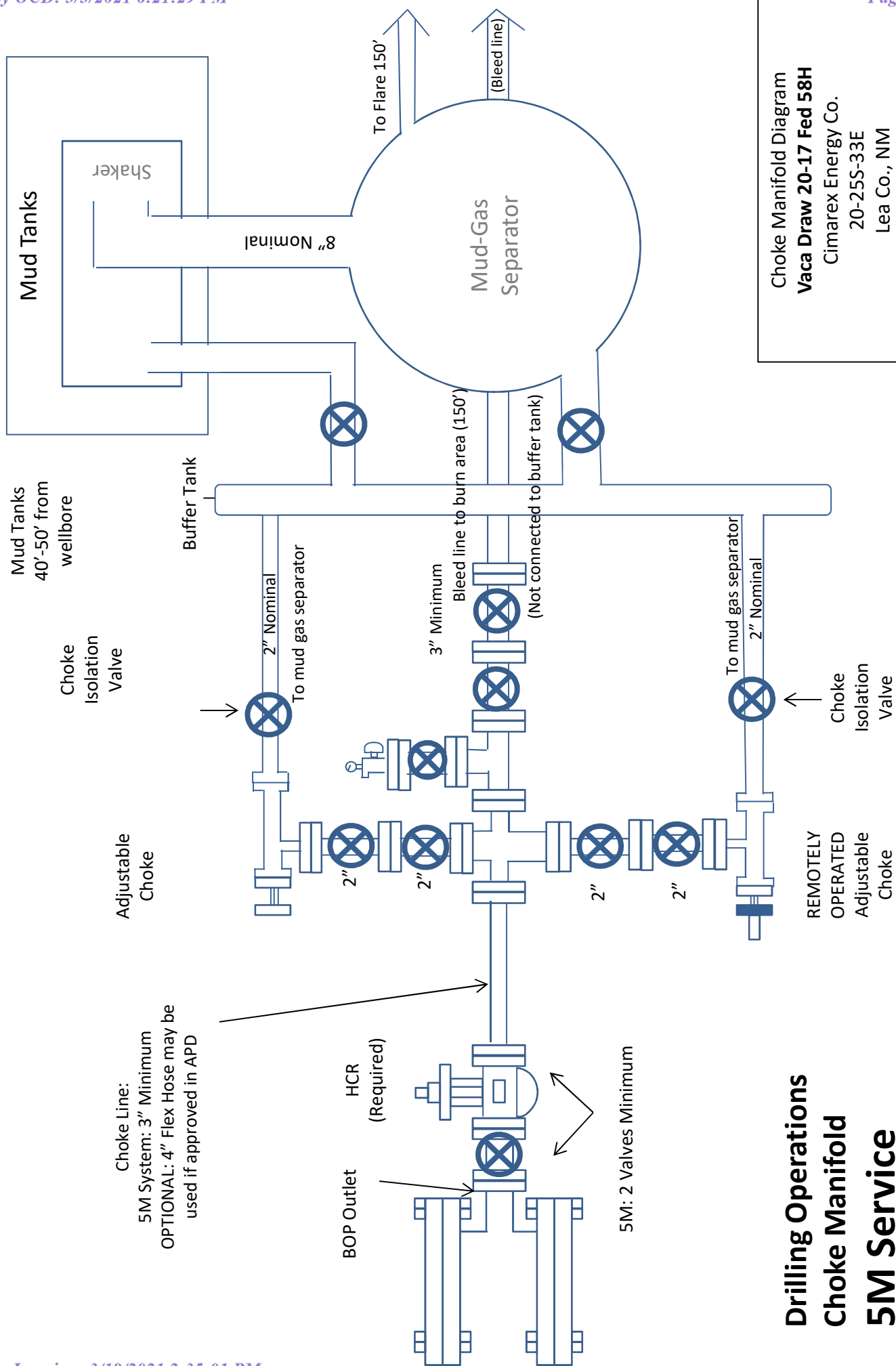
Signature and Seal of Professional Surveyor:

PAUL BUCHELE
NEW MEXICO
23782
02-08-21
PROFESSIONAL SURVEYOR

Certificate Number:

Drilling 9-7/8" hole below
10-3/4" Casing

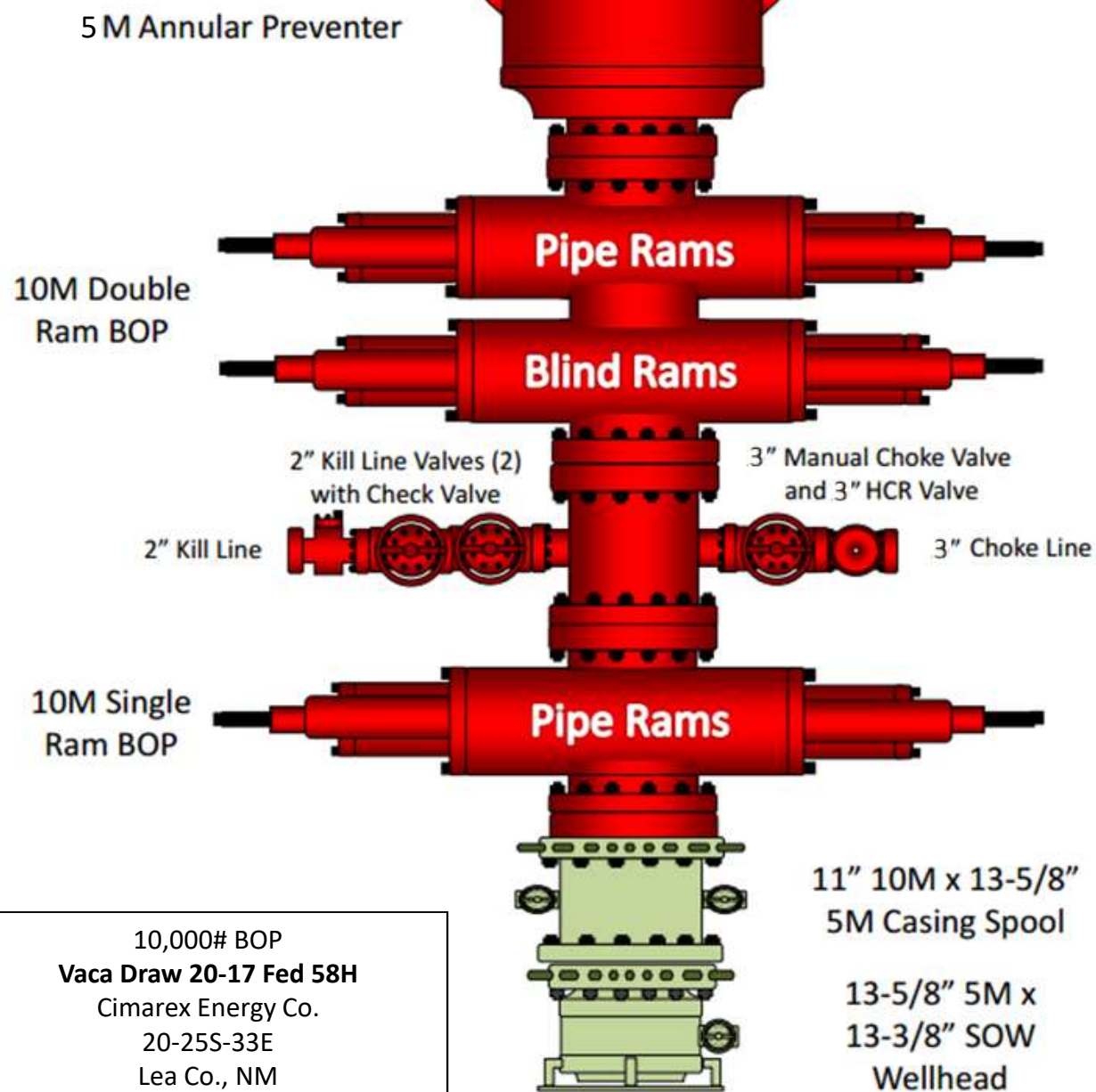




Choke Manifold Diagram
Vaca Draw 20-17 Fed 58H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

**Drilling Operations
Choke Manifold
5M Service**

Drilling 6 3/4" Hole below
7-5/8" Casing



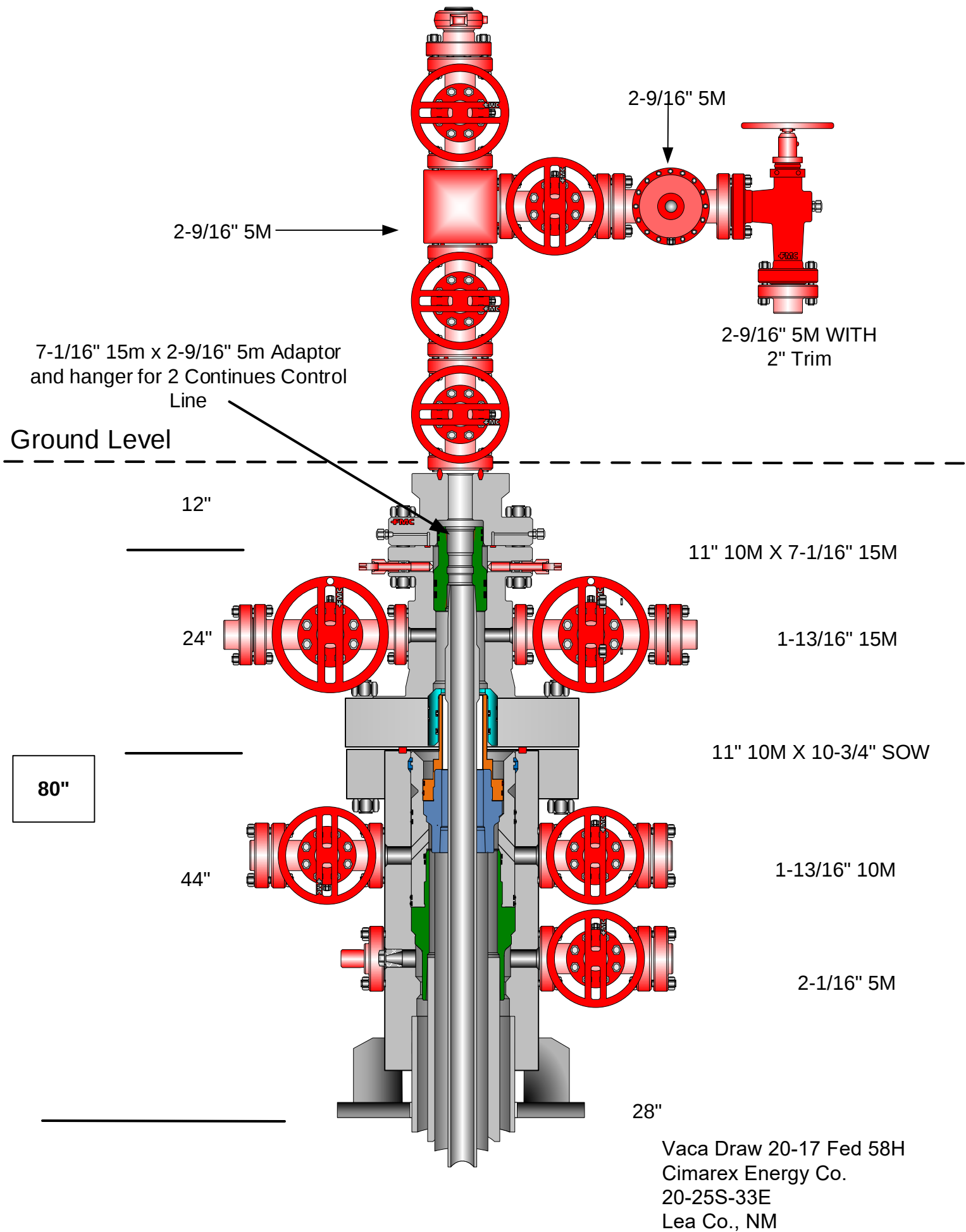




CACTUS FOR SERVICE
WEARBUSHING
IN CASING HEAD &
CASING SPOOL

LEA CO., NM

Multi-bowl Wellhead Diagram



Vertical Section (ft) Azim = 359.63° Scale = 1:741.17(ft) Origin = 0N/-S, 0E/-W

Schlumberger**Cimarex Vaca Draw 20-17 Federal #58H Rev1 RM 09Feb21 Proposal****Geodetic Report**

(Def Plan)



Report Date: February 09, 2021 - 12:41 PM
Client: Cimarex Energy
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Vaca Draw 20-17 Federal #58H / New Slot
Well: Vaca Draw 20-17 Federal #58H
Borehole: Vaca Draw 20-17 Federal #58H
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Vaca Draw 20-17 Federal #58H Rev1 RM 09Feb21
Survey Date: September 24, 2018
Tort / AHD / DDI / ERD Ratio: 104.000 ° / 10441.577 ft / 6.294 / 0.847
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 6' 35.63101", W 103° 35' 19.23088"
Location Grid N/E Y/X: N 404513.510 ftUS, E 771899.710 ftUS
CRS Grid Convergence Angle: 0.3958 °
Grid Scale Factor: 0.99996998
Version / Patch: 2.10.824.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 359.633 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: RKB
TVD Reference Elevation: 3421.800 ft above MSL
Seabed / Ground Elevation: 3398.800 ft above MSL
Magnetic Declination: 6.454 °
Total Gravity Field Strength: 998.4330mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47599.226 nT
Magnetic Dip Angle: 59.677 °
Declination Date: February 09, 2021
Magnetic Declination Model: HDGM 2020
North Reference: Grid North
Grid Convergence Used: 0.3958 °
Total Corr Mag North->Grid North: 6.0578 °

Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [390' FSL, 900' FEL] Nudge 27'100' DLS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
Hold Nudge	3000.00	0.00	220.97	3000.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
Drop to Vertical	3350.00	7.00	220.97	3349.13	-16.03	-16.12	-14.00	2.00	404497.39	771885.71	N 32 6 35.47	W 103 35 19.39
2°/100' DLS	4739.42	7.00	220.97	4728.20	-143.18	-143.99	-125.01	0.00	404369.53	771774.70	N 32 6 34.21	W 103 35 20.70
Hold Vertical	5089.42	0.00	220.97	5077.33	-159.22	-160.11	-139.01	2.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
KOP - Build	11827.09	0.00	220.97	11815.00	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
12°/100' DLS	12452.09	75.00	359.63	12276.19	194.67	193.77	-141.27	12.00	404707.27	771758.44	N 32 6 37.56	W 103 35 20.86
Build 4°/100'	12827.09	90.00	359.63	12325.00	565.40	564.49	-143.64	4.00	405077.99	771756.07	N 32 6 41.23	W 103 35 20.86
Landing Point												
Cimarex Vaca												
Draw 20-17												
Federal #58H -												
PBHL [100' FNL, 1040' FEL]	22332.02	90.00	359.63	12325.00	10070.33	10069.22	-204.43	0.00	414582.41	771695.29	N 32 8 15.28	W 103 35 20.80

Survey Type: Def Plan

Survey Error Model: ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Drilling Office 2.10.824.0

...Vaca Draw 20-17 Federal #58H\Cimarex Vaca Draw 20-17 Federal #58H Rev1 RM 09Feb21

2/18/2021 11:20 AM Page 1 of 2

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Survey Program:												
Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey			
	1	0.000	23.000	1/100.000	17.500	13.375		NAL_MWD_IFR1+MS-Depth Only	Vaca Draw 20-17 Federal #58H / Cimarex Vaca Draw 20-17 Federal #58H Rev1 RM 09Feb21			
	1	23.000	22332.016	1/100.000	17.500	13.375		NAL_MWD_IFR1+MS	Vaca Draw 20-17 Federal #58H / Cimarex Vaca Draw 20-17			

Schlumberger**Cimarex Vaca Draw 20-17 Federal #58H Rev1 RM 09Feb21 Proposal****Geodetic Report**

(Def Plan)



Report Date: February 09, 2021 - 12:41 PM

Client: Cimarex Energy

Field: NM Lea County (NAD 83)

Structure / Slot: Cimarex Vaca Draw 20-17 Federal #58H / New Slot

Well: Vaca Draw 20-17 Federal #58H

Borehole: Unknown / Unknown

UWI / API#: Cimarex Vaca Draw 20-17 Federal #58H Rev1 RM 09Feb21

Survey Name: September 24, 2018

Survey Date: 104,000' / 10441.577 ft / 6.294 / 0.847

Tort / AHD / DDI / ERD Ratio: NAD83 New Mexico State Plane, Eastern Zone, US Feet

Coordinate Reference System: N 32° 6' 35.63101", W 103° 35' 19.23088"

Location Lat / Long: N 404513.510 ftUS, E 771899.710 ftUS

Location Grid N/E Y/X: 0.3958°

CRS Grid Convergence Angle: 0.9996998

Grid Scale Factor: 2.10.824.0

Version / Patch:

Survey / DLS Computation: Minimum Curvature / Lubinski

Vertical Section Azimuth: 359.633° (Grid North)

Vertical Section Origin: 0.000 ft, 0.000 ft

TVD Reference Datum: RKB

TVD Reference Elevation: 3421.800 ft above MSL

Seabed / Ground Elevation: 3398.800 ft above MSL

Magnetic Declination: 6.454°

Total Gravity Field Strength: 998.4330mgn (9.80665 Based)

Gravity Model: GARM

Total Magnetic Field Strength: 47599.226 nT

Magnetic Dip Angle: 59.677°

Declination Date: February 09, 2021

Magnetic Declination Model: HDGM 2020

North Reference: Grid North

Grid Convergence Used: 0.3958°

Total Corr Mag North->Grid North: 6.0578°

Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
SHL [390' FSL, 900' FEL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	100.00	0.00	220.97	100.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	200.00	0.00	220.97	200.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	300.00	0.00	220.97	300.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	400.00	0.00	220.97	400.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	500.00	0.00	220.97	500.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	600.00	0.00	220.97	600.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	700.00	0.00	220.97	700.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	800.00	0.00	220.97	800.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	900.00	0.00	220.97	900.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	1000.00	0.00	220.97	1000.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	1100.00	0.00	220.97	1100.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	1200.00	0.00	220.97	1200.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	1300.00	0.00	220.97	1300.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	1400.00	0.00	220.97	1400.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	1500.00	0.00	220.97	1500.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	1600.00	0.00	220.97	1600.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	1700.00	0.00	220.97	1700.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	1800.00	0.00	220.97	1800.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	1900.00	0.00	220.97	1900.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	2000.00	0.00	220.97	2000.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	2100.00	0.00	220.97	2100.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	2200.00	0.00	220.97	2200.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	2300.00	0.00	220.97	2300.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	2400.00	0.00	220.97	2400.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Nudge 2°/100' DLS	2500.00	0.00	220.97	2500.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	2600.00	0.00	220.97	2600.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	2700.00	0.00	220.97	2700.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	2800.00	0.00	220.97	2800.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	2900.00	0.00	220.97	2900.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
Hold Nudge	3000.00	0.00	220.97	3000.00	0.00	0.00	0.00	0.00	404513.51	771899.71	N 32 6 35.63	W 103 35 19.23
	3100.00	2.00	220.97	3099.98	-1.31	-1.32	-1.14	2.00	404512.19	771898.57	N 32 6 35.62	W 103 35 19.24
	3200.00	4.00	220.97	3199.84	-5.24	-5.27	-4.58	2.00	404508.24	771895.14	N 32 6 35.58	W 103 35 19.28
	3300.00	6.00	220.97	3299.45	-11.78	-11.85	-10.29	2.00	404501.66	771889.42	N 32 6 35.51	W 103 35 19.35
	3350.00	7.00	220.97	3349.13	-16.03	-16.12	-14.00	2.00	404497.39	771885.71	N 32 6 35.47	W 103 35 19.39
	3400.00	7.00	220.97	3398.76	-20.61	-20.73	-17.99	0.00	404492.79	771881.72	N 32 6 35.43	W 103 35 19.44
	3500.00	7.00	220.97	3498.01	-29.76	-29.93	-25.98	0.00	404483.58	771873.73	N 32 6 35.34	W 103 35 19.54
	3600.00	7.00	220.97	3597.27	-38.91	-39.13	-33.97	0.00	404474.38	771865.74	N 32 6 35.25	W 103 35 19.63
	3700.00	7.00	220.97	3696.52	-48.06	-48.33	-41.96	0.00	404465.18	771857.75	N 32 6 35.16	W 103 35 19.72
	3800.00	7.00	220.97	3795.78	-57.21	-57.54	-49.95	0.00	404455.98	771849.76	N 32 6 35.07	W 103 35 19.82
Drop to Vertical 2°/100' DLS	3900.00	7.00	220.97	3895.03	-66.37	-66.74	-57.94	0.00	404446.77	771841.77	N 32 6 34.97	W 103 35 19.91
	4000.00	7.00	220.97	3994.28	-75.52	-75.94	-65.93	0.00	404437.57	771833.78	N 32 6 34.88	W 103 35 20.00
	4100.00	7.00	220.97	4093.54	-84.67	-85.14	-73.92	0.00	404428.37	771825.79	N 32 6 34.79	W 103 35 20.10
	4200.00	7.00	220.97	4192.79	-93.82	-94.35	-81.91	0.00	404419.17	771817.80	N 32 6 34.70	W 103 35 20.19
	4300.00	7.00	220.97	4292.05	-102.97	-103.55	-89.90	0.00	404409.97	771809.81	N 32 6 34.61	W 103 35 20.28
	4400.00	7.00	220.97	4391.30	-112.12	-112.75	-97.89	0.00	404400.76	771801.82	N 32 6 34.52	W 103 35 20.38
	4500.00	7.00	220.97	4490.56	-121.27	-121.95	-105.88	0.00	404391.56	771793.83	N 32 6 34.43	W 103 35 20.47
	4600.00	7.00	220.97	4589.81	-130.42	-131.16	-113.87	0.00	404382.36	771785.84	N 32 6 34.34	W 103 35 20.57
	4700.00	7.00	220.97	4689.07	-139.57	-140.36	-121.86	0.00	404373.16	771777.85	N 32 6 34.25	W 103 35 20.66
	4739.42	7.00	220.97	4728.20	-143.18	-143.99	-125.01	0.00	404369.53	771774.70	N 32 6 34.21	W 103 35 20.70
Hold Vertical	4800.00	5.79	220.97	4788.40	-148.25	-149.08	-129.43	2.00	404364.44	771770.28	N 32 6 34.16	W 103 35 20.75
	4900.00	3.79	220.97	4888.04	-154.52	-155.38	-134.91	2.00	404358.13	771764.81	N 32 6 34.10	W 103 35 20.81
	5000.00	1.79	220.97	4987.92	-158.17	-159.06	-138.10	2.00	404354.46	771761.62	N 32 6 34.07	W 103 35 20.85
	5089.42	0.00	220.97	5077.33	-159.22	-160.11	-139.01	2.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	5100.00	0.00	220.97	5087.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	5200.00	0.00	220.97	5187.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	5300.00	0.00	220.97	5287.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	5400.00	0.00	220.97	5387.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	5500.00	0.00	220.97	5487.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	5600.00	0.00	220.97	5587.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	5700.00	0.00	220.97	5687.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	5800.00	0.00	220.97	5787.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	5900.00	0.00	220.97	5887.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	6000.00	0.00	220.97	5987.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	6100.00	0.00	220.97	6087.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	6200.00	0.00	220.97	6187.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	6300.00	0.00	220.97	6287.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	6400.00	0.00	220.97	6387.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	6500.00	0.00	220.97	6487.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	6600.00	0.00	220.97	6587.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	6700.00	0.00	220.97	6687.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	6800.00	0.00	220.97	6787.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	6900.00	0.00	220.97	6887.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	7000.00	0.00	220.97	6987.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	7100.00	0.00	220.97	7087.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	7200.00	0.00	220.97	7187.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	7300.00	0.00	220.97	7287.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	7400.00	0.00	220.97	7387.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	7500.00	0.00	220.97	7487.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
KOP - Build 12°/100' DLS	7600.00	0.00	220.97	7587.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	7700.00	0.00	220.97	7687.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	7800.00	0.00	220.97	7787.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	7900.00	0.00	220.97	7887.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	8000.00	0.00	220.97	7987.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	8100.00	0.00	220.97	8087.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	8200.00	0.00	220.97	8187.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	8300.00	0.00	220.97	8287.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	8400.00	0.00	220.97	8387.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	8500.00	0.00	220.97	8487.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	8600.00	0.00	220.97	8587.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	8700.00	0.00	220.97	8687.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	8800.00	0.00	220.97	8787.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	8900.00	0.00	220.97	8887.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	9000.00	0.00	220.97	8987.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	9100.00	0.00	220.97	9087.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	9200.00	0.00	220.97	9187.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	9300.00	0.00	220.97	9287.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	9400.00	0.00	220.97	9387.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	9500.00	0.00	220.97	9487.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	9600.00	0.00	220.97	9587.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	9700.00	0.00	220.97	9687.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	9800.00	0.00	220.97	9787.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	9900.00	0.00	220.97	9887.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	10000.00	0.00	220.97	9987.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	10100.00	0.00	220.97	10087.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	10200.00	0.00	220.97	10187.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	10300.00	0.00	220.97	10287.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	10400.00	0.00	220.97	10387.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	10500.00	0.00	220.97	10487.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	10600.00	0.00	220.97	10587.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	10700.00	0.00	220.97	10687.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	10800.00	0.00	220.97	10787.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	10900.00	0.00	220.97	10887.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	11000.00	0.00	220.97	10987.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	11100.00	0.00	220.97	11087.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	11200.00	0.00	220.97	11187.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	11300.00	0.00	220.97	11287.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	11400.00	0.00	220.97	11387.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	11500.00	0.00	220.97	11487.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	11600.00	0.00	220.97	11587.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	11700.00	0.00	220.97	11687.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	11800.00	0.00	220.97	11787.90	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
FTP [390' FSL, 1040' FEL]	11827.09	0.00	220.97	11815.00	-159.22	-160.11	-139.01	0.00	404353.41	771760.70	N 32 6 34.06	W 103 35 20.86
	11900.00	8.75	359.63	11887.62	-153.66	-154.55	-139.05	12.00	404358.96	771760.67	N 32 6 34.11	W 103 35 20.86
	12000.00	20.75	359.63	11984.15	-128.25	-129.14	-139.21	12.00	404384.37	771760.51	N 32 6 34.36	W 103 35 20.86
	12100.00	32.75	359.63	12073.28	-83.32	-84.22	-139.50	12.00	404429.29	771760.22	N 32 6 34.81	W 103 35 20.86
Build 4°/100' DLS	12200.00	44.75	359.63	12151.13	-20.85	-21.74	-139.89	12.00	404491.77	771759.82	N 32 6 35.43	W 103 35 20.86
	12228.87	48.21	359.63	12171.01	0.08	-0.81	-140.03	12.00	404512.70	771759.69	N 32 6 35.63	W 103 35 20.86
	12300.00	56.75	359.63	12214.29	56.45	55.55	-140.39	12.00	404569.06	771759.33	N 32 6 36.19	W 103 35 20.86
	12400.00	68.75	359.63	12259.99	145.19	144.29	-140.96	12.00	404657.79	771758.76	N 32 6 37.07	W 103 35 20.86
	12452.09	75.00	359.63	12276.19	194.67	193.77	-141.27	12.00	404707.27	771758.44	N 32 6 37.56	W 103 35 20.86
	12500.00	76.92	359.63	12287.82	241.14	240.24	-141.57	4.00	404753.74	771758.14	N 32 6 38.02	W 103 35 20.86

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
Penetration Point [955' FSL, 1040' FEL] Landing Point	12600.00	80.92	359.63	12307.04	339.26	338.36	-142.20	4.00	404851.85	771757.52	N 32° 6' 38.99"	W 103° 35' 20.86"
	12700.00	84.92	359.63	12319.37	438.48	537.57	-142.83	4.00	404951.07	771756.88	N 32° 6' 39.97"	W 103° 35' 20.86"
	12800.00	88.92	359.63	12324.74	538.31	537.40	-143.47	4.00	405050.90	771756.24	N 32° 6' 40.96"	W 103° 35' 20.86"
	12827.09	90.00	359.63	12325.00	565.40	564.49	-143.64	4.00	405077.99	771756.07	N 32° 6' 41.23"	W 103° 35' 20.86"
	12900.00	90.00	359.63	12325.00	638.31	637.40	-144.11	0.00	405150.89	771755.60	N 32° 6' 41.95"	W 103° 35' 20.86"
	13000.00	90.00	359.63	12325.00	738.31	737.40	-144.75	0.00	405250.88	771754.97	N 32° 6' 42.94"	W 103° 35' 20.85"
	13100.00	90.00	359.63	12325.00	838.31	837.40	-145.39	0.00	405350.88	771754.33	N 32° 6' 43.93"	W 103° 35' 20.85"
	13200.00	90.00	359.63	12325.00	938.31	937.39	-146.03	0.00	405450.87	771753.69	N 32° 6' 44.92"	W 103° 35' 20.85"
	13300.00	90.00	359.63	12325.00	1038.31	1037.39	-146.67	0.00	405550.87	771753.05	N 32° 6' 45.91"	W 103° 35' 20.85"
	13400.00	90.00	359.63	12325.00	1138.31	1137.39	-147.31	0.00	405650.86	771752.41	N 32° 6' 46.90"	W 103° 35' 20.85"
	13500.00	90.00	359.63	12325.00	1238.31	1237.39	-147.95	0.00	405750.86	771751.77	N 32° 6' 47.89"	W 103° 35' 20.85"
	13600.00	90.00	359.63	12325.00	1338.31	1337.38	-148.59	0.00	405850.85	771751.13	N 32° 6' 48.87"	W 103° 35' 20.85"
	13700.00	90.00	359.63	12325.00	1438.31	1437.38	-149.23	0.00	405950.85	771750.49	N 32° 6' 49.86"	W 103° 35' 20.85"
	13800.00	90.00	359.63	12325.00	1538.31	1537.38	-149.87	0.00	406050.84	771749.85	N 32° 6' 50.85"	W 103° 35' 20.85"
	13900.00	90.00	359.63	12325.00	1638.31	1637.38	-150.50	0.00	406150.84	771749.21	N 32° 6' 51.84"	W 103° 35' 20.85"
	14000.00	90.00	359.63	12325.00	1738.31	1737.38	-151.14	0.00	406250.83	771748.57	N 32° 6' 52.83"	W 103° 35' 20.85"
	14100.00	90.00	359.63	12325.00	1838.31	1837.37	-151.78	0.00	406350.83	771747.93	N 32° 6' 53.82"	W 103° 35' 20.85"
	14200.00	90.00	359.63	12325.00	1938.31	1937.37	-152.42	0.00	406450.82	771747.29	N 32° 6' 54.81"	W 103° 35' 20.85"
	14300.00	90.00	359.63	12325.00	2038.31	2037.37	-153.06	0.00	406550.82	771746.65	N 32° 6' 55.80"	W 103° 35' 20.85"
	14400.00	90.00	359.63	12325.00	2138.31	2137.37	-153.70	0.00	406650.81	771746.01	N 32° 6' 56.79"	W 103° 35' 20.85"
	14500.00	90.00	359.63	12325.00	2238.31	2237.37	-154.34	0.00	406750.80	771745.37	N 32° 6' 57.78"	W 103° 35' 20.85"
	14600.00	90.00	359.63	12325.00	2338.31	2337.36	-154.98	0.00	406850.80	771744.73	N 32° 6' 58.77"	W 103° 35' 20.85"
	14700.00	90.00	359.63	12325.00	2437.36	2437.36	-155.62	0.00	406950.79	771744.09	N 32° 6' 59.76"	W 103° 35' 20.84"
	14800.00	90.00	359.63	12325.00	2538.31	2537.36	-156.26	0.00	407050.79	771743.45	N 32° 7' 0' 75"	W 103° 35' 20.84"
	14900.00	90.00	359.63	12325.00	2638.31	2637.36	-156.90	0.00	407150.78	771742.82	N 32° 7' 1' 74"	W 103° 35' 20.84"
	15000.00	90.00	359.63	12325.00	2738.31	2737.36	-157.54	0.00	407250.78	771742.18	N 32° 7' 2' 73"	W 103° 35' 20.84"
	15100.00	90.00	359.63	12325.00	2838.31	2837.35	-158.18	0.00	407350.77	771741.54	N 32° 7' 3' 72"	W 103° 35' 20.84"
	15200.00	90.00	359.63	12325.00	2938.31	2937.35	-158.82	0.00	407450.77	771740.90	N 32° 7' 4' 71"	W 103° 35' 20.84"
	15300.00	90.00	359.63	12325.00	3038.31	3037.35	-159.46	0.00	407550.76	771740.26	N 32° 7' 5' 70"	W 103° 35' 20.84"
	15400.00	90.00	359.63	12325.00	3138.31	3137.35	-160.10	0.00	407650.75	771739.62	N 32° 7' 6' 69"	W 103° 35' 20.84"
	15500.00	90.00	359.63	12325.00	3238.31	3237.35	-160.74	0.00	407750.75	771738.98	N 32° 7' 7' 68"	W 103° 35' 20.84"
	15600.00	90.00	359.63	12325.00	3338.31	3337.34	-161.38	0.00	407850.75	771738.34	N 32° 7' 8' 67"	W 103° 35' 20.84"
	15700.00	90.00	359.63	12325.00	3438.31	3437.34	-162.02	0.00	407950.74	771737.70	N 32° 7' 9' 66"	W 103° 35' 20.84"
	15800.00	90.00	359.63	12325.00	3538.31	3537.34	-162.66	0.00	408050.74	771737.06	N 32° 7' 10' 64"	W 103° 35' 20.84"
	15900.00	90.00	359.63	12325.00	3638.31	3637.34	-163.29	0.00	408150.73	771736.42	N 32° 7' 11' 63"	W 103° 35' 20.84"
	16000.00	90.00	359.63	12325.00	3738.31	3737.34	-163.93	0.00	408250.73	771735.78	N 32° 7' 12' 62"	W 103° 35' 20.84"
	16100.00	90.00	359.63	12325.00	3838.31	3837.33	-164.57	0.00	408350.72	771735.14	N 32° 7' 13' 61"	W 103° 35' 20.84"
	16200.00	90.00	359.63	12325.00	3938.31	3937.33	-165.21	0.00	408450.72	771734.50	N 32° 7' 14' 60"	W 103° 35' 20.84"
	16300.00	90.00	359.63	12325.00	4038.31	4037.33	-165.85	0.00	408550.71	771733.86	N 32° 7' 15' 59"	W 103° 35' 20.83"
	16400.00	90.00	359.63	12325.00	4138.31	4137.33	-166.49	0.00	408650.71	771733.22	N 32° 7' 16' 58"	W 103° 35' 20.83"
	16500.00	90.00	359.63	12325.00	4238.31	4237.33	-167.13	0.00	408750.70	771732.58	N 32° 7' 17' 57"	W 103° 35' 20.83"
	16600.00	90.00	359.63	12325.00	4338.31	4337.32	-167.77	0.00	408850.69	771731.94	N 32° 7' 18' 56"	W 103° 35' 20.83"
	16700.00	90.00	359.63	12325.00	4438.31	4437.32	-168.41	0.00	408950.69	771731.30	N 32° 7' 19' 55"	W 103° 35' 20.83"
	16800.00	90.00	359.63	12325.00	4538.31	4537.32	-169.05	0.00	409050.68	771730.67	N 32° 7' 20' 54"	W 103° 35' 20.83"
	16900.00	90.00	359.63	12325.00	4638.31	4637.32	-169.69	0.00	409150.68	771730.03	N 32° 7' 21' 53"	W 103° 35' 20.83"
	17000.00	90.00	359.63	12325.00	4738.31	4737.32	-170.33	0.00	409250.67	771729.39	N 32° 7' 22' 52"	W 103° 35' 20.83"
	17100.00	90.00	359.63	12325.00	4838.31	4837.31	-170.97	0.00	409350.67	771728.75	N 32° 7' 23' 51"	W 103° 35' 20.83"
	17200.00	90.00	359.63	12325.00	4938.31	4937.31	-171.61	0.00	409450.66	771728.11	N 32° 7' 24' 50"	W 103° 35' 20.83"
	17300.00	90.00	359.63	12325.00	5038.31	5037.31	-172.25	0.00	409550.66	771727.47	N 32° 7' 25' 49"	W 103° 35' 20.83"
	17400.00	90.00	359.63	12325.00	5138.31	5137.31	-172.89	0.00	409650.65	771726.83	N 32° 7' 26' 48"	W 103° 35' 20.83"
	17500.00	90.00	359.63	12325.00	5238.31	5237.31	-173.53	0.00	409750.65	771726.19	N 32° 7' 27' 47"	W 103° 35' 20.83"
	17600.00	90.00	359.63	12325.00	5338.31	5337.30	-174.17	0.00	409850.64	771725.55	N 32° 7' 28' 46"	W 103° 35' 20.83"
	17700.00	90.00	359.63	12325.00	5438.31	5437.30	-174.81	0.00	409950.64	771724.91	N 32° 7' 29' 45"	W 103° 35' 20.83"

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
	17800.00	90.00	359.63	12325.00	5538.31	5537.30	-175.44	0.00	410050.63	771724.27	N 32° 7' 30.43"	W 103° 35' 20.83"
	17900.00	90.00	359.63	12325.00	5638.31	5637.30	-176.08	0.00	410150.63	771723.63	N 32° 7' 31.42"	W 103° 35' 20.83"
	18000.00	90.00	359.63	12325.00	5738.31	5737.29	-176.72	0.00	410250.62	771722.99	N 32° 7' 32.41"	W 103° 35' 20.82"
	18100.00	90.00	359.63	12325.00	5838.31	5837.29	-177.36	0.00	410350.62	771722.35	N 32° 7' 33.40"	W 103° 35' 20.82"
	18200.00	90.00	359.63	12325.00	5938.31	5937.29	-178.00	0.00	410450.61	771721.71	N 32° 7' 34.39"	W 103° 35' 20.82"
	18300.00	90.00	359.63	12325.00	6038.31	6037.29	-178.64	0.00	410550.61	771721.07	N 32° 7' 35.38"	W 103° 35' 20.82"
	18400.00	90.00	359.63	12325.00	6138.31	6137.29	-179.28	0.00	410650.60	771720.43	N 32° 7' 36.37"	W 103° 35' 20.82"
	18500.00	90.00	359.63	12325.00	6238.31	6237.28	-179.92	0.00	410750.59	771719.79	N 32° 7' 37.36"	W 103° 35' 20.82"
	18600.00	90.00	359.63	12325.00	6338.31	6337.28	-180.56	0.00	410850.59	771719.15	N 32° 7' 38.35"	W 103° 35' 20.82"
	18700.00	90.00	359.63	12325.00	6438.31	6437.28	-181.20	0.00	410950.58	771718.52	N 32° 7' 39.34"	W 103° 35' 20.82"
	18800.00	90.00	359.63	12325.00	6538.31	6537.28	-181.84	0.00	411050.58	771717.88	N 32° 7' 40.33"	W 103° 35' 20.82"
	18900.00	90.00	359.63	12325.00	6638.31	6637.28	-182.48	0.00	411150.57	771717.24	N 32° 7' 41.32"	W 103° 35' 20.82"
	19000.00	90.00	359.63	12325.00	6738.31	6737.27	-183.12	0.00	411250.57	771716.60	N 32° 7' 42.31"	W 103° 35' 20.82"
	19100.00	90.00	359.63	12325.00	6838.31	6837.27	-183.76	0.00	411350.56	771715.96	N 32° 7' 43.30"	W 103° 35' 20.82"
	19200.00	90.00	359.63	12325.00	6938.31	6937.27	-184.40	0.00	411450.56	771715.32	N 32° 7' 44.29"	W 103° 35' 20.82"
	19300.00	90.00	359.63	12325.00	7038.31	7037.27	-185.04	0.00	411550.55	771714.68	N 32° 7' 45.28"	W 103° 35' 20.82"
	19400.00	90.00	359.63	12325.00	7138.31	7137.27	-185.68	0.00	411650.55	771714.04	N 32° 7' 46.27"	W 103° 35' 20.82"
	19500.00	90.00	359.63	12325.00	7238.31	7237.26	-186.32	0.00	411750.54	771713.40	N 32° 7' 47.26"	W 103° 35' 20.82"
	19600.00	90.00	359.63	12325.00	7338.31	7337.26	-186.96	0.00	411850.54	771712.76	N 32° 7' 48.25"	W 103° 35' 20.82"
	19700.00	90.00	359.63	12325.00	7438.31	7437.26	-187.60	0.00	411950.53	771712.12	N 32° 7' 49.24"	W 103° 35' 20.81"
	19800.00	90.00	359.63	12325.00	7538.31	7537.26	-188.23	0.00	412050.53	771711.48	N 32° 7' 50.23"	W 103° 35' 20.81"
	19900.00	90.00	359.63	12325.00	7638.31	7637.26	-188.87	0.00	412150.52	771710.84	N 32° 7' 51.22"	W 103° 35' 20.81"
	20000.00	90.00	359.63	12325.00	7738.31	7737.25	-189.51	0.00	412250.52	771710.20	N 32° 7' 52.20"	W 103° 35' 20.81"
	20100.00	90.00	359.63	12325.00	7838.31	7837.25	-190.15	0.00	412350.51	771709.56	N 32° 7' 53.19"	W 103° 35' 20.81"
	20200.00	90.00	359.63	12325.00	7938.31	7937.25	-190.79	0.00	412450.51	771708.92	N 32° 7' 54.18"	W 103° 35' 20.81"
	20300.00	90.00	359.63	12325.00	8038.31	8037.25	-191.43	0.00	412550.50	771708.28	N 32° 7' 55.17"	W 103° 35' 20.81"
	20400.00	90.00	359.63	12325.00	8138.31	8137.25	-192.07	0.00	412650.50	771707.64	N 32° 7' 56.16"	W 103° 35' 20.81"
	20500.00	90.00	359.63	12325.00	8238.31	8237.24	-192.71	0.00	412750.49	771707.01	N 32° 7' 57.15"	W 103° 35' 20.81"
	20600.00	90.00	359.63	12325.00	8338.31	8337.24	-193.35	0.00	412850.48	771706.37	N 32° 7' 58.14"	W 103° 35' 20.81"
	20700.00	90.00	359.63	12325.00	8438.31	8437.24	-193.99	0.00	412950.48	771705.73	N 32° 7' 59.13"	W 103° 35' 20.81"
	20800.00	90.00	359.63	12325.00	8538.31	8537.24	-194.63	0.00	413050.47	771705.09	N 32° 8' 0' 12"	W 103° 35' 20.81"
	20900.00	90.00	359.63	12325.00	8638.31	8637.24	-195.27	0.00	413150.47	771704.45	N 32° 8' 1' 11"	W 103° 35' 20.81"
	21000.00	90.00	359.63	12325.00	8738.31	8737.23	-195.91	0.00	413250.46	771703.81	N 32° 8' 2' 10"	W 103° 35' 20.81"
	21100.00	90.00	359.63	12325.00	8838.31	8837.23	-196.55	0.00	413350.46	771703.17	N 32° 8' 3' 09"	W 103° 35' 20.81"
	21200.00	90.00	359.63	12325.00	8938.31	8937.23	-197.19	0.00	413450.45	771702.53	N 32° 8' 4' 08"	W 103° 35' 20.81"
	21300.00	90.00	359.63	12325.00	9038.31	9037.23	-197.83	0.00	413550.45	771701.89	N 32° 8' 5' 07"	W 103° 35' 20.81"
	21400.00	90.00	359.63	12325.00	9138.31	9137.23	-198.47	0.00	413650.44	771701.25	N 32° 8' 6' 06"	W 103° 35' 20.80"
	21500.00	90.00	359.63	12325.00	9238.31	9237.22	-199.11	0.00	413750.44	771700.61	N 32° 8' 7' 05"	W 103° 35' 20.80"
	21600.00	90.00	359.63	12325.00	9338.31	9337.22	-199.75	0.00	413850.43	771699.97	N 32° 8' 8' 04"	W 103° 35' 20.80"
	21700.00	90.00	359.63	12325.00	9438.31	9437.22	-200.38	0.00	413950.43	771699.33	N 32° 8' 9' 03"	W 103° 35' 20.80"
	21800.00	90.00	359.63	12325.00	9538.31	9537.22	-201.02	0.00	414050.42	771698.69	N 32° 8' 10' 02"	W 103° 35' 20.80"
	21900.00	90.00	359.63	12325.00	9638.31	9637.22	-201.66	0.00	414150.42	771698.05	N 32° 8' 11' 01"	W 103° 35' 20.80"
	22000.00	90.00	359.63	12325.00	9738.31	9737.21	-202.30	0.00	414250.41	771697.41	N 32° 8' 12' 00"	W 103° 35' 20.80"
	22100.00	90.00	359.63	12325.00	9838.31	9837.21	-202.94	0.00	414350.41	771696.77	N 32° 8' 12' 98"	W 103° 35' 20.80"
	22200.00	90.00	359.63	12325.00	9938.31	9937.21	-203.58	0.00	414450.40	771696.13	N 32° 8' 13' 97"	W 103° 35' 20.80"
	22300.00	90.00	359.63	12325.00	10038.31	10037.21	-204.22	0.00	414550.40	771695.49	N 32° 8' 14' 96"	W 103° 35' 20.80"
Cimarex Vaca Draw 20-17												
Federal #58H- PBHL [100' FNL, 1040' FEL]	22332.02	90.00	359.63	12325.00	10070.33	10069.22	-204.43	0.00	414582.41	771695.29	N 32° 8' 15' 28"	W 103° 35' 20.80"

Survey Type: Def Plan

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (ft)	EW (ft)	DLS (°/100ft)	Northing (ftUS)	Easting (ftUS)	Latitude (N/S ° ' ")	Longitude (E/W ° ' ")
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Survey Error Model: ISCVSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma

Survey Program:

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Expected Max Inclination (deg)	Survey Tool Type	Borehole / Survey
	1	0.000	23.000	1/100.000	17.500	13.375	NAL_MWD_IFR1+MS-Depth Only		Vaca Draw 20-17 Federal #58H / Cimarex Vaca Draw 20-17 Federal #58H Rev1 RM 09Feb21
	1	23.000	22332.016	1/100.000	17.500	13.375	NAL_MWD_IFR1+MS		Vaca Draw 20-17 Federal #58H / Cimarex Vaca Draw 20-17



Cimarex Vaca Draw 20-17 Federal #58H Rev1 RM 09Feb21 Anti-Collision Summary Report

Analysis Date-24hr Time: February 09, 2021 - 12:42

Client: Cimarex Energy

Field: NM Lea County (NAD 83)

Structure: Cimarex Vaca Draw 20-17 Federal #58H

Slot: New Slot

Well: Vaca Draw 20-17 Federal #58H

Borehole: Vaca Draw 20-17 Federal #58H

Scan MD Range: 0.00ft ~ 22332.02ft

Analysis Method:

Reference Trajectory:

Depth Interval: Every 10.00 Measured Depth (ft)

Rule Set: NAL Procedure: D&M AntiCollision Standard S002

Min Pts: All local minima indicated.

Version / Patch: 2.10.824.0

Database \ Project: US1455VSM3115\DRILLING-NM Lea County 2.10

3D Least Distance

Cimarex Vaca Draw 20-17 Federal #58H Rev1 RM 09Feb21 (Def Plan)

Every 10.00 Measured Depth (ft)

NAL Procedure: D&M AntiCollision Standard S002

All local minima indicated.

2.10.824.0

US1455VSM3115\DRILLING-NM Lea County 2.10

ISCWSA0 3-D 95.000% Confidence 2.7955 sigma, for subject well. For offset wells, error model version is specified with each well respectively.

Trajectory Error Model:

Offset Selection Criteria

Wellhead distance scan:

Selection filters:

Not performed!

Definitive Surveys - Definitive Plans - Definitive surveys exclude definitive plans

- All Non-Def Surveys when no Def-Survey is set in a borehole - All Non-Def Plans when no Def-Plan is set in a borehole

Offset Trajectories Summary

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Minor	Major		

Results highlighted: Sep-Factor separation <= 1.50 ft

Cimarex Vaca Draw 20-17
Federal #59H Rev1 RM
09Feb21 (Def Plan)

20.00	16.40	18.02	3.61	N/A	MAS = 5.00 (m)	0.00	0.00	0.00		Enter Alert	Fail Minor
20.00	16.40	18.02	3.60	N/A	MAS = 5.00 (m)	23.00	23.00	23.00		WRP	
20.00	20.06	5.97	-0.06	1.49	OSF1.50	1980.00	1980.00	OSF<1.50		Enter Minor	
20.00	24.96	2.70	-4.96	1.18	OSF1.50	2500.00	2500.00			MinPt-CtCt	
20.02	25.03	2.67	-5.01	1.17	OSF1.50	2510.00	2510.00			MINPT-O-EOU	
20.07	25.09	2.68	-5.03	1.17	OSF1.50	2520.00	2520.00			MinPts	
25.41	25.87	7.50	-0.46	1.47	OSF1.50	2680.00	2680.00	OSF>1.50		Exit Minor	
83.61	26.92	65.01	56.70	4.91	OSF1.50	3150.00	3149.93			Exit Alert	
664.22	38.77	637.71	625.44	27.00	OSF1.50	6510.00	6497.90			MinPt-O-SF	
685.07	78.96	631.77	606.11	13.31	OSF1.50	11940.00	11926.85			MINPT-O-EOU	
685.20	79.12	631.79	606.08	13.29	OSF1.50	11960.00	11946.19			MinPt-O-ADP	
692.27	80.69	637.82	611.58	13.15	OSF1.50	12170.00	12129.18			MinPt-O-SF	
712.17	84.11	655.43	628.05	12.97	OSF1.50	12827.09	12325.00			MinPt-CtCt	
712.17	215.11	568.11	497.06	5.00	OSF1.50	18040.00	12325.00	OSF<-5.00		Enter Alert	
712.18	348.13	479.43	364.05	3.08	OSF1.50	22332.02	12325.00			MinPts	

Cimarex Vaca Draw 20-17
Federal #57H Rev1 RM
09Feb21 (Def Plan)

20.05	16.30	18.77	3.76	N/A	MAS = 4.97 (m)	0.00	0.00	0.00		Enter Alert	Fail Minor
20.05	16.30	18.76	3.75	N/A	MAS = 4.97 (m)	23.00	23.00			WRP	
20.05	20.12	6.21	-0.07	1.49	OSF1.50	2060.00	2060.00	OSF<1.50		Enter Minor	

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor		
	20.08	24.27	3.44	-4.22	1.22	OSF1.50	2500.00	2500.00		MinPt-CtCt	
	20.07	24.34	3.41	-4.27	1.22	OSF1.50	2510.00	2510.00		MINPT-O-EOU	
	20.12	24.40	3.42	-4.29	1.22	OSF1.50	2520.00	2520.00		MinPts	
	24.97	25.19	7.74	-0.23	1.49	OSF1.50	2670.00	2670.00	OSF>1.50	Exit Minor	
	84.13	26.36	66.12	57.76	4.95	OSF1.50	3159.92	3159.92	OSF>5.00	Exit Alert	
	683.92	77.86	631.58	606.06	13.37	OSF1.50	11877.72	11877.72		MinPt-CtCt	
	684.01	78.31	631.38	605.70	13.30	OSF1.50	11936.55	11936.55		MINPT-O-EOU	
	684.13	78.46	631.36	605.67	13.27	OSF1.50	11955.78	11955.78		MinPt-O-ADP	
	688.92	79.59	635.43	609.33	13.17	OSF1.50	12105.98	12105.98		MinPt-O-SF	
	711.25	214.46	567.85	496.79	5.00	OSF1.50	18160.00	12325.00	OSF<5.00	Enter Alert	
	711.25	343.84	481.59	367.40	3.11	OSF1.50	22330.00	12325.00		MinPt-CtCt	
	711.25	343.91	481.54	367.34	3.11	OSF1.50	22332.02	12325.00		MinPts	

EOG Vaca Draw 20 Federal #1
(Offset) Plugged Inc Only 0ft-
14200ft (Def Survey)

	3326.69	32.81	3324.71	3293.88	N/A	MAS = 10.00 (m)	0.00	0.00		Surface	Fail Minor
	3326.68	32.81	3324.28	3293.87	7867.70	MAS = 10.00 (m)	23.00	23.00		WRP	
	3324.46	32.81	3305.88	3291.65	200.07	MAS = 10.00 (m)	540.00	540.00		MinPts	
	3328.67	128.63	3242.26	3200.04	39.40	OSF1.50	2500.00	2500.00		MinPt-CtCt	
	3334.14	156.86	3228.91	3177.28	32.27	OSF1.50	3080.00	3079.99		MINPT-O-EOU	
	3341.78	165.98	3230.46	3175.79	30.55	OSF1.50	3240.00	3239.72		MinPt-O-ADP	
	3391.18	208.96	3251.22	3182.23	24.56	OSF1.50	3990.00	3984.36		MinPt-O-ADP	
	3455.23	371.12	3207.16	3084.11	14.03	OSF1.50	7200.00	7187.90		MinPt-CtCt	
	3453.71	430.52	3166.04	3023.19	12.08	OSF1.50	8340.00	8327.90		MinPt-CtCt	
	3445.60	549.02	3078.93	2896.58	9.44	OSF1.50	10600.00	10587.90		MinPt-CtCt	
	3449.43	561.45	3074.47	2887.98	9.24	OSF1.50	10920.00	10907.90		MINPT-O-EOU	
	2126.54	641.58	1697.33	1484.96	5.00	OSF1.50	13450.00	12325.00	OSF<5.00	Enter Alert	
	644.28	646.07	212.30	-1.79	1.50	OSF1.50	15290.00	12325.00	OSF<1.50	Enter Minor	
	613.74	645.66	182.58	-31.92	1.43	OSF1.50	15480.00	12325.00		MinPts	
	613.72	645.60	182.63	-31.89	1.43	OSF1.50	15490.00	12325.00		MinPt-CtCt	
	643.59	645.78	212.42	-2.18	1.49	OSF1.50	15680.00	12325.00	OSF>1.50	Exit Minor	
	2133.92	642.40	1704.99	1491.52	4.99	OSF1.50	17530.00	12325.00	OSF>5.00	Exit Alert	
	6872.90	645.45	6441.94	6227.45	16.02	OSF1.50	22332.02	12325.00		TD	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #71H
MWD 0ft-19978ft (Surcon
Corrected) (Def Survey)

	529.87	32.81	528.59	497.07	N/A	MAS = 10.00 (m)	0.00	0.00		MinPts	Warning Alert
	529.88	32.81	528.59	497.07	134583.15	MAS = 10.00 (m)	23.00	23.00		WRP	
	530.02	32.81	528.53	497.21	2580.49	MAS = 10.00 (m)	90.00	90.00		MINPT-O-EOU	
	530.22	32.81	528.50	497.41	1233.32	MAS = 10.00 (m)	140.00	140.00		MINPT-O-EOU	
	526.99	32.81	520.76	494.18	106.33	MAS = 10.00 (m)	1060.00	1060.00		MINPT-O-EOU	
	444.33	32.81	428.61	411.52	30.48	MAS = 10.00 (m)	3100.00	3099.98		MinPt-O-SF	
	443.26	32.81	427.78	410.45	30.92	MAS = 10.00 (m)	3179.88	3179.88		MINPT-O-EOU	
	443.26	32.81	427.81	410.45	30.98	MAS = 10.00 (m)	3189.86	3189.86		MinPts	
	637.72	32.81	625.58	604.91	57.23	MAS = 10.00 (m)	5000.00	4987.92		MinPt-O-SF	
	147.89	45.47	117.13	102.42	4.98	OSF1.50	9390.00	9377.90	OSF<5.00	Enter Alert	
	137.96	47.06	106.17	90.90	4.48	OSF1.50	9620.00	9607.90		MinPts	
	138.09	47.13	106.26	90.96	4.47	OSF1.50	9630.00	9617.90		MinPt-O-SF	
	153.99	46.94	122.35	107.05	5.00	OSF1.50	9737.90	9737.90	OSF>5.00	Exit Alert	
	2309.36	33.53	2286.68	2275.83	106.39	OSF1.50	13080.00	12325.00		MinPt-CtCt	
	2272.62	67.63	2227.20	2204.98	51.13	OSF1.50	14440.00	12325.00		MinPt-CtCt	

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor	Major	
	2273.13	69.26	2226.63	49.92	OSF1.50	14520.00	12325.00			MINPT-O-EOU	
	2278.72	80.34	2224.83	43.05	OSF1.50	14920.00	12325.00			MINPT-O-EOU	
	2282.78	144.45	2166.15	23.65	OSF1.50	17080.00	12325.00			MinPt-CtCt	
	2265.15	176.56	2147.11	19.34	OSF1.50	18160.00	12325.00			MinPt-CtCt	
	2285.61	178.01	2146.61	19.19	OSF1.50	18230.00	12325.00			MINPT-O-EOU	
	2266.30	178.82	2146.75	19.11	OSF1.50	18270.00	12325.00			MinPt-O-ADP	
	2268.40	185.52	2144.39	18.43	OSF1.50	18460.00	12325.00			MinPt-CtCt	
	2268.41	195.65	2137.65	17.47	OSF1.50	18800.00	12325.00			MinPt-CtCt	
	2269.74	217.78	2124.22	15.70	OSF1.50	19540.00	12325.00			MinPt-CtCt	
	2277.00	249.82	2110.13	13.72	OSF1.50	20610.00	12325.00			MinPt-CtCt	
	2278.79	266.61	2100.73	12.86	OSF1.50	21170.00	12325.00			MinPt-CtCt	
	2289.02	300.84	2088.13	11.45	OSF1.50	22332.02	12325.00			MinPis	

Hankamer Curtis Bass-Federal
#1 (Offset) Plugged Blind Off-
5074ft (Def Survey)

4367.51	32.81	4364.57	4334.71	4529.31	MAS = 10.00 (m)	0.00	0.00			Surface	Warning Alert
4367.51	32.81	4362.16	4334.71	1294.09	MAS = 10.00 (m)	23.00	23.00			WRP	
4367.51	932.50	3745.19	3435.02	7.04	OSF1.50	3000.00	3000.00			MinPt-CtCt	
4445.81	1335.34	3554.92	3110.47	5.00	OSF1.50	4290.00	4282.12	OSF<5.00		Enter Alert	
4490.86	1581.32	3435.99	2909.54	4.26	OSF1.50	5080.00	5067.90			MinPis	
4862.00	1460.92	3887.40	3401.09	5.00	OSF1.50	6940.00	6927.90	OSF>5.00		Exit Alert	
7399.89	316.90	7187.96	7082.99	35.24	OSF1.50	15410.00	12325.00			MinPt-O-ADP	
7319.85	225.58	7168.81	7094.27	49.09	OSF1.50	16500.00	12325.00			MinPt-CtCt	
7332.15	246.54	7167.13	7085.61	44.96	OSF1.50	16920.00	12325.00			MINPT-O-EOU	
7408.79	338.12	7182.72	7070.68	33.05	OSF1.50	17640.00	12325.00			MinPt-O-ADP	
9361.93	1013.12	8685.85	8348.80	13.89	OSF1.50	22332.02	12325.00			MinPt-O-SF	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #45H Off-
19226ft (Surcon Corrected)
(Def Survey)

1199.89	32.81	1198.60	1167.08	N/A	MAS = 10.00 (m)	0.00	0.00			MinPis	Pass
1199.90	32.81	1198.60	1167.09	69127.44	MAS = 10.00 (m)	23.00	23.00			WRP	
1200.04	32.81	1198.54	1167.23	5478.92	MAS = 10.00 (m)	90.00	90.00			MINPT-O-EOU	
1200.29	32.81	1198.51	1167.48	2458.03	MAS = 10.00 (m)	150.00	150.00			MINPT-O-EOU	
1195.79	32.81	1190.14	1162.98	273.76	MAS = 10.00 (m)	1040.00	1040.00			MINPT-O-EOU	
1016.49	32.81	1001.59	983.68	74.36	MAS = 10.00 (m)	3100.00	3099.98			MinPt-O-SF	
970.09	32.81	955.68	937.28	73.83	MAS = 10.00 (m)	3340.00	3339.20			MinPt-O-SF	
240.41	39.36	213.52	201.05	9.56	OSF1.50	8150.00	8137.90			MinPt-CtCt	
238.89	42.84	209.68	196.05	8.69	OSF1.50	8750.00	8737.90			MinPt-CtCt	
238.93	42.96	209.64	195.97	8.67	OSF1.50	8770.00	8757.90			MINPT-O-EOU	
239.03	43.08	209.66	195.95	8.65	OSF1.50	8790.00	8777.90			MinPt-O-ADP	
239.75	43.33	210.21	196.42	8.62	OSF1.50	8830.00	8817.90			MinPt-O-SF	
2941.25	137.37	2849.32	2803.87	32.35	OSF1.50	16690.00	12325.00			MinPt-CtCt	
2941.94	139.48	2848.61	2802.46	31.86	OSF1.50	16790.00	12325.00			MINPT-O-EOU	
2943.02	140.77	2848.83	2802.24	31.58	OSF1.50	16850.00	12325.00			MinPt-O-ADP	
2956.38	155.23	2852.55	2801.15	28.75	OSF1.50	17330.00	12325.00			MINPT-O-EOU	
2957.69	156.69	2852.88	2800.99	28.49	OSF1.50	17390.00	12325.00			MinPt-O-ADP	
2975.80	194.50	2845.79	2781.30	23.06	OSF1.50	18610.00	12325.00			MinPt-CtCt	
2976.27	195.85	2845.36	2780.42	22.91	OSF1.50	18680.00	12325.00			MINPT-O-EOU	
2976.92	196.61	2845.51	2780.31	22.82	OSF1.50	18720.00	12325.00			MinPt-O-ADP	
2979.33	207.12	2840.91	2772.21	21.68	OSF1.50	19030.00	12325.00			MinPt-CtCt	
2977.66	213.12	2835.24	2764.54	21.05	OSF1.50	19230.00	12325.00			MinPt-CtCt	

Offset Trajectory		Separation			Allow Dev. (ft)	Sep. Fact.	Controlling		Reference Trajectory		Risk Level		Alert	Status
Ct-Ct (ft)	MAS (ft)	EOU (ft)		Rule			MD (ft)	TVD (ft)	Alert	Minor	Major			
2979.36	216.81	2834.48		2762.55	20.70	OSF1.50	19390.00	12325.00					MINPT-O-EOU	
2980.29	218.19	2834.49		2762.10	20.58	OSF1.50	19440.00	12325.00					MINPT-O-EOU	
2985.61	227.73	2833.45		2757.88	19.75	OSF1.50	19750.00	12325.00					MINPT-O-EOU	
2986.52	228.85	2833.61		2757.67	19.66	OSF1.50	19800.00	12325.00					MinPt-O-ADP	
2952.21	264.35	2775.63		2687.85	16.81	OSF1.50	20940.00	12325.00					MinPt-CtCt	
2953.28	267.31	2774.73		2685.96	16.63	OSF1.50	21070.00	12325.00					MINPT-O-EOU	
2985.79	291.35	2771.21		2674.43	15.32	OSF1.50	21840.00	12325.00					MinPt-CtCt	
2986.14	303.67	2763.35		2662.47	14.70	OSF1.50	22250.00	12325.00					MinPt-CtCt	
2986.25	306.01	2761.90		2660.24	14.58	OSF1.50	22332.02	12325.00					MinPis	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #72H
Surveys Off to 19073ft (Surcon
Corrected) (Def Survey)

549.87	32.81	548.59		517.07	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
549.87	32.81	548.59		517.07	N/A	MAS = 10.00 (m)	23.00	23.00			WRP	
547.24	32.81	541.22		514.44	115.37	MAS = 10.00 (m)	1060.00	1060.00			MINPT-O-EOU	
526.73	32.81	512.89		493.92	41.40	MAS = 10.00 (m)	2770.00	2770.00			MinPis	
527.15	32.81	512.33		494.34	38.46	MAS = 10.00 (m)	3000.00	3000.00			MINPT-O-EOU	
527.51	32.81	512.66		494.70	38.41	MAS = 10.00 (m)	3040.00	3040.00			MinPt-O-SF	
705.95	32.81	694.67		673.14	40.92	MAS = 10.00 (m)	5000.00	4987.92			MinPt-O-SF	
645.89	32.81	629.11		613.08	40.33	MAS = 10.00 (m)	6500.00	6487.90			MinPis	
646.00	32.81	628.98		613.19	40.33	MAS = 10.00 (m)	6560.00	6547.90			MINPT-O-EOU	
652.58	39.47	625.93		613.11	25.42	MAS = 10.00 (m)	8750.00	8737.90			MinPt-CtCt	
652.61	39.53	625.92		613.08	25.38	OSF1.50	8760.00	8747.90			MinPis	
657.29	40.32	630.06		616.96	25.05	OSF1.50	8900.00	8887.90			MinPt-O-SF	
3035.32	89.92	2975.04		2945.40	51.18	OSF1.50	15300.00	12325.00			MinPt-CtCt	
3036.73	93.67	2973.96		2943.06	49.13	OSF1.50	15460.00	12325.00			MINPT-O-EOU	
3038.73	96.08	2974.35		2942.65	47.92	OSF1.50	15560.00	12325.00			MinPt-O-ADP	
3052.94	134.93	2962.66		2918.01	34.18	OSF1.50	16850.00	12325.00			MinPt-CtCt	
3055.30	150.27	2954.80		2905.04	30.89	OSF1.50	17370.00	12325.00			MinPt-CtCt	
3055.40	160.59	2948.01		2894.81	28.71	OSF1.50	17720.00	12325.00			MinPt-CtCt	
3051.46	182.81	2929.26		2868.66	25.17	OSF1.50	18470.00	12325.00			MINPT-O-EOU	
3053.76	187.73	2928.29		2866.04	24.52	OSF1.50	18670.00	12325.00			MinPt-O-ADP	
3056.40	190.86	2928.84		2865.55	24.14	OSF1.50	18790.00	12325.00			MinPt-CtCt	
3054.13	228.83	2901.25		2825.30	20.10	OSF1.50	20010.00	12325.00			MinPt-CtCt	
3046.89	252.76	2878.05		2794.13	18.15	OSF1.50	20810.00	12325.00			MinPt-CtCt	
3053.37	289.94	2859.75		2763.43	15.85	OSF1.50	22050.00	12325.00			MinPt-CtCt	
3053.81	296.55	2855.78		2757.26	15.49	OSF1.50	22270.00	12325.00			MinPt-CtCt	
3053.98	298.22	2854.83		2755.75	15.41	OSF1.50	22332.02	12325.00			MinPis	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #44H
MWD Off-19884ft (Surcon
Corrected) (Def Survey)

1219.89	32.81	1218.60		1187.08	N/A	MAS = 10.00 (m)	0.00	0.00			MinPis	
1219.89	32.81	1218.58		1187.08	69739.28	MAS = 10.00 (m)	23.00	23.00			WRP	
1219.10	32.81	1214.59		1186.29	377.78	MAS = 10.00 (m)	770.00	770.00			MinPis	
1219.25	32.81	1213.72		1186.44	287.46	MAS = 10.00 (m)	1010.00	1010.00			MinPis	
1219.26	32.81	1213.56		1186.46	275.94	MAS = 10.00 (m)	1050.00	1050.00			MINPT-O-EOU	
1219.93	32.81	1213.36		1187.12	223.99	MAS = 10.00 (m)	1270.00	1270.00			MINPT-O-EOU	
1131.23	32.81	1116.86		1098.43	85.66	MAS = 10.00 (m)	3100.00	3099.98			MinPt-O-SF	
541.12	45.05	510.47		496.07	18.72	OSF1.50	9430.00	9417.90			MinPis	
541.17	45.12	510.48		496.06	18.69	OSF1.50	9440.00	9427.90			MinPt-O-ADP	

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor		
543.67	45.52	512.71	498.14	18.60	OSF1.50	9510.00	9497.90			MinPt-O-SF	
2423.34	46.45	2392.05	2376.89	79.91	OSF1.50	13550.00	12325.00			MinPt-CtCt	
2394.13	108.61	2321.40	2285.52	33.35	OSF1.50	17560.00	12325.00			MinPt-CtCt	
2369.13	158.38	2263.21	2210.75	22.57	OSF1.50	18680.00	12325.00			MinPt-CtCt	
2389.03	178.50	2249.71	2190.53	20.01	OSF1.50	18240.00	12325.00			MinPt-CtCt	
2368.48	187.35	2243.25	2181.13	19.05	OSF1.50	18540.00	12325.00			MinPt-CtCt	
2389.73	203.82	2233.52	2165.91	17.52	OSF1.50	19090.00	12325.00			MinPt-CtCt	
2361.33	239.25	2201.50	2122.08	14.86	OSF1.50	20280.00	12325.00			MinPt-CtCt	
2386.49	254.83	2196.27	2111.65	13.98	OSF1.50	20830.00	12325.00			MINPT-O-EOU	
2371.30	262.22	2196.15	2109.07	13.61	OSF1.50	21080.00	12325.00			MINPT-O-EOU	
2386.72	300.65	2185.95	2086.06	11.94	OSF1.50	2232.02	12325.00			MinPts	
Final Surveys - Cimarex Vaca Draw 20-17 Federal #73H Off- 19583ft (Surcon Corrected) (Def Survey)											
569.88	32.81	568.59	537.07	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
569.87	32.81	568.59	537.06	519009.59	MAS = 10.00 (m)	23.00	23.00			WRP	
569.60	32.81	567.29	536.79	525.30	MAS = 10.00 (m)	290.00	290.00			MinPts	
568.82	32.81	564.17	536.01	168.59	MAS = 10.00 (m)	800.00	800.00			MinPts	
568.99	32.81	563.98	536.18	152.78	MAS = 10.00 (m)	890.00	890.00			MINPT-O-EOU	
594.29	32.81	579.06	561.48	42.07	MAS = 10.00 (m)	3000.00	3000.00			MinPt-O-SF	
808.63	32.81	797.00	775.82	76.08	MAS = 10.00 (m)	5000.00	4987.92			MinPt-O-SF	
782.74	32.81	762.58	749.93	40.86	MAS = 10.00 (m)	7300.00	7287.90			MinPts	
783.56	32.81	762.30	750.75	38.67	MAS = 10.00 (m)	7560.00	7547.90			MINPT-O-EOU	
785.13	41.84	756.90	743.29	28.82	OSF1.50	9200.00	9187.90			MinPt-O-SF	
756.76	43.71	727.28	713.05	26.56	OSF1.50	9480.00	9467.90			MinPts	
756.81	43.78	727.29	713.04	26.52	OSF1.50	9490.00	9477.90			MinPt-O-ADP	
780.77	44.29	730.91	716.49	26.34	OSF1.50	9580.00	9567.90			MinPt-O-SF	
2582.94	108.14	2510.51	2474.80	36.15	OSF1.50	15670.00	12325.00			MinPt-CtCt	
2583.29	109.22	2510.13	2474.06	35.80	OSF1.50	15730.00	12325.00			MINPT-O-EOU	
2583.74	109.76	2510.23	2473.98	35.63	OSF1.50	15760.00	12325.00			MinPt-O-ADP	
2581.82	117.13	2503.40	2464.70	33.34	OSF1.50	15980.00	12325.00			MinPt-CtCt	
2573.65	149.15	2473.87	2424.49	26.05	OSF1.50	17070.00	12325.00			MinPt-CtCt	
2574.41	151.68	2472.95	2422.73	25.62	OSF1.50	17180.00	12325.00			MINPT-O-EOU	
2575.50	152.99	2473.16	2422.51	25.41	OSF1.50	17240.00	12325.00			MinPt-O-ADP	
2576.42	164.01	2466.74	2412.41	23.70	OSF1.50	17570.00	12325.00			MinPt-CtCt	
2563.98	186.98	2438.99	2377.00	20.67	OSF1.50	18340.00	12325.00			MinPt-CtCt	
2563.44	192.33	2434.88	2371.11	20.09	OSF1.50	18520.00	12325.00			MinPt-CtCt	
2563.99	194.25	2434.15	2369.74	19.90	OSF1.50	18610.00	12325.00			MINPT-O-EOU	
2564.48	194.84	2434.24	2369.63	19.84	OSF1.50	18640.00	12325.00			MinPt-O-ADP	
2562.61	232.08	2407.55	2330.53	16.63	OSF1.50	19850.00	12325.00			MinPt-CtCt	
2562.90	243.19	2400.43	2319.71	15.87	OSF1.50	20220.00	12325.00			MINPT-O-EOU	
2563.84	245.98	2399.52	2317.87	15.69	OSF1.50	20340.00	12325.00			MinPt-CtCt	
2563.92	254.02	2394.24	2309.90	15.20	OSF1.50	20580.00	12325.00			MinPt-CtCt	
2525.60	281.25	2337.76	2244.35	13.51	OSF1.50	21490.00	12325.00			MinPt-CtCt	
2526.20	283.52	2336.85	2242.68	13.41	OSF1.50	21590.00	12325.00			MINPT-O-EOU	
2526.86	284.31	2336.98	2242.56	13.37	OSF1.50	21630.00	12325.00			MinPt-O-ADP	
2547.62	294.58	2350.90	2253.04	13.01	OSF1.50	22040.00	12325.00			MINPT-O-EOU	
2548.11	295.11	2351.03	2253.00	12.99	OSF1.50	22050.00	12325.00			MinPt-O-ADP	
2567.42	301.18	2366.29	2266.23	12.83	OSF1.50	2232.02	12325.00			MinPt-O-SF	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #73H Off-
19583ft (Surcon Corrected)
(Def Survey)

Pass

Offset Trajectory		Separation		Allow	Sep.	Controlling	Reference Trajectory		Risk Level		Alert	Status
Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)	Fact.	Rule	MD (ft)	TVD (ft)	Alert	Minor	Major		
Final Surveys - Cimarex Vaca Draw 20-17 Federal #73H ST01 Off- 19719ft (Surcon Corrected) (Def Survey)												
569.88	32.81	568.59	537.07	N/A	MAS = 10.00 (m)	0.00	0.00				Surface	Pass
569.87	32.81	568.59	537.06	519009.59	MAS = 10.00 (m)	23.00	23.00				WRP	
569.60	32.81	567.23	536.79		MAS = 10.00 (m)	290.00	290.00				MinPts	
568.82	32.81	564.17	536.01	168.59	MAS = 10.00 (m)	800.00	800.00				MinPts	
568.99	32.81	563.98	536.18	152.78	MAS = 10.00 (m)	890.00	890.00				MINPT-O-EOU	
594.29	32.81	579.06	561.48	42.07	MAS = 10.00 (m)	3000.00	3000.00				MinPt-O-SF	
808.63	32.81	797.00	775.82	76.08	MAS = 10.00 (m)	5000.00	4987.92				MinPt-O-SF	
782.74	32.81	762.58	749.93	40.86	MAS = 10.00 (m)	7300.00	7287.90				MinPts	
783.56	32.81	762.30	750.75	38.67	MAS = 10.00 (m)	7560.00	7547.90				MINPT-O-EOU	
785.13	41.84	756.90	743.29	28.82	OSF1.50	9200.00	9187.90				MinPt-O-SF	
756.76	43.71	727.28	713.05	26.56	OSF1.50	9480.00	9467.90				MinPts	
756.81	43.78	727.29	713.04	26.52	OSF1.50	9490.00	9477.90				MinPt-O-ADP	
762.96	44.63	732.88	718.33	26.19	OSF1.50	9630.00	9617.90				MinPt-O-SF	
2455.24	35.61	2431.17	2419.63	106.32	OSF1.50	12300.00	12214.29				MinPt-O-SF	
2417.82	43.28	2388.63	2374.53	85.71	OSF1.50	13370.00	12325.00				MinPt-CtCt	
2418.70	46.10	2387.64	2372.61	80.39	OSF1.50	13510.00	12325.00				MINPT-O-EOU	
2415.95	53.64	2379.86	2362.31	68.79	OSF1.50	13790.00	12325.00				MinPt-CtCt	
2403.67	70.60	2356.27	2333.07	51.77	OSF1.50	14420.00	12325.00				MinPt-CtCt	
2403.93	71.46	2355.96	2332.47	51.15	OSF1.50	14470.00	12325.00				MINPT-O-EOU	
2404.36	71.97	2356.05	2332.39	50.78	OSF1.50	14500.00	12325.00				MinPt-O-ADP	
2384.95	95.92	2320.68	2289.03	37.67	OSF1.50	15320.00	12325.00				MinPt-CtCt	
2385.11	96.31	2320.58	2288.80	37.51	OSF1.50	15350.00	12325.00				MINPT-O-EOU	
2385.23	96.44	2320.61	2288.79	37.47	OSF1.50	15360.00	12325.00				MinPt-O-ADP	
2385.57	110.99	2311.24	2274.57	32.51	OSF1.50	15840.00	12325.00				MinPt-CtCt	
2385.81	111.66	2311.04	2274.15	32.32	OSF1.50	15880.00	12325.00				MINPT-O-EOU	
2386.08	111.99	2311.09	2274.09	32.23	OSF1.50	15900.00	12325.00				MinPt-O-ADP	
2383.97	126.61	2299.24	2257.36	28.45	OSF1.50	16370.00	12325.00				MinPt-CtCt	
2384.51	128.26	2298.68	2256.25	28.09	OSF1.50	16450.00	12325.00				MINPT-O-EOU	
2385.02	128.86	2298.78	2256.16	27.97	OSF1.50	16480.00	12325.00				MinPt-O-ADP	
2370.83	151.09	2269.78	2219.75	23.68	OSF1.50	17200.00	12325.00				MinPt-CtCt	
2368.66	160.08	2261.61	2208.58	22.32	OSF1.50	17500.00	12325.00				MinPt-CtCt	
2367.29	166.34	2256.06	2200.95	21.47	OSF1.50	17710.00	12325.00				MinPt-CtCt	
2370.14	188.15	2244.37	2181.99	18.99	OSF1.50	18440.00	12325.00				MinPt-CtCt	
2369.76	192.63	2241.02	2177.13	18.54	OSF1.50	18590.00	12325.00				MinPt-CtCt	
2370.31	194.92	2240.03	2175.39	18.33	OSF1.50	18690.00	12325.00				MINPT-O-EOU	
2370.79	195.51	2240.12	2175.28	18.27	OSF1.50	18720.00	12325.00				MinPt-O-ADP	
2370.05	207.27	2231.54	2162.78	17.23	OSF1.50	19080.00	12325.00				MinPt-CtCt	
2369.73	214.13	2226.65	2155.60	16.67	OSF1.50	19310.00	12325.00				MinPt-CtCt	
2367.58	229.35	2214.35	2138.23	15.54	OSF1.50	19820.00	12325.00				MinPt-CtCt	
2363.85	239.23	2204.04	2124.63	14.88	OSF1.50	20150.00	12325.00				MinPt-CtCt	
2363.50	248.82	2197.29	2114.68	14.30	OSF1.50	20470.00	12325.00				MinPt-CtCt	
2368.94	275.90	2184.68	2093.04	12.92	OSF1.50	21370.00	12325.00				MinPt-CtCt	
2370.01	292.08	2174.96	2077.93	12.21	OSF1.50	21910.00	12325.00				MinPt-CtCt	
2370.34	300.82	2169.46	2069.51	11.85	OSF1.50	22200.00	12325.00				MinPt-CtCt	
2370.53	304.71	2167.03	2065.71	11.70	OSF1.50	22332.02	12325.00				MinPts	

Final Surveys - Cimarex Vaca Draw 20-17 Federal #43H MWD 0ft-19167ft (Surcon Corrected) (Def Survey)												
1239.88	32.81	1238.59	1207.07	N/A		MAS = 10.00 (m)	0.00	0.00				Pass

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor		
1239.88	32.81	1238.58	1207.07	62174.22	MAS = 10.00 (m)	23.00	23.00			WRP	
1240.62	32.81	1236.54	1207.81	443.24	MAS = 10.00 (m)	670.00	670.00			MinPls	
1240.96	32.81	1235.27	1208.15	282.04	MAS = 10.00 (m)	1050.00	1050.00			MINPT-O-EOU	
1240.68	32.81	1234.21	1207.87	232.35	MAS = 10.00 (m)	1260.00	1260.00			MinPls	
1241.03	32.81	1233.87	1208.22	205.78	MAS = 10.00 (m)	1410.00	1410.00			MINPT-O-EOU	
1259.81	32.81	1245.39	1227.00	94.70	MAS = 10.00 (m)	3100.00	3099.98			MinPl-O-SF	
1131.56	32.81	1120.79	1098.75	118.63	MAS = 10.00 (m)	4640.00	4629.51			MinPl-O-SF	
1114.07	32.81	1103.08	1081.26	114.42	MAS = 10.00 (m)	4960.00	4947.95			MINPT-O-EOU	
1114.00	32.81	1103.07	1081.19	113.86	MAS = 10.00 (m)	4990.00	4977.92			MinPls	
1114.01	32.81	1103.07	1081.20	113.68	MAS = 10.00 (m)	5000.00	4987.92			MinPls	
1127.47	32.81	1114.24	1094.67	93.13	MAS = 10.00 (m)	5680.00	5667.90			MINPT-O-EOU	
1138.35	32.81	1119.15	1105.54	62.88	MAS = 10.00 (m)	7150.00	7137.90			MINPT-O-EOU	
1138.85	32.81	1119.14	1106.05	61.16	MAS = 10.00 (m)	7270.00	7257.90			MINPT-O-EOU	
1141.07	32.81	1119.58	1108.26	55.96	MAS = 10.00 (m)	7680.00	7667.90			MINPT-O-EOU	
1142.75	33.95	1119.75	1108.80	52.13	OSF1.50	8030.00	8017.90			MINPT-O-EOU	
1145.85	38.26	1119.98	1107.60	46.21	OSF1.50	8670.00	8657.90			MINPT-O-EOU	
1146.30	38.82	1120.06	1107.49	45.55	OSF1.50	8750.00	8737.90			MinPl-O-ADP	
1169.05	41.34	1141.15	1127.71	43.45	OSF1.50	9200.00	9187.90			MinPl-O-SF	
3237.84	36.84	3212.95	3201.01	135.55	OSF1.50	12830.00	12325.00			MinPl-O-ADP	
3239.45	47.47	3207.47	3191.98	104.49	OSF1.50	13450.00	12325.00			MinPl-CtCt	
3216.29	83.12	3160.55	3133.17	58.72	OSF1.50	14870.00	12325.00			MinPl-CtCt	
3194.53	126.32	3109.99	3068.22	38.22	OSF1.50	16390.00	12325.00			MinPl-CtCt	
3194.16	134.50	3104.17	3059.67	35.88	OSF1.50	16670.00	12325.00			MinPl-CtCt	
3193.61	146.76	3095.44	3046.85	32.85	OSF1.50	17090.00	12325.00			MinPl-CtCt	
3183.67	150.01	3083.33	3043.66	32.14	OSF1.50	17200.00	12325.00			MinPl-CtCt	
3196.26	164.38	3066.34	3031.88	29.33	OSF1.50	17690.00	12325.00			MinPl-CtCt	
3188.20	198.81	3055.34	2989.40	24.17	OSF1.50	18850.00	12325.00			MinPl-CtCt	
3178.08	241.35	3016.85	2936.73	19.83	OSF1.50	20280.00	12325.00			MinPl-CtCt	
3178.59	242.96	3016.29	2935.63	19.70	OSF1.50	20360.00	12325.00			MINPT-O-EOU	
3180.60	246.23	3016.12	2934.37	19.45	OSF1.50	20480.00	12325.00			MINPT-O-EOU	
3184.50	272.41	3002.56	2912.09	17.59	OSF1.50	21320.00	12325.00			MinPl-CtCt	
3188.53	286.39	2997.42	2902.28	16.75	OSF1.50	21820.00	12325.00			MINPT-O-EOU	
3189.53	296.64	2991.45	2892.89	16.18	OSF1.50	22130.00	12325.00			MinPl-CtCt	
3189.08	302.61	2967.01	2886.47	15.85	OSF1.50	22330.00	12325.00			MinPl-CtCt	
3189.08	302.63	2986.99	2886.44	15.85	OSF1.50	22332.02	12325.00			MinPls	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #4H ST01
MWD Off-22279ft (Surcon
Corrected) (Def Survey)

Pass

2438.66	32.81	2437.49	2405.86	N/A	MAS = 10.00 (m)	0.00	0.00			MinPls	
2438.69	32.81	2437.48	2405.88	67531.25	MAS = 10.00 (m)	23.00	23.00			WRP	
2438.75	32.81	2437.47	2405.94	22500.16	MAS = 10.00 (m)	50.00	50.00			MINPT-O-EOU	
2201.26	32.81	2185.84	2168.45	154.49	MAS = 10.00 (m)	3100.00	3099.98			MinPl-O-SF	
1380.04	47.11	1347.82	1332.93	46.26	OSF1.50	9180.00	9167.90			MinPl-CtCt	
1380.07	47.22	1347.77	1332.84	46.14	OSF1.50	9200.00	9187.90			MINPT-O-EOU	
1380.11	47.28	1347.77	1332.82	46.09	OSF1.50	9210.00	9197.90			MinPl-O-ADP	
1387.66	51.00	1352.85	1336.66	42.77	OSF1.50	9850.00	9837.90			MinPl-CtCt	
1387.84	51.58	1352.65	1336.26	42.27	OSF1.50	9950.00	9937.90			MINPT-O-EOU	
1388.37	52.49	1352.57	1335.88	41.52	OSF1.50	10100.00	10087.90			MINPT-O-EOU	
1388.47	52.61	1352.59	1335.86	41.43	OSF1.50	10120.00	10107.90			MinPl-O-ADP	
1390.33	54.14	1353.43	1336.19	40.25	OSF1.50	10370.00	10357.90			MINPT-O-EOU	
1390.60	54.45	1353.49	1336.14	40.01	OSF1.50	10420.00	10407.90			MinPl-O-ADP	

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor	Major	
	1391.63	57.02	1352.82	1334.62	38.16	OSF1.50	10840.00	10827.90		MinPt-CtCt	
	1391.70	57.19	1352.76	1334.50	38.04	OSF1.50	10870.00	10857.90		MINPT-O-EOU	
	1391.75	57.25	1352.78	1334.49	38.00	OSF1.50	10880.00	10867.90		MinPt-O-ADP	
	1436.46	63.04	1393.67	1373.41	35.39	OSF1.50	11860.00	11847.88		MinPt-O-SF	
	1344.75	72.42	1295.65	1272.32	28.78	OSF1.50	12990.00	12325.00		MinPt-CtCt	
	1345.55	74.03	1295.38	1271.52	28.15	OSF1.50	13110.00	12325.00		MINPT-O-EOU	
	1345.77	74.30	1295.41	1271.46	28.04	OSF1.50	13130.00	12325.00		MinPt-O-ADP	
	1355.20	78.66	1301.96	1276.54	26.62	OSF1.50	13410.00	12325.00		MinPt-O-ADP	
	1357.03	80.40	1302.61	1276.62	26.06	OSF1.50	13510.00	12325.00		MinPt-CtCt	
	1371.74	106.68	1299.82	1265.06	19.70	OSF1.50	14720.00	12325.00		MinPt-CtCt	
	1372.04	107.66	1299.47	1264.38	19.52	OSF1.50	14770.00	12325.00		MINPT-O-EOU	
	1372.36	108.04	1299.53	1264.31	19.45	OSF1.50	14790.00	12325.00		MinPt-O-ADP	
	1370.75	121.17	1289.17	1249.58	17.28	OSF1.50	15300.00	12325.00		MinPt-CtCt	
	1371.13	122.22	1288.85	1248.91	17.14	OSF1.50	15350.00	12325.00		MINPT-O-EOU	
	1371.66	122.84	1288.97	1248.82	17.05	OSF1.50	15380.00	12325.00		MinPt-O-ADP	
	1371.53	130.05	1284.03	1241.48	16.09	OSF1.50	15640.00	12325.00		MinPt-CtCt	
	1387.56	149.71	1286.95	1217.85	13.90	OSF1.50	16370.00	12325.00		MinPt-CtCt	
	1357.10	182.86	1234.38	1174.24	11.26	OSF1.50	17550.00	12325.00		MinPt-CtCt	
	1359.11	190.91	1231.03	1168.20	10.80	OSF1.50	17830.00	12325.00		MinPt-CtCt	
	1360.28	197.58	1227.75	1162.70	10.44	OSF1.50	18060.00	12325.00		MinPt-CtCt	
	1380.85	199.21	1227.24	1161.64	10.35	OSF1.50	18130.00	12325.00		MINPT-O-EOU	
	1367.66	208.14	1228.10	1159.52	9.95	OSF1.50	18440.00	12325.00		MINPT-O-EOU	
	1371.30	217.30	1225.63	1154.00	9.56	OSF1.50	18740.00	12325.00		MinPt-CtCt	
	1372.00	219.80	1224.67	1152.21	9.45	OSF1.50	18840.00	12325.00		MINPT-O-EOU	
	1372.60	220.49	1224.81	1152.11	9.42	OSF1.50	18870.00	12325.00		MinPt-O-ADP	
	1349.95	253.34	1180.24	1096.61	8.06	OSF1.50	19980.00	12325.00		MinPt-CtCt	
	1350.45	254.74	1179.80	1095.71	8.01	OSF1.50	20040.00	12325.00		MINPT-O-EOU	
	1351.74	256.24	1180.10	1095.50	7.97	OSF1.50	20100.00	12325.00		MinPt-O-ADP	
	1373.69	285.27	1182.71	1088.42	7.27	OSF1.50	21080.00	12325.00		MinPt-CtCt	
	1368.48	296.23	1170.19	1072.25	6.97	OSF1.50	21430.00	12325.00		MinPt-CtCt	
	1389.98	300.86	1168.60	1069.12	6.87	OSF1.50	21600.00	12325.00		MINPT-O-EOU	
	1371.26	302.41	1168.85	1068.85	6.84	OSF1.50	21660.00	12325.00		MinPt-O-ADP	
	1389.45	323.21	1153.17	1046.23	6.39	OSF1.50	22332.02	12325.00		MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #4H MWD
0ft-12228ft (Surcon Corrected)
(Def Survey)

Pass

2438.66	32.81	2436.68	2405.86	N/A	MAS = 10.00 (m)	0.00	0.00	MinPts
2438.69	32.81	2436.68	2405.88	67509.03	MAS = 10.00 (m)	23.00	23.00	WRP
2438.75	32.81	2436.68	2405.94	22492.75	MAS = 10.00 (m)	50.00	50.00	MINPT-O-EOU
2201.26	32.81	2184.94	2168.45	154.77	MAS = 10.00 (m)	3100.00	3099.98	MinPt-O-SF
2042.43	32.81	2028.18	2009.62	170.11	MAS = 10.00 (m)	3970.00	3964.51	MinPt-O-SF
1380.04	48.05	1346.88	1331.99	46.22	OSF1.50	9180.00	9167.90	MinPt-CtCt
1380.07	48.16	1346.83	1331.90	46.11	OSF1.50	9200.00	9187.90	MINPT-O-EOU
1380.11	48.22	1346.84	1331.89	46.05	OSF1.50	9210.00	9197.90	MinPt-O-ADP
1387.66	51.93	1351.92	1335.73	42.75	OSF1.50	9850.00	9837.90	MinPt-CtCt
1387.84	52.52	1351.71	1335.32	42.24	OSF1.50	9950.00	9937.90	MINPT-O-EOU
1388.33	53.35	1351.64	1334.97	41.55	OSF1.50	10090.00	10077.90	MINPT-O-EOU
1388.47	53.53	1351.66	1334.94	41.40	OSF1.50	10120.00	10107.90	MinPt-O-ADP
1390.29	54.99	1352.52	1335.30	40.29	OSF1.50	10360.00	10347.90	MINPT-O-EOU
1390.60	55.36	1352.58	1335.24	40.01	OSF1.50	10420.00	10407.90	MinPt-O-ADP
1391.63	57.93	1351.90	1333.71	38.15	OSF1.50	10840.00	10827.90	MinPt-CtCt
1391.70	58.11	1351.84	1333.59	38.03	OSF1.50	10870.00	10857.90	MINPT-O-EOU

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor	Major	
	1391.75	58.17	1351.86	37.99	OSF1.50	10880.00	10867.90				MinPt-O-ADP
	1451.26	63.64	1407.79	35.90	OSF1.50	11900.00	11887.62				MinPt-O-SF
	1502.50	65.15	1458.08	36.17	OSF1.50	12280.00	12190.98				MinPt-O-SF
	1512.25	65.87	1467.36	35.97	OSF1.50	12380.00	12252.36				MinPt-O-SF
	10191.77	76.95	10139.81	203.87	OSF1.50	22332.02	12325.00				TD
Final Surveys - Cimarex Vaca											
Draw 20-17 Federal #3H MWD											
0ft-22454' (Surcon Corrected)											
(Def Survey)											
	2458.61	32.81	2457.47	882583.49	MAS = 10.00 (m)	0.00	0.00				Surface
	2458.56	32.81	2457.37	39250.88	MAS = 10.00 (m)	23.00	23.00				WRP
	2456.11	32.81	2453.79	1880.39	MAS = 10.00 (m)	310.00	310.00				MinPts
	2456.15	32.81	2453.74	1768.43	MAS = 10.00 (m)	330.00	330.00				MINPT-O-EOU
	2455.33	32.81	2447.64	379.51	MAS = 10.00 (m)	1490.00	1490.00				MinPts
	2349.83	32.81	2335.44	2317.02	MAS = 10.00 (m)	3100.00	3099.98				MinPt-O-SF
	2086.70	32.81	2074.96	2053.90	MAS = 10.00 (m)	5000.00	4987.92				MinPt-O-SF
	1794.37	44.38	1764.14	1749.99	OSF1.50	9220.00	9207.90				MinPt-CtCt
	1794.55	44.97	1763.93	1749.58	OSF1.50	9310.00	9297.90				MINPT-O-EOU
	1795.42	45.97	1764.14	1749.45	OSF1.50	9450.00	9447.90				MinPt-O-ADP
	1801.45	58.21	1762.00	1743.23	OSF1.50	11350.00	11337.90				MinPt-CtCt
	1801.87	59.28	1761.71	1742.58	OSF1.50	11500.00	11487.90				MINPT-O-EOU
	1802.31	59.83	1761.79	1742.46	OSF1.50	11580.00	11567.90				MinPt-O-ADP
	1804.45	62.79	1761.96	1741.66	OSF1.50	12070.00	12047.56				MinPt-CtCt
	1804.49	62.89	1761.93	1741.60	OSF1.50	12090.00	12064.82				MINPT-O-EOU
	1804.53	62.94	1761.94	1741.59	OSF1.50	12100.00	12073.28				MinPt-O-ADP
	1804.67	63.45	1761.74	1741.22	OSF1.50	12210.00	12158.16				MinPt-CtCt
	1804.69	63.50	1761.73	1741.19	OSF1.50	12220.00	12165.04				MINPT-O-EOU
	1804.74	63.55	1761.74	1741.19	OSF1.50	12230.00	12171.76				MinPt-O-ADP
	1806.14	64.03	1762.83	1742.12	OSF1.50	12330.00	12229.94				MINPT-O-EOU
	1806.19	64.08	1762.64	1742.11	OSF1.50	12340.00	12234.79				MinPt-O-ADP
	1794.37	70.30	1746.90	1724.07	OSF1.50	13010.00	12325.00				MinPt-CtCt
	1794.49	70.65	1746.79	1723.84	OSF1.50	13040.00	12325.00				MINPT-O-EOU
	1794.60	70.77	1746.82	1723.83	OSF1.50	13050.00	12325.00				MinPt-O-ADP
	1796.40	73.07	1747.08	1723.33	OSF1.50	13210.00	12325.00				MINPT-O-EOU
	1796.97	74.88	1746.45	1722.09	OSF1.50	13320.00	12325.00				MinPt-CtCt
	1798.87	79.34	1745.38	1719.53	OSF1.50	13580.00	12325.00				MINPT-O-EOU
	1795.05	88.44	1735.49	1706.61	OSF1.50	14030.00	12325.00				MinPt-CtCt
	1795.32	89.34	1735.16	1705.98	OSF1.50	14080.00	12325.00				MINPT-O-EOU
	1795.94	90.10	1735.28	1705.84	OSF1.50	14120.00	12325.00				MinPt-O-ADP
	1799.40	97.58	1733.75	1701.82	OSF1.50	14440.00	12325.00				MinPt-CtCt
	1800.10	99.70	1733.03	1700.39	OSF1.50	14540.00	12325.00				MINPT-O-EOU
	1800.79	100.55	1733.16	1700.23	OSF1.50	14580.00	12325.00				MinPt-O-ADP
	1804.85	107.24	1732.76	1697.61	OSF1.50	14840.00	12325.00				MinPt-CtCt
	1804.72	121.66	1723.03	1683.07	OSF1.50	15410.00	12325.00				MINPT-O-EOU
	1807.36	128.20	1721.31	1679.16	OSF1.50	15670.00	12325.00				MinPt-CtCt
	1808.30	132.54	1719.35	1675.76	OSF1.50	15820.00	12325.00				MinPt-CtCt
	1807.75	145.80	1709.96	1661.95	OSF1.50	16310.00	12325.00				MinPt-CtCt
	1804.18	156.59	1699.20	1647.59	OSF1.50	16700.00	12325.00				MinPt-CtCt
	1804.94	164.48	1694.69	1640.45	OSF1.50	16980.00	12325.00				MinPt-CtCt
	1803.46	169.85	1689.63	1633.61	OSF1.50	17170.00	12325.00				MinPt-CtCt
	1803.85	177.83	1684.71	1626.02	OSF1.50	17450.00	12325.00				MinPt-CtCt
	1802.93	186.49	1678.01	1616.43	OSF1.50	17750.00	12325.00				MinPt-CtCt
	1802.88	189.90	1675.69	1612.98	OSF1.50	17870.00	12325.00				MinPt-CtCt

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Minor	Major		
	1803.49	191.84	1675.01	14.22	OSF1.50	17950.00	12325.00			MINPT-O-EOU	
	1800.48	203.27	1664.37	13.39	OSF1.50	18330.00	12325.00			MinPt-CtCt	
	1800.72	211.13	1659.37	12.89	OSF1.50	18600.00	12325.00			MinPt-CtCt	
	1799.04	230.12	1645.03	11.81	OSF1.50	19250.00	12325.00			MinPt-CtCt	
	1799.16	233.96	1642.59	11.61	OSF1.50	19380.00	12325.00			MinPt-CtCt	
	1798.14	256.51	1626.54	10.58	OSF1.50	20140.00	12325.00			MinPt-CtCt	
	1799.01	259.34	1625.52	10.47	OSF1.50	20250.00	12325.00			MINPT-O-EOU	
	1800.27	260.85	1625.77	10.41	OSF1.50	20310.00	12325.00			MinPt-O-ADP	
	1801.40	288.15	1608.71	9.43	OSF1.50	21210.00	12325.00			MinPt-CtCt	
	1797.02	306.25	1592.26	8.84	OSF1.50	21820.00	12325.00			MinPt-CtCt	
	1797.74	308.50	1591.47	8.78	OSF1.50	21910.00	12325.00			MINPT-O-EOU	
	1798.33	309.22	1591.58	8.77	OSF1.50	21940.00	12325.00			MinPt-O-ADP	
	1802.02	313.54	1592.40	8.66	OSF1.50	22080.00	12325.00			MINPT-O-EOU	
	1803.82	315.68	1592.77	8.61	OSF1.50	22160.00	12325.00			MinPt-O-ADP	
	1809.28	320.52	1595.01	8.51	OSF1.50	22332.02	12325.00			MinPt-O-SF	
Final Surveys - Cimarex Vaca											
Draw 20-17 Federal #2H MWD											
0ft-22179ft (Surcon Corrected)											
(Def Survey)											
	2478.64	32.81	2477.62	2445.83	N/A	MAS = 10.00 (m)	0.00	0.00		Surface	
	2478.63	32.81	2477.56	2445.82	52956.79	MAS = 10.00 (m)	23.00	23.00		WRP	
	2477.59	32.81	2473.35	2444.78	770.34	MAS = 10.00 (m)	770.00	770.00		MinPls	
	2478.13	32.81	2471.95	2445.32	480.36	MAS = 10.00 (m)	1220.00	1220.00		MinPls	
	2460.01	32.81	2444.80	2427.20	173.41	MAS = 10.00 (m)	3000.00	3000.00		MinPt-O-SF	
	2456.18	32.81	2440.98	2423.37	173.32	MAS = 10.00 (m)	3100.00	3099.98		MinPt-O-SF	
	2402.82	32.81	2388.89	2370.02	186.85	MAS = 10.00 (m)	3710.00	3706.45		MinPt-O-SF	
	2328.69	32.81	2316.17	2295.89	204.87	MAS = 10.00 (m)	4450.00	4440.93		MinPt-O-SF	
	2283.84	32.81	2271.40	2251.03	203.35	MAS = 10.00 (m)	5000.00	4987.92		MinPt-O-SF	
	2208.20	47.50	2176.08	2160.70	71.76		9980.00	9967.90		MinPt-CtCt	
	2208.45	48.09	2175.94	2160.37	70.87	OSF1.50	10060.00	10047.90		MINPT-O-EOU	
	2210.49	50.74	2176.21	2159.76	67.11	OSF1.50	10450.00	10437.90		MINPT-O-EOU	
	2211.42	51.81	2176.42	2159.61	65.71	OSF1.50	10600.00	10587.90		MinPt-O-ADP	
	2213.37	53.96	2176.94	2159.41	63.08	OSF1.50	10910.00	10897.90		MinPt-O-ADP	
	2194.35	82.32	2139.03	2112.03	40.62	OSF1.50	13730.00	12325.00		MinPt-CtCt	
	2194.80	83.53	2138.67	2111.27	40.03	OSF1.50	13800.00	12325.00		MINPT-O-EOU	
	2196.07	85.76	2138.45	2110.31	38.99	OSF1.50	13910.00	12325.00		MINPT-O-EOU	
	2196.53	86.29	2138.56	2110.24	38.75	OSF1.50	13940.00	12325.00		MinPt-O-ADP	
	2202.20	95.14	2138.34	2107.07	35.19	OSF1.50	14330.00	12325.00		MinPt-CtCt	
	2202.02	98.39	2135.99	2103.63	34.01	OSF1.50	14470.00	12325.00		MinPt-CtCt	
	2202.76	100.48	2135.35	2102.30	33.30	OSF1.50	14570.00	12325.00		MINPT-O-EOU	
	2203.65	101.53	2135.52	2102.12	32.96	OSF1.50	14620.00	12325.00		MinPt-O-ADP	
	2195.72	123.40	2113.01	2072.32	26.96	OSF1.50	15470.00	12325.00		MinPt-CtCt	
	2195.18	126.83	2110.19	2068.35	26.22	OSF1.50	15600.00	12325.00		MinPt-CtCt	
	2195.72	128.36	2109.71	2067.37	25.91	OSF1.50	15670.00	12325.00		MINPT-O-EOU	
	2196.27	129.00	2109.83	2067.27	25.79	OSF1.50	15700.00	12325.00		MinPt-O-ADP	
	2203.08	135.05	2112.61	2068.03	24.70	OSF1.50	15930.00	12325.00		MinPt-O-ADP	
	2206.85	147.62	2108.00	2059.23	22.61	OSF1.50	16370.00	12325.00		MinPt-CtCt	
	2197.74	167.98	2085.32	2029.77	19.77	OSF1.50	17100.00	12325.00		MinPt-CtCt	
	2198.20	169.34	2084.86	2028.85	19.61	OSF1.50	17160.00	12325.00		MINPT-O-EOU	
	2198.95	170.24	2085.01	2028.71	19.52	OSF1.50	17200.00	12325.00		MinPt-O-ADP	
	2198.19	189.92	2071.13	2008.27	17.47	OSF1.50	17870.00	12325.00		MinPt-CtCt	
	2198.69	191.52	2070.57	2007.18	17.33	OSF1.50	17940.00	12325.00		MINPT-O-EOU	
	2199.26	192.19	2070.70	2007.08	17.27	OSF1.50	17970.00	12325.00		MinPt-O-ADP	

Offset Trajectory		Separation		Allow	Sep.	Controlling	Reference Trajectory		Alert	Risk Level		Alert	Status
Ct-Ct (ft)	MAS (ft)	EOU (ft)	Dev. (ft)		Fact.	Rule	MD (ft)	TVD (ft)		Minor	Major		
2213.10	201.33	2078.45	2011.77	16.59		OSF1.50	18290.00	12325.00	MINPT-O-EOU				MINPT-O-EOU
2213.37	201.60	2078.54	2011.77	16.57		OSF1.50	18300.00	12325.00	MinPt-O-ADP				MinPt-O-ADP
2204.91	216.76	2059.96	1988.15	15.34		OSF1.50	18800.00	12325.00	MinPt-CtCt				MinPt-CtCt
2205.81	219.27	2059.19	1986.53	15.17		OSF1.50	18900.00	12325.00	MINPT-O-EOU				MINPT-O-EOU
2208.31	222.17	2059.76	1986.14	14.99		OSF1.50	19010.00	12325.00	MinPt-O-ADP				MinPt-O-ADP
2206.30	235.73	2048.70	1970.56	14.11		OSF1.50	19450.00	12325.00	MinPt-CtCt				MinPt-CtCt
2208.18	240.59	2047.35	1967.58	13.83		OSF1.50	19630.00	12325.00	MINPT-O-EOU				MINPT-O-EOU
2209.45	242.13	2047.59	1967.32	13.75		OSF1.50	19690.00	12325.00	MinPt-CtCt				MinPt-CtCt
2216.59	253.07	2047.44	1963.52	13.20		OSF1.50	20040.00	12325.00	MINPT-O-ADP				MINPT-O-ADP
2217.33	255.28	2046.71	1962.05	13.09		OSF1.50	20130.00	12325.00	MINPT-O-EOU				MINPT-O-EOU
2218.14	256.24	2046.88	1961.90	13.04		OSF1.50	20170.00	12325.00	MinPt-O-ADP				MinPt-O-ADP
2205.79	271.68	2024.23	1934.10	12.23		OSF1.50	20670.00	12325.00	MinPt-CtCt				MinPt-CtCt
2205.52	276.41	2020.81	1929.11	12.02		OSF1.50	20830.00	12325.00	MINPT-O-EOU				MINPT-O-EOU
2206.20	278.34	2020.20	1927.86	11.94		OSF1.50	20910.00	12325.00	MinPt-CtCt				MinPt-CtCt
2204.88	284.15	2015.01	1920.73	11.89		OSF1.50	21090.00	12325.00	MINPT-O-EOU				MINPT-O-EOU
2205.25	285.27	2014.63	1919.98	11.64		OSF1.50	21140.00	12325.00	MinPt-O-ADP				MinPt-O-ADP
2205.78	285.93	2014.73	1919.86	11.62		OSF1.50	21170.00	12325.00	MinPt-CtCt				MinPt-CtCt
2198.32	307.44	1992.91	1890.87	10.77		OSF1.50	21870.00	12325.00	MINPT-O-EOU				MINPT-O-EOU
2198.62	308.55	1992.48	1890.08	10.73		OSF1.50	21920.00	12325.00	MinPt-O-ADP				MinPt-O-ADP
2199.14	309.18	1992.58	1889.96	10.71		OSF1.50	21950.00	12325.00	MINPT-O-EOU				MINPT-O-EOU
2192.96	321.65	1978.08	1871.31	10.28		OSF1.50	22332.02	12325.00	MinPts				MinPts

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #6H MWD
0ft-22328ft (Surcon Corrected)
(Def Survey)

Pass											
3678.89	32.81	3677.75	3646.06	N/A		MAS = 10.00 (m)	0.00	0.00	MinPts		
3678.90	32.81	3677.72	3646.09	77171.42		MAS = 10.00 (m)	23.00	23.00	WRP		
3679.20	32.81	3677.20	3646.62	3355.90		MAS = 10.00 (m)	290.00	290.00	MinPts		
3680.32	32.81	3676.66	3647.52	1452.29		MAS = 10.00 (m)	590.00	590.00	MINPT-O-EOU		
3675.07	32.81	3667.18	3642.26	544.04		MAS = 10.00 (m)	1540.00	1540.00	MinPts		
3675.21	32.81	3667.03	3642.41	521.08		MAS = 10.00 (m)	1600.00	1600.00	MINPT-O-EOU		
3678.24	32.81	3668.96	3645.43	451.01		MAS = 10.00 (m)	1820.00	1820.00	MinPt-O-SF		
3571.67	32.81	3557.02	3538.86	265.47		MAS = 10.00 (m)	3100.00	3099.98	MinPt-O-SF		
3306.60	32.81	3294.21	3273.79	303.09		MAS = 10.00 (m)	5000.00	4987.92	MinPt-CtCt		
3038.68	42.97	3009.37	2995.72	111.18		OSF1.50	9060.00	9047.90	MINPT-O-EOU		
3038.93	43.81	3009.05	2995.11	108.94		OSF1.50	9190.00	9177.90	MinPt-O-ADP		
3040.53	45.72	3009.39	2994.81	104.24		OSF1.50	9480.00	9467.90	MinPt-CtCt		
3037.06	55.25	2999.56	2981.81	85.50		OSF1.50	10990.00	10977.90	MINPT-O-EOU		
3037.22	55.64	2999.45	2981.57	84.88		OSF1.50	11050.00	11037.90	MinPt-O-ADP		
3037.39	55.84	2999.49	2981.54	84.57		OSF1.50	11080.00	11067.90	MINPT-O-EOU		
3055.88	60.44	3014.97	2995.44	78.18		OSF1.50	11800.00	11787.90	MINPT-O-EOU		
3055.92	60.50	3014.98	2995.43	78.10		OSF1.50	11810.00	11797.90	MinPt-O-ADP		
3004.36	70.43	2956.77	2933.94	65.73		OSF1.50	12980.00	12325.00	MinPt-CtCt		
3004.50	70.74	2956.70	2933.76	65.44		OSF1.50	13010.00	12325.00	MINPT-O-EOU		
3004.60	70.85	2956.73	2933.75	65.33		OSF1.50	13020.00	12325.00	MinPt-O-ADP		
3039.98	78.71	2986.88	2961.26	59.29		OSF1.50	13530.00	12325.00	MinPts		
3049.34	84.89	2992.13	2964.45	55.04		OSF1.50	13820.00	12325.00	MinPt-CtCt		
3036.15	97.25	2970.69	2938.90	47.71		OSF1.50	14380.00	12325.00	MinPt-CtCt		
3036.86	107.58	2964.52	2929.28	43.06		OSF1.50	14810.00	12325.00	MinPt-CtCt		
3036.97	113.82	2960.47	2923.15	40.86		OSF1.50	15060.00	12325.00	MinPt-CtCt		
3038.00	121.53	2956.36	2916.46	38.05		OSF1.50	15360.00	12325.00	MinPt-CtCt		
3038.24	129.47	2951.31	2908.77	35.69		OSF1.50	15660.00	12325.00	MinPt-CtCt		
3038.99	131.89	2950.44	2907.09	35.03		OSF1.50	15770.00	12325.00	MINPT-O-EOU		

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor	Major	
3039.71	132.75	2950.59	2906.95	34.81	OSF1.50	15810.00	12325.00				MinPt-O-ADP
3039.53	136.97	2947.60	2902.56	33.72	OSF1.50	15940.00	12325.00				MinPt-CtCt
3035.91	149.87	2935.37	2886.03	30.75	OSF1.50	16410.00	12325.00				MinPt-CtCt
3030.49	162.67	2921.41	2867.81	28.25	OSF1.50	16870.00	12325.00				MinPt-CtCt
3029.20	167.21	2917.11	2862.00	27.47	OSF1.50	17030.00	12325.00				MinPt-CtCt
3029.57	168.38	2916.68	2861.19	27.28	OSF1.50	17090.00	12325.00				MINPT-O-EOU
3030.07	168.95	2916.81	2861.12	27.19	OSF1.50	17120.00	12325.00				MinPt-O-ADP
3034.89	172.58	2919.22	2862.31	26.65	OSF1.50	17260.00	12325.00				MINPT-O-EOU
3035.15	172.95	2919.23	2862.20	26.59	OSF1.50	17270.00	12325.00				MinPt-O-ADP
3040.68	181.08	2919.34	2859.60	25.43	OSF1.50	17540.00	12325.00				MINPT-O-EOU
3041.63	182.23	2919.53	2859.40	25.28	OSF1.50	17590.00	12325.00				MinPt-O-ADP
3039.70	210.15	2898.98	2829.54	21.88	OSF1.50	18530.00	12325.00				MinPt-CtCt
3040.18	211.61	2888.49	2828.57	21.73	OSF1.50	18600.00	12325.00				MINPT-O-EOU
3040.70	212.23	2898.60	2828.48	21.67	OSF1.50	18630.00	12325.00				MinPt-O-ADP
3027.67	231.47	2872.73	2796.20	19.77	OSF1.50	19280.00	12325.00				MinPt-CtCt
3028.23	233.24	2872.11	2794.99	19.62	OSF1.50	19340.00	12325.00				MINPT-O-EOU
3028.95	234.11	2872.25	2794.84	19.55	OSF1.50	19380.00	12325.00				MinPt-O-ADP
3031.10	238.51	2871.47	2792.59	19.20	OSF1.50	19520.00	12325.00				MINPT-O-EOU
3031.63	239.15	2871.57	2792.48	19.15	OSF1.50	19550.00	12325.00				MinPt-O-ADP
3062.59	260.57	2888.27	2802.02	17.74	OSF1.50	20250.00	12325.00				MinPt-CtCt
3063.12	262.07	2887.80	2801.05	17.64	OSF1.50	20320.00	12325.00				MINPT-O-EOU
3028.60	306.28	2823.78	2722.31	14.91	OSF1.50	21790.00	12325.00				MinPt-CtCt
3029.11	308.07	2823.11	2721.04	14.83	OSF1.50	21870.00	12325.00				MINPT-O-EOU
3029.80	308.94	2823.22	2720.86	14.79	OSF1.50	21910.00	12325.00				MinPt-O-ADP
3040.67	321.89	2825.48	2718.78	14.24	OSF1.50	22332.02	12325.00				MinPts

Cimarex Vaca Draw 20-17
Federal #31H Rev1 RM
20Feb20 (Def Plan)

											Pass
3098.37	32.81	3097.08	3065.56	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
3098.37	32.81	3097.03	3065.56	63649.89	MAS = 10.00 (m)	23.00	23.00				WRP
3098.37	32.81	3081.87	3065.56	203.63	MAS = 10.00 (m)	2470.00	2470.00				MinPts
3098.40	32.81	3081.80	3065.60	202.13	MAS = 10.00 (m)	2500.00	2500.00				MINPT-O-EOU
3113.46	32.81	3095.82	3080.65	190.31	MAS = 10.00 (m)	3000.00	3000.00				MinPt-O-SF
3075.56	67.49	3030.12	3008.07	69.69	OSF1.50	10560.00	10547.90				MinPt-CtCt
3075.62	67.71	3030.04	3007.91	69.46	OSF1.50	10590.00	10577.90				MINPT-O-EOU
3075.68	67.78	3030.05	3007.90	69.39	OSF1.50	10600.00	10587.90				MinPt-O-ADP
3113.28	70.50	3065.85	3042.78	67.44	OSF1.50	11130.00	11117.90				MinPt-O-SF
3479.30	346.90	3247.61	3132.40	15.09	OSF1.50	22332.02	12325.00				MinPts

Cimarex Vaca Draw 20-17
Federal #30H Rev1 RM
20Feb20 (Def Plan)

											Pass
3118.35	32.81	3117.06	3085.54	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
3118.35	32.81	3117.01	3085.54	62911.46	MAS = 10.00 (m)	23.00	23.00				WRP
3118.35	32.81	3105.00	3085.54	258.28	MAS = 10.00 (m)	1970.00	1970.00				MinPts
3118.40	32.81	3104.93	3085.59	255.69	MAS = 10.00 (m)	2000.00	2000.00				MINPT-O-EOU
3203.97	32.81	3187.30	3171.16	208.20	MAS = 10.00 (m)	3000.00	3000.00				MinPt-O-SF
3685.91	40.39	3658.56	3645.52	141.35	OSF1.50	6740.00	6727.90				MinPt-O-SF
3686.72	60.69	3645.83	3626.03	93.05	OSF1.50	9900.00	9887.90				MINPT-O-EOU
3686.76	60.76	3645.83	3626.01	92.96	OSF1.50	9910.00	9897.90				MinPt-O-ADP
3794.00	65.64	3749.82	3728.37	88.41	OSF1.50	10890.00	10877.90				MinPt-O-SF
3988.56	68.11	3942.73	3920.46	89.51	OSF1.50	11580.00	11567.90				MinPt-O-SF
4279.67	350.45	4045.61	3929.22	18.38	OSF1.50	22332.02	12325.00				MinPts

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)		

Cimarex Vaca Draw 20-17
Federal #29H Rev1 RM
20Feb20 (Def Plan)

3138.37	32.81	3137.08	3105.56	N/A	MAS = 10.00 (m)	0.00	0.00	Surface	Pass
3138.37	32.81	3137.03	3105.56	64471.91	MAS = 10.00 (m)	23.00	23.00	WRP	
3138.37	32.81	3128.16	3105.56	351.48	MAS = 10.00 (m)	1470.00	1470.00	MinPts	
3138.42	32.81	3128.08	3105.61	346.66	MAS = 10.00 (m)	1500.00	1500.00	MINPT-O-EOU	
3319.51	32.81	3303.35	3286.71	223.11	MAS = 10.00 (m)	3100.00	3099.98	MinPt-O-SF	
3809.80	45.86	3778.80	3763.94	128.15	OSF1.50	7030.00	7017.90	MinPt-O-SF	
3808.45	68.62	3762.27	3739.83	84.81	OSF1.50	10860.00	10847.90	MinPt-CtCt	
3808.52	68.90	3762.16	3739.62	84.46	OSF1.50	10900.00	10887.90	MINPT-O-EOU	
3808.63	69.04	3762.18	3739.59	84.29	OSF1.50	10920.00	10907.90	MinPt-O-ADP	
3890.92	73.70	3841.35	3817.22	80.57	OSF1.50	11780.00	11767.90	MinPt-O-SF	
4025.13	352.25	3789.87	3672.88	17.20	OSF1.50	22332.02	12325.00	MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #7H MWD
0ft-2254ft (Surcon Corrected)
(Def Survey)

3698.90	32.81	3697.72	3666.09	N/A	MAS = 10.00 (m)	0.00	0.00	MinPts	Pass
3698.94	32.81	3697.73	3666.13	95151.85	MAS = 10.00 (m)	23.00	23.00	WRP	
3679.56	32.81	3665.04	3646.75	273.42	MAS = 10.00 (m)	3100.00	3099.98	MinPt-O-SF	
3623.16	32.81	3610.38	3590.35	310.77	MAS = 10.00 (m)	3720.00	3716.37	MinPt-O-SF	
3560.64	32.81	3549.25	3527.83	348.53	MAS = 10.00 (m)	4450.00	4440.93	MinPt-O-SF	
3526.43	32.81	3515.11	3493.63	348.96	MAS = 10.00 (m)	4920.00	4908.00	MinPts	
3527.31	32.81	3515.82	3494.50	343.68	MAS = 10.00 (m)	5010.00	4997.91	MinPt-O-SF	
3456.97	32.81	3434.84	3424.16	166.24	MAS = 10.00 (m)	7730.00	7717.90	MinPts	
3457.11	32.90	3434.73	3424.21	164.28	OSF1.50	7790.00	7777.90	MINPT-O-EOU	
3457.27	33.08	3434.76	3424.18	163.32	OSF1.50	7820.00	7807.90	MinPt-O-ADP	
3457.98	33.98	3434.88	3424.00	158.87	OSF1.50	7960.00	7947.90	MINPT-O-EOU	
3458.67	35.07	3434.84	3423.60	153.75	OSF1.50	8130.00	8117.90	MINPT-O-EOU	
3458.78	35.20	3434.86	3423.58	153.17	OSF1.50	8150.00	8137.90	MinPt-O-ADP	
3483.55	46.18	3452.34	3437.37	116.33	OSF1.50	9840.00	9827.90	MinPt-CtCt	
3483.71	46.81	3452.08	3436.91	114.74	OSF1.50	9940.00	9927.90	MINPT-O-EOU	
3483.92	47.05	3452.12	3436.87	114.14	OSF1.50	9980.00	9967.90	MinPt-O-ADP	
3489.95	57.40	3431.24	3412.55	92.78	OSF1.50	11490.00	11477.90	MinPt-CtCt	
3470.63	59.54	3430.49	3411.09	89.38	OSF1.50	11800.00	11787.90	MINPT-O-EOU	
3470.78	59.73	3430.52	3411.05	89.10	OSF1.50	11830.00	11817.90	MinPt-O-ADP	
3484.60	63.88	3441.61	3420.71	83.33	OSF1.50	12510.00	12290.05	MinPt-CtCt	
3484.63	64.03	3441.55	3420.60	83.14	OSF1.50	12530.00	12294.30	MINPT-O-EOU	
3458.58	71.25	3410.66	3387.32	74.06	OSF1.50	13120.00	12325.00	MinPt-CtCt	
3458.81	71.89	3410.48	3386.92	73.40	OSF1.50	13170.00	13170.00	MinPt-O-ADP	
3459.02	72.14	3410.52	3386.88	73.14	OSF1.50	13180.00	13250.00	MinPt-CtCt	
3441.26	91.74	3379.69	3349.52	57.02	OSF1.50	14180.00	14180.00	MINPT-O-EOU	
3441.85	93.42	3379.15	3348.43	55.99	OSF1.50	14270.00	14270.00	MINPT-O-EOU	
3444.88	96.11	3379.39	3347.77	54.44	OSF1.50	14390.00	14390.00	MINPT-O-EOU	
3444.93	97.35	3379.61	3347.99	53.75	OSF1.50	14450.00	14450.00	MinPt-O-ADP	
3449.02	101.03	3381.26	3347.99	51.83	OSF1.50	14610.00	14610.00	MinPt-O-ADP	
3470.69	113.85	3394.39	3356.84	46.20	OSF1.50	15140.00	15140.00	MinPts	
3443.40	141.40	3348.72	3302.00	36.84	OSF1.50	16130.00	16130.00	MinPt-CtCt	
3442.91	147.25	3344.34	3295.67	35.36	OSF1.50	16340.00	16340.00	MinPt-CtCt	
3443.41	148.69	3343.87	3294.72	35.02	OSF1.50	16410.00	16410.00	MINPT-O-EOU	
3443.91	149.30	3343.96	3294.61	34.88	OSF1.50	16440.00	16440.00	MinPt-O-ADP	

Offset Trajectory	Separation		Allow	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor		
	3446.30	153.16	3343.78	3293.14	34.02	OSF1.50	16570.00	12325.00		MINPT-O-EOU	
	3446.62	153.54	3343.85	3293.08	33.93	OSF1.50	16590.00	12325.00		MinPt-O-ADP	
	3451.08	213.90	3308.07	3237.18	24.33	OSF1.50	18680.00	12325.00		MinPt-CtCt	
	3452.62	217.85	3306.98	3234.77	23.90	OSF1.50	18840.00	12325.00		MINPT-O-EOU	
	3457.76	225.55	3306.98	3232.20	23.11	OSF1.50	19100.00	12325.00		MINPT-O-EOU	
	3459.17	227.25	3307.26	3231.91	22.95	OSF1.50	19170.00	12325.00		MinPt-O-ADP	
	3454.79	250.85	3287.15	3203.94	20.75	OSF1.50	19940.00	12325.00		MinPt-CtCt	
	3461.39	270.25	3280.82	3191.14	19.29	OSF1.50	20620.00	12325.00		MINPT-O-EOU	
	3462.38	271.42	3281.03	3190.96	19.21	OSF1.50	20670.00	12325.00		MinPt-O-ADP	
	3464.29	286.93	3272.60	3177.36	18.18	OSF1.50	21160.00	12325.00		MinPt-CtCt	
	3466.82	303.61	3254.01	3153.21	17.14	OSF1.50	21720.00	12325.00		MinPt-CtCt	
	3457.67	306.54	3252.91	3151.14	16.98	OSF1.50	21840.00	12325.00		MINPT-O-EOU	
	3458.42	307.44	3253.05	3150.98	16.93	OSF1.50	21880.00	12325.00		MinPt-O-ADP	
	3465.13	322.39	3249.80	3142.74	16.18	OSF1.50	22332.02	12325.00		MinPts	

Cimarex Vaca Draw 20-17
Federal #6H MWD
Final(Surcon Corrected) (Def
Survey)

Pass

3758.44	32.81	3756.44	3725.63	180598.77	MAS = 10.00 (m)	0.00	0.00			Surface	
3758.39	32.81	3756.32	3725.58	43670.20	MAS = 10.00 (m)	23.00	23.00			WRP	
3755.11	32.81	3750.19	3722.30	1276.04	MAS = 10.00 (m)	690.00	690.00			MinPts	
3755.71	32.81	3749.89	3722.90	978.96	MAS = 10.00 (m)	900.00	900.00			MINPT-O-EOU	
3758.13	32.81	3750.48	3725.32	661.97	MAS = 10.00 (m)	1310.00	1310.00			MINPT-O-EOU	
3733.77	32.81	3719.13	3700.96	295.02	MAS = 10.00 (m)	2830.00	2830.00			MinPts	
3733.84	32.81	3719.08	3701.03	292.34	MAS = 10.00 (m)	2860.00	2860.00			MINPT-O-EOU	
3735.74	32.81	3720.28	3702.93	277.18	MAS = 10.00 (m)	3100.00	3099.98			MinPt-O-SF	
3693.34	32.81	3679.89	3660.53	323.48	MAS = 10.00 (m)	3830.00	3825.55			MinPt-O-SF	
3649.22	32.81	3636.76	3616.41	351.33	MAS = 10.00 (m)	4410.00	4401.23			MinPt-O-SF	
3611.15	32.81	3598.89	3578.35	356.04	MAS = 10.00 (m)	4970.00	4957.94			MinPts	
3611.16	32.81	3598.88	3578.35	355.64	MAS = 10.00 (m)	4980.00	4967.93			MINPT-O-EOU	
3611.24	32.81	3598.94	3578.43	354.86	MAS = 10.00 (m)	5000.00	4987.92			MinPt-O-SF	
3657.53	32.81	3637.45	3624.72	202.78	MAS = 10.00 (m)	7120.00	7107.90			MinPts	
3657.83	32.81	3637.16	3625.03	196.34	MAS = 10.00 (m)	7270.00	7257.90			MINPT-O-EOU	
3945.45	46.93	3913.50	3898.52	131.58	OSF1.50	10230.00	10217.90			MinPt-O-SF	
3962.75	47.13	3930.67	3915.62	131.58	OSF1.50	10280.00	10267.90			MinPt-O-SF	
4634.18	52.70	4598.39	4581.48	137.00	OSF1.50	11710.00	11697.90			MinPt-O-SF	
4764.45	53.33	4728.23	4711.11	139.10	OSF1.50	11950.00	11936.55			MinPt-O-SF	
4948.08	59.20	4907.94	4888.86	129.66	OSF1.50	12930.00	12325.00			MinPt-CtCt	
4948.24	59.75	4907.75	4888.49	128.42	OSF1.50	12980.00	12325.00			MINPT-O-EOU	
4948.54	60.09	4907.82	4888.45	127.68	OSF1.50	13010.00	12325.00			MinPt-O-ADP	
4958.62	64.90	4914.69	4893.72	118.16	OSF1.50	13320.00	12325.00			MinPts	
4962.67	69.44	4915.72	4893.23	110.30	OSF1.50	13500.00	12325.00			MINPT-O-EOU	
4963.19	70.07	4915.81	4893.11	109.29	OSF1.50	13540.00	12325.00			MinPt-O-ADP	
4951.27	81.36	4896.36	4869.90	93.52	OSF1.50	14020.00	12325.00			MinPt-CtCt	
4951.71	82.66	4895.94	4869.05	92.03	OSF1.50	14100.00	12325.00			MINPT-O-EOU	
4952.27	83.32	4896.07	4868.96	91.29	OSF1.50	14140.00	12325.00			MinPt-O-ADP	
4930.72	110.00	4856.73	4820.72	68.44	OSF1.50	15140.00	12325.00			MinPt-CtCt	
4931.12	111.18	4856.34	4819.94	67.70	OSF1.50	15210.00	12325.00			MINPT-O-EOU	
4931.54	111.69	4856.42	4819.85	67.40	OSF1.50	15240.00	12325.00			MinPt-O-ADP	
4950.00	125.08	4865.95	4824.91	60.29	OSF1.50	15690.00	12325.00			MinPt-CtCt	
4949.50	134.86	4858.94	4814.65	55.85	OSF1.50	16040.00	12325.00			MinPt-CtCt	
4948.16	153.93	4844.88	4794.23	48.83	OSF1.50	16710.00	12325.00			MinPt-CtCt	
4949.02	156.71	4843.89	4792.31	47.96	OSF1.50	16840.00	12325.00			MINPT-O-EOU	

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor	Major	
	4950.07	157.96	4844.10	47.58	OSF1.50	16900.00	12325.00				MinPt-O-ADP
	4951.63	167.38	4839.38	44.89	OSF1.50	17180.00	12325.00				MinPt-CtCt
	4949.37	184.49	4825.72	40.86	OSF1.50	17770.00	12325.00				MinPt-CtCt
	4949.42	193.79	4819.57	38.69	OSF1.50	18090.00	12325.00				MinPt-CtCt
	4949.42	199.03	4816.08	37.66	OSF1.50	18270.00	12325.00				MinPt-CtCt
	4942.53	240.25	4781.70	31.10	OSF1.50	19670.00	12325.00				MinPt-CtCt
	4943.44	243.06	4780.74	30.75	OSF1.50	19800.00	12325.00				MINPT-O-EOU
	4941.98	312.59	4732.92	23.86	OSF1.50	22100.00	12325.00				MinPt-CtCt
	4942.21	313.36	4732.64	23.80	OSF1.50	22150.00	12325.00				MINPT-O-EOU
	4942.59	313.81	4732.72	23.77	OSF1.50	22180.00	12325.00				MinPt-O-ADP
	4947.32	315.92	4736.05	23.63	OSF1.50	22332.02	12325.00				MinPt-O-SF

Cimarex Vaca Draw 20-17
Federal #1H Rev0 RM
10Apr17 (Non-Def Plan)

3798.46	32.81	3796.47	3765.65	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
3798.46	32.81	3796.42	3765.65	69743.46	MAS = 10.00 (m)	23.00	23.00				WRP
3658.42	102.80	3589.18	3555.62	54.48	OSF1.50	12230.00	12171.76				MinPt-CtCt
3658.50	103.00	3589.12	3555.50	54.37	OSF1.50	12260.00	12190.98				MINPT-O-EOU
3658.56	103.07	3589.14	3555.43	54.34	OSF1.50	12270.00	12197.06				MinPt-O-ADP
3750.90	107.59	3678.51	3643.30	53.24	OSF1.50	13090.00	12325.00				MinPt-O-SF
3759.93	107.85	3687.36	3652.07	53.24	OSF1.50	13130.00	12325.00				MinPt-O-SF
10713.73	136.14	10622.31	10577.59	119.77	OSF1.50	22332.02	12325.00				TD

Cimarex Vaca Draw 20-17
Federal #5H Final
MWD(Surcon Corrected) (Def
Survey)

3778.45	32.81	3776.46	3745.64	287990.86	MAS = 10.00 (m)	0.00	0.00				Surface
3778.42	32.81	3776.37	3745.61	52525.51	MAS = 10.00 (m)	23.00	23.00				WRP
3776.47	32.81	3772.34	3743.67	1748.29	MAS = 10.00 (m)	530.00	530.00				MinPis
3776.57	32.81	3771.60	3743.76	1261.67	MAS = 10.00 (m)	730.00	730.00				MinPis
3776.85	32.81	3771.22	3744.05	1031.35	MAS = 10.00 (m)	870.00	870.00				MINPT-O-EOU
3778.60	32.81	3769.50	3745.73	530.03	MAS = 10.00 (m)	1640.00	1640.00				MinPis
3778.69	32.81	3769.37	3745.88	514.45	MAS = 10.00 (m)	1690.00	1690.00				MinPis
3804.75	32.81	3769.62	3771.95	289.02	MAS = 10.00 (m)	3100.00	3099.98				MINPT-O-EOU
3780.76	32.81	3767.74	3747.95	342.56	MAS = 10.00 (m)	3860.00	3855.33				MinPt-O-SF
3716.56	32.81	3704.67	3683.75	377.62	MAS = 10.00 (m)	4980.00	4967.93				MinPt-O-SF
3716.56	32.81	3704.66	3683.76	377.62	MAS = 10.00 (m)	4990.00	4977.92				MINPT-O-EOU
3716.59	32.81	3704.67	3683.78	376.51	MAS = 10.00 (m)	5000.00	4987.92				MinPt-O-SF
3737.55	32.81	3721.56	3704.74	267.47	MAS = 10.00 (m)	6140.00	6127.90				MinPis
3737.61	32.81	3721.49	3704.80	265.20	MAS = 10.00 (m)	6170.00	6157.90				MINPT-O-EOU
3758.55	36.99	3733.23	3721.56	161.01	OSF1.50	8350.00	8337.90				MinPt-CtCt
3759.45	38.86	3732.59	3720.30	152.87	OSF1.50	8640.00	8627.90				MINPT-O-EOU
3759.45	39.23	3732.64	3720.22	151.32	OSF1.50	8700.00	8687.90				MinPt-O-ADP
3766.32	43.71	3736.52	3722.61	135.32	OSF1.50	9390.00	9377.90				MINPT-O-EOU
3766.42	43.84	3736.54	3722.59	134.90	OSF1.50	9410.00	9397.90				MinPt-O-ADP
3979.00	51.29	3944.15	3927.71	120.98	OSF1.50	10830.00	10817.90				MinPt-O-SF
4234.60	54.58	4197.56	4180.02	120.70	OSF1.50	11530.00	11517.90				MinPt-O-SF
4312.07	55.56	4274.37	4256.51	110.54	OSF1.50	11720.00	11707.90				MinPt-O-SF
4544.65	63.62	4501.58	4481.03	110.54	OSF1.50	13010.00	12325.00				MinPt-CtCt
4544.95	64.53	4501.26	4480.41	108.93	OSF1.50	13080.00	12325.00				MINPT-O-EOU
4545.51	65.21	4501.38	4480.30	107.79	OSF1.50	13130.00	12325.00				MinPt-O-ADP
4536.69	75.47	4465.72	4461.22	92.55	OSF1.50	13650.00	12325.00				MinPt-CtCt

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)				MD (ft)	TVD (ft)	Alert	Minor		
4537.11	76.54	4485.42	4460.56	91.23	OSF1.50	13720.00	12325.00			MINPT-O-EOU	
4537.82	77.39	4485.57	4460.43	90.22	OSF1.50	13770.00	12325.00			MinPt-O-ADP	
4534.38	94.69	4470.59	4439.69	73.33	OSF1.50	14470.00	12325.00			MinPt-CtCt	
4535.85	99.23	4469.04	4436.62	69.93	OSF1.50	14680.00	12325.00			MINPT-O-EOU	
4537.66	101.41	4469.40	4436.25	68.43	OSF1.50	14780.00	12325.00			MinPt-O-ADP	
4526.61	118.75	4446.78	4407.86	58.12	OSF1.50	15390.00	12325.00			MinPt-CtCt	
4527.16	120.45	4446.20	4406.71	57.30	OSF1.50	15480.00	12325.00			MINPT-O-EOU	
4527.80	121.20	4446.34	4406.60	56.94	OSF1.50	15520.00	12325.00			MinPt-O-ADP	
4533.92	136.12	4442.51	4397.80	50.88	OSF1.50	16050.00	12325.00			MINPT-O-EOU	
4535.40	137.92	4442.79	4397.48	50.02	OSF1.50	16130.00	12325.00			MinPt-O-ADP	
4538.37	141.39	4443.45	4396.98	48.81	OSF1.50	16250.00	12325.00			MINPT-O-EOU	
4528.55	161.82	4420.01	4366.73	42.48	OSF1.50	16930.00	12325.00			MinPt-CtCt	
4528.87	167.87	4416.30	4361.00	40.93	OSF1.50	17140.00	12325.00			MinPt-CtCt	
4521.58	204.18	4384.80	4317.40	33.53	OSF1.50	18390.00	12325.00			MinPt-CtCt	
4525.20	216.17	4380.43	4309.03	31.88	OSF1.50	18800.00	12325.00			MinPt-CtCt	
4526.30	219.34	4379.42	4306.96	31.22	OSF1.50	18940.00	12325.00			MINPT-O-EOU	
4530.95	228.11	4378.22	4302.84	30.04	OSF1.50	19240.00	12325.00			MINPT-O-EOU	
4536.95	241.27	4375.45	4286.68	28.43	OSF1.50	19690.00	12325.00			MINPT-O-EOU	
4528.49	280.10	4341.10	4248.39	24.41	OSF1.50	20960.00	12325.00			MinPt-CtCt	
4531.51	287.27	4339.34	4244.24	23.81	OSF1.50	21240.00	12325.00			MINPT-O-EOU	
4540.43	298.55	4340.74	4241.88	22.95	OSF1.50	21630.00	12325.00			MinPt-O-ADP	
4535.13	314.05	4325.11	4221.08	21.79	OSF1.50	22100.00	12325.00			MinPt-CtCt	
4535.39	314.84	4324.84	4220.55	21.74	OSF1.50	22150.00	12325.00			MINPT-O-EOU	
4535.65	315.15	4324.90	4220.51	21.72	OSF1.50	22170.00	12325.00			MinPt-O-ADP	
4541.00	317.41	4328.73	4223.58	21.58	OSF1.50	22332.02	12325.00			MinPt-O-SF	

Cimarex Vaca Draw 20-17
Federal #1H Surcon 0ft-12740
(Def Survey)

Pass

3798.41	32.81	3796.40	3765.60	109911.71	MAS = 10.00 (m)	0.00	0.00	Surface	
3798.31	32.81	3796.22	3765.50	34948.04	MAS = 10.00 (m)	23.00	23.00	WRP	
3796.42	32.81	3793.25	3763.61	3190.12	MAS = 10.00 (m)	290.00	290.00	MinPls	
3796.88	32.81	3792.87	3764.08	1866.48	MAS = 10.00 (m)	450.00	450.00	MINPT-O-EOU	
3858.90	32.81	3843.73	3826.08	292.51	MAS = 10.00 (m)	3100.00	3099.98	MinPt-O-SF	
3787.86	32.81	3775.95	3755.06	382.57	MAS = 10.00 (m)	4940.00	4927.97	MinPls	
3787.88	32.81	3775.94	3755.07	381.89	MAS = 10.00 (m)	4950.00	4937.96	MINPT-O-EOU	
3788.43	32.81	3776.41	3755.62	378.55	MAS = 10.00 (m)	5000.00	4987.92	MinPt-O-SF	
3909.42	39.03	3882.74	3870.39	158.20	OSF1.50	8490.00	8477.90	MINPT-O-EOU	
3909.83	39.51	3882.83	3870.32	156.19	OSF1.50	8580.00	8567.90	MinPt-O-ADP	
3914.15	45.28	3883.30	3868.86	135.52	OSF1.50	9530.00	9517.90	MinPt-CtCt	
3876.90	62.37	3834.66	3814.53	96.25	OSF1.50	12190.00	12143.96	MinPt-CtCt	
3876.96	62.54	3834.61	3814.42	95.99	OSF1.50	12220.00	12165.04	MINPT-O-EOU	
3877.06	62.65	3834.63	3814.41	95.81	OSF1.50	12240.00	12178.33	MinPt-O-ADP	
4558.89	85.79	4501.04	4473.10	81.58	OSF1.50	14640.00	12325.00	MinPt-O-SF	
10809.66	111.85	10734.43	10697.81	147.56	OSF1.50	22332.02	12325.00	TD	

Cimarex Vaca Draw 20-17
Federal #1H ST01 0ft-21966ft
(Def Survey)

Pass

3798.41	32.81	3797.24	3765.60	109935.51	MAS = 10.00 (m)	0.00	0.00	Surface	
3798.31	32.81	3797.07	3765.50	34955.59	MAS = 10.00 (m)	23.00	23.00	WRP	
3796.42	32.81	3794.10	3763.61	3190.83	MAS = 10.00 (m)	290.00	290.00	MinPls	
3796.88	32.81	3793.72	3764.08	1866.89	MAS = 10.00 (m)	450.00	450.00	MINPT-O-EOU	
3858.90	32.81	3844.58	3826.08	292.57	MAS = 10.00 (m)	3100.00	3099.98	MinPt-O-SF	

Offset Trajectory	Separation		Allow Dev. (ft)	Sep. Fact.	Controlling Rule	Reference Trajectory		Risk Level		Alert	Status
	Ct-Ct (ft)	MAS (ft)	EOU (ft)			MD (ft)	TVD (ft)	Alert	Minor	Major	
3787.86	32.81	3776.80	3755.06	382.66	MAS = 10.00 (m)	4940.00	4927.97			MinPls	
3787.88	32.81	3776.79	3755.07	381.97	MAS = 10.00 (m)	4950.00	4937.96			MinPt-O-EOU	
3788.43	32.81	3777.26	3755.62	378.64	MAS = 10.00 (m)	5000.00	4987.92			MinPt-O-SF	
3909.42	38.18	3883.58	3871.24	158.23	OSF1.50	8490.00	8477.90			MinPt-O-EOU	
3909.83	38.66	3883.68	3871.17	156.23	OSF1.50	8580.00	8567.90			MinPt-O-ADP	
3914.15	44.43	3884.15	3869.71	135.55	OSF1.50	9530.00	9517.90			MinPt-CtCt	
3882.93	59.32	3843.00	3823.61	100.06	OSF1.50	11800.00	11787.90			MinPt-CtCt	
3883.22	59.94	3842.88	3823.28	99.02	OSF1.50	11900.00	11887.62			MinPt-O-EOU	
3883.36	60.11	3842.91	3823.25	98.74	OSF1.50	11930.00	11917.11			MinPt-O-ADP	
3883.97	60.66	3843.16	3823.32	97.85	OSF1.50	12030.00	12011.85			MinPt-CtCt	
3872.49	66.04	3828.09	3806.45	89.47	OSF1.50	12750.00	12322.93			MinPt-CtCt	
3872.61	66.43	3827.94	3806.18	88.93	OSF1.50	12790.00	12324.52			MinPt-O-EOU	
3873.22	67.71	3827.71	3805.52	87.24	OSF1.50	12890.00	12325.00			MinPt-O-EOU	
3873.50	68.05	3827.76	3805.45	86.80	OSF1.50	12920.00	12325.00			MinPt-O-ADP	
3873.05	73.83	3823.45	3799.22	79.88	OSF1.50	13280.00	12325.00			MinPt-CtCt	
3866.83	79.94	3813.16	3786.89	73.58	OSF1.50	13610.00	12325.00			MinPt-CtCt	
3867.10	80.86	3812.81	3786.24	72.73	OSF1.50	13670.00	12325.00			MinPt-O-EOU	
3867.61	81.48	3812.92	3786.13	72.18	OSF1.50	13710.00	12325.00			MinPt-O-ADP	
3875.52	90.58	3814.75	3784.93	64.97	OSF1.50	14120.00	12325.00			MinPt-CtCt	
3869.83	104.87	3799.54	3764.96	55.94	OSF1.50	14730.00	12325.00			MinPt-CtCt	
3870.71	107.38	3798.75	3763.33	54.63	OSF1.50	14850.00	12325.00			MinPt-O-EOU	
3871.79	108.64	3798.98	3763.15	54.00	OSF1.50	14910.00	12325.00			MinPt-O-ADP	
3850.53	145.23	3753.33	3705.30	40.07	MAS = 10.00 (m)	16270.00	12325.00			MinPt-CtCt	
3851.34	147.71	3752.49	3703.63	39.40	OSF1.50	16380.00	12325.00			MinPt-O-EOU	
3853.45	152.41	3751.47	3701.05	38.20	OSF1.50	16550.00	12325.00			MinPt-O-EOU	
3854.62	153.81	3751.70	3700.81	37.86	OSF1.50	16610.00	12325.00			MinPt-O-ADP	
3857.24	156.85	3752.30	3700.39	37.15	OSF1.50	16720.00	12325.00			MinPt-O-ADP	
3868.75	165.08	3758.32	3703.67	35.39	OSF1.50	17020.00	12325.00			MinPt-O-EOU	
3869.78	173.09	3754.01	3696.69	33.75	OSF1.50	17280.00	12325.00			MinPt-CtCt	
3872.62	180.71	3751.77	3691.91	32.34	OSF1.50	17550.00	12325.00			MinPt-O-EOU	
3874.24	182.64	3752.10	3691.60	32.01	OSF1.50	17630.00	12325.00			MinPt-CtCt	
3855.14	214.85	3711.53	3640.29	27.05	OSF1.50	18710.00	12325.00			MinPt-O-ADP	
3855.78	216.80	3710.88	3638.97	26.81	OSF1.50	18800.00	12325.00			MinPt-O-EOU	
3856.50	217.66	3711.02	3638.84	26.71	OSF1.50	18840.00	12325.00			MinPt-O-ADP	
3879.11	235.44	3721.77	3643.67	24.83	OSF1.50	19410.00	12325.00			MinPt-CtCt	
3841.73	261.88	3666.76	3579.84	22.09	OSF1.50	20310.00	12325.00			MinPt-CtCt	
3842.92	265.27	3665.70	3577.65	21.82	OSF1.50	20450.00	12325.00			MinPt-O-EOU	
3844.60	267.23	3666.07	3577.37	21.67	OSF1.50	20530.00	12325.00			MinPt-O-ADP	
3861.28	280.93	3673.61	3580.34	20.89	OSF1.50	20990.00	12325.00			MinPt-O-EOU	
3862.04	281.73	3673.85	3580.31	20.64	OSF1.50	21020.00	12325.00			MinPt-O-ADP	
3864.03	291.91	3669.05	3572.12	19.93	OSF1.50	21320.00	12325.00			MinPt-CtCt	
3866.26	299.11	3666.48	3567.15	19.46	OSF1.50	21590.00	12325.00			MinPt-O-EOU	
3868.57	302.65	3666.43	3565.92	19.24	OSF1.50	21750.00	12325.00			MinPt-O-EOU	
3869.38	303.60	3666.61	3565.78	19.18	OSF1.50	21750.00	12325.00			MinPt-O-ADP	
3871.37	315.15	3660.89	3556.21	18.49	OSF1.50	22100.00	12325.00			MinPt-CtCt	
3871.68	316.06	3660.60	3555.62	18.44	OSF1.50	22150.00	12325.00			MinPt-O-EOU	
3871.99	316.41	3660.67	3555.58	18.42	OSF1.50	22170.00	12325.00			MinPt-O-ADP	
3878.29	318.95	3665.27	3559.33	18.30	OSF1.50	22332.02	12325.00			MinPt-O-SF	



Cimarex Energy Offline Cementing 7-5/8" Casing Information
for Sundry Approval Plan REV0



CIMAREX ENERGY CO. NYSE LISTED: XEC

Cementing Operational Workflow

Conventional Cementing		Offline Cementing	
1.	Land casing on fluted mandrel hanger	1.	Land casing on <u>solid body</u> mandrel hanger
2.	Circulate down casing, taking returns through BOP stack	a)	Engage packoff and locking
3.	Pump lead and tail cement	2.	Install BPV
4.	Displace cement and bump the plug	3.	Skid rig
5.	Ensure floats are holding pressure	4.	Check for pressure and remove BPV
6.	RD cement crew	5.	Circulate down casing, taking returns through casing valves
7.	Install packoff to isolate pressure	6.	Pump lead and tail cement
8.	Install BPV and skid rig	7.	Displace cement and bump the plug
		8.	Ensure floats are holding pressure
		9.	RD cement crew
		10.	Install BPV and TA cap

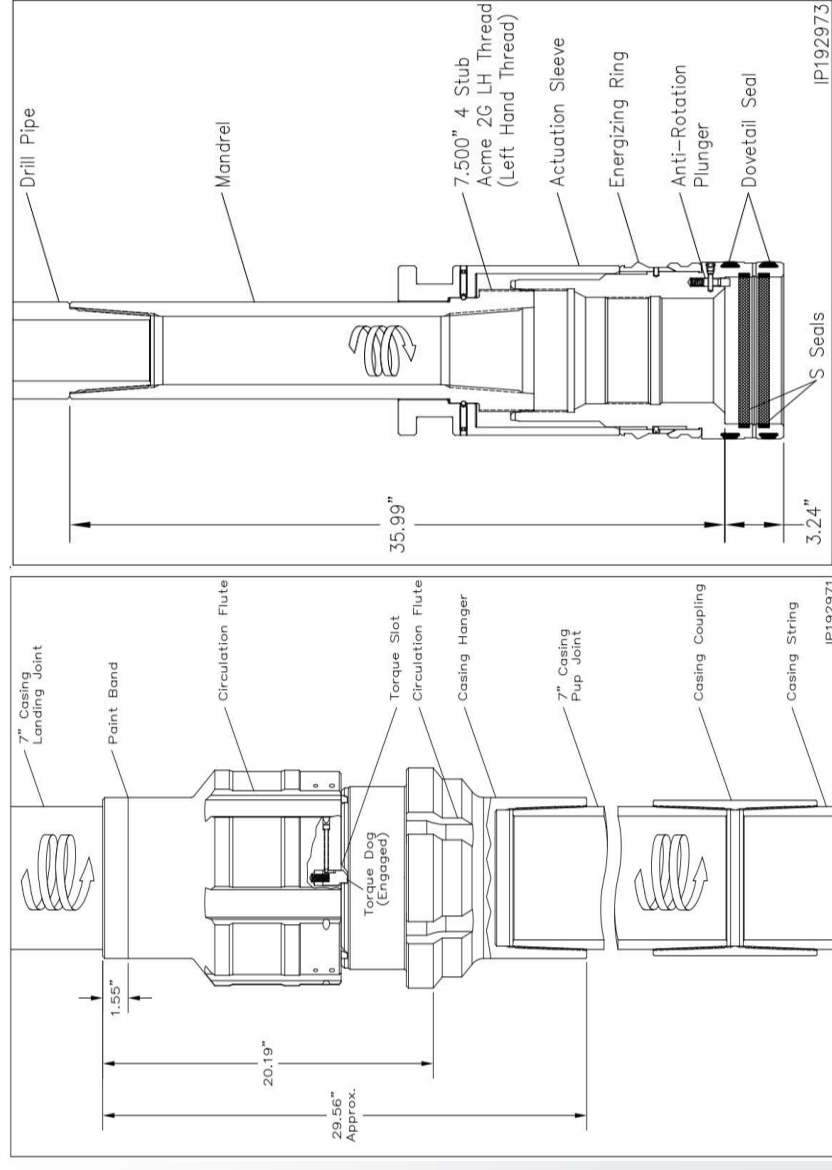


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SLIDE TITLE HERE | 2

Conventional Cementing Equipment-Fluted Mandrel

- Fluted Hanger allows returns up past the hanger body
- Returns throughout cement job flow up through BOP stack and into flowline
- Packoff is installed **after** cement job to isolate pressure above and below hanger
- Lockring engaged during packoff installation

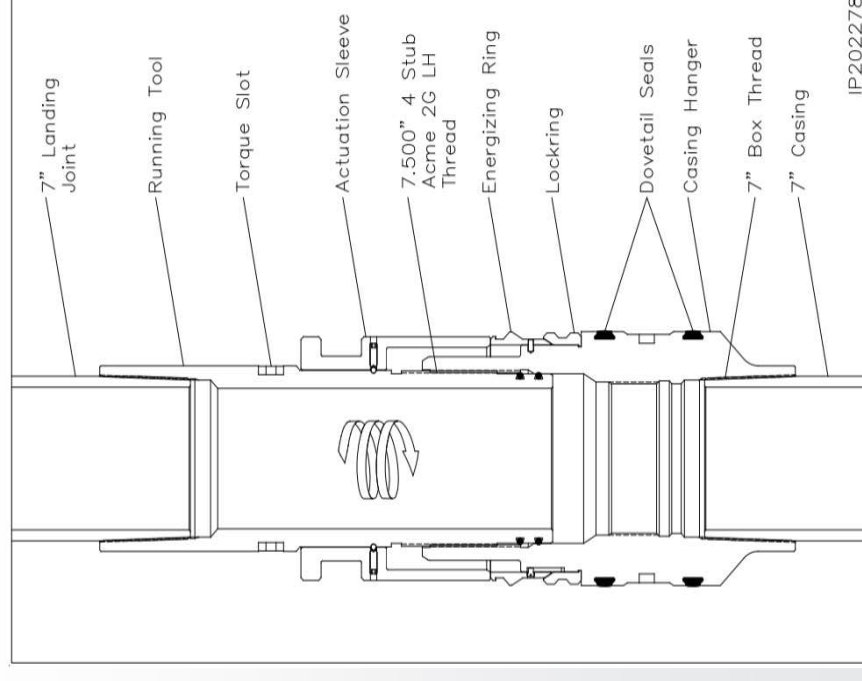


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Offline Cementing Equipment-Solid Body Mandrel Hanger

- Solid Body Mandrel Hanger allows for casing to be landed and pressure isolated in one step, **prior** to cementing
- Lockring is engaged to lock casing in place
- Casing is isolated and returns throughout cement job flow through the casing valves and through flowback iron independent of rig



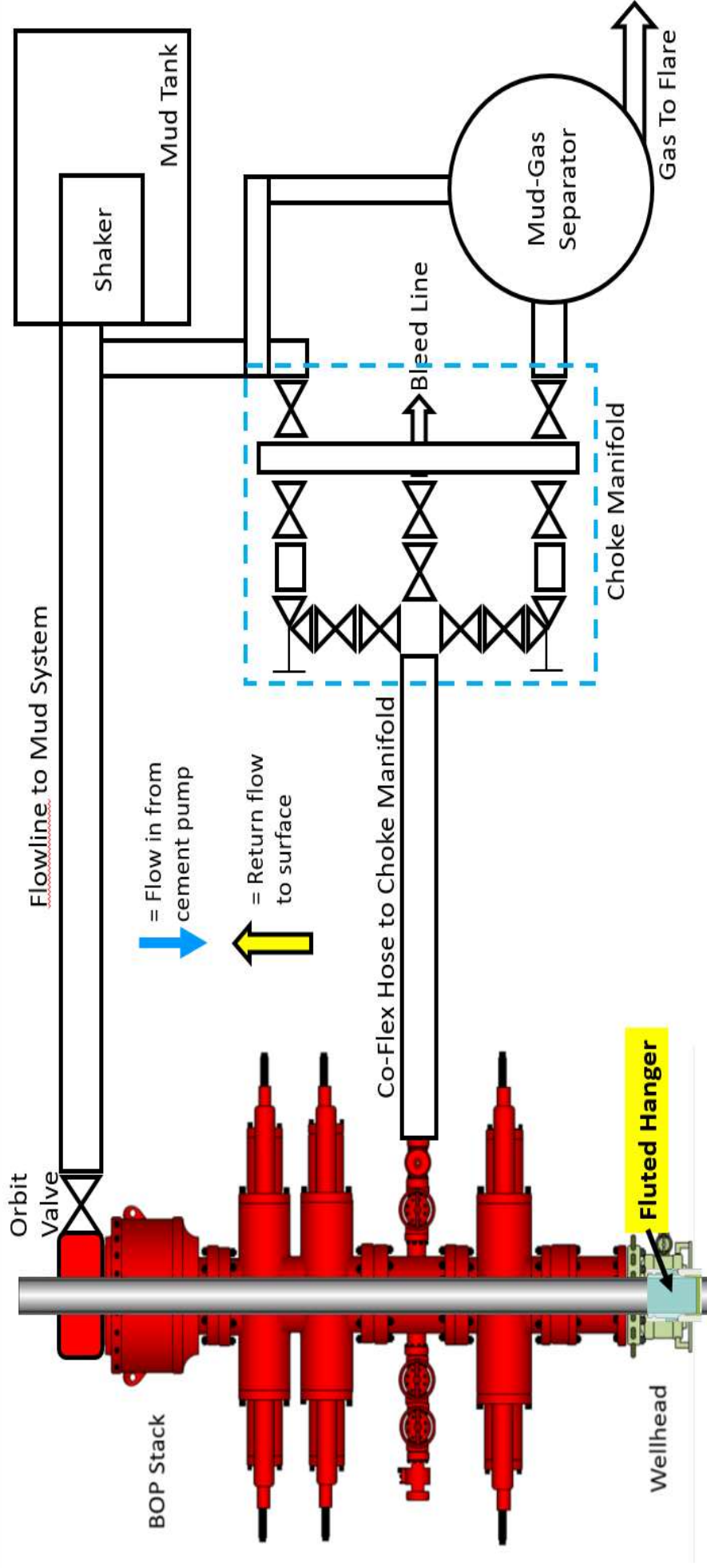
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Conventional Cementing Flow Diagram

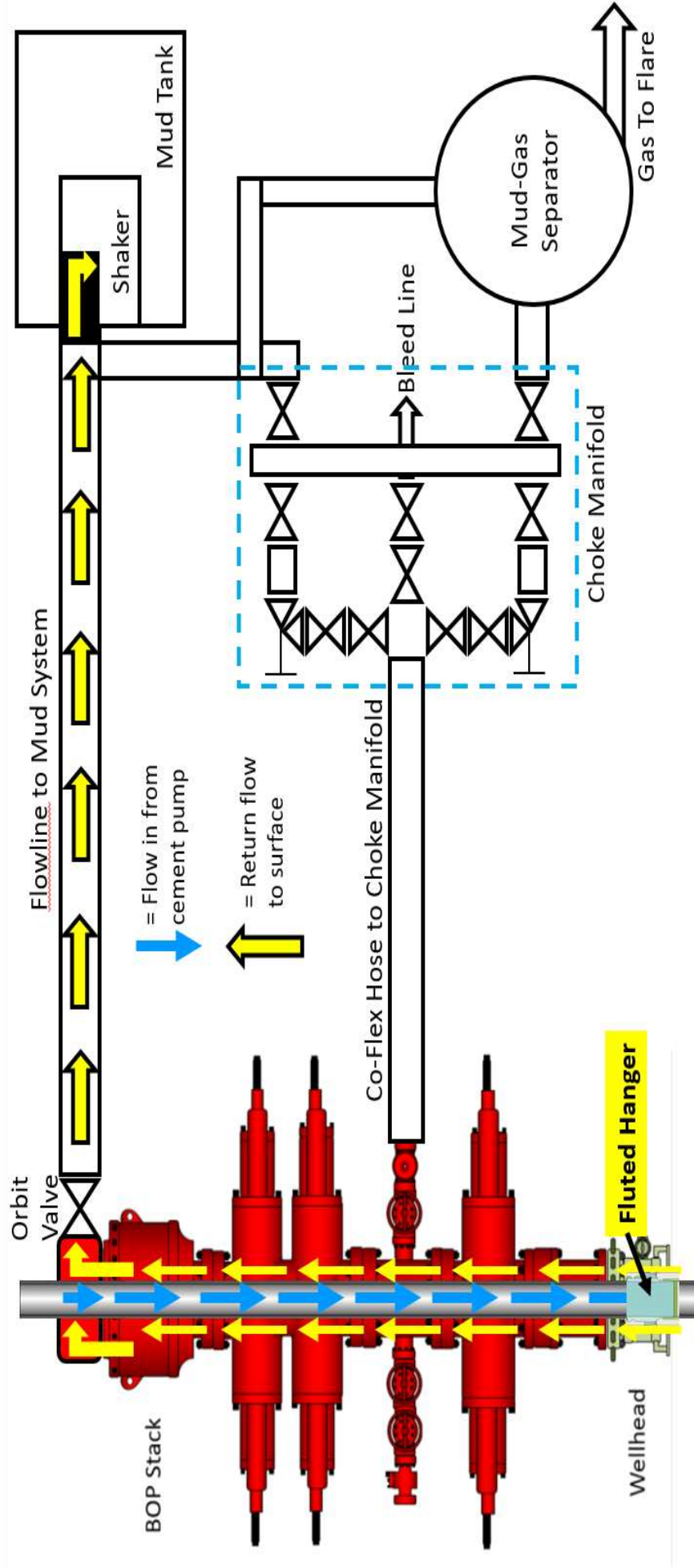


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Conventional Cementing Flow Diagram

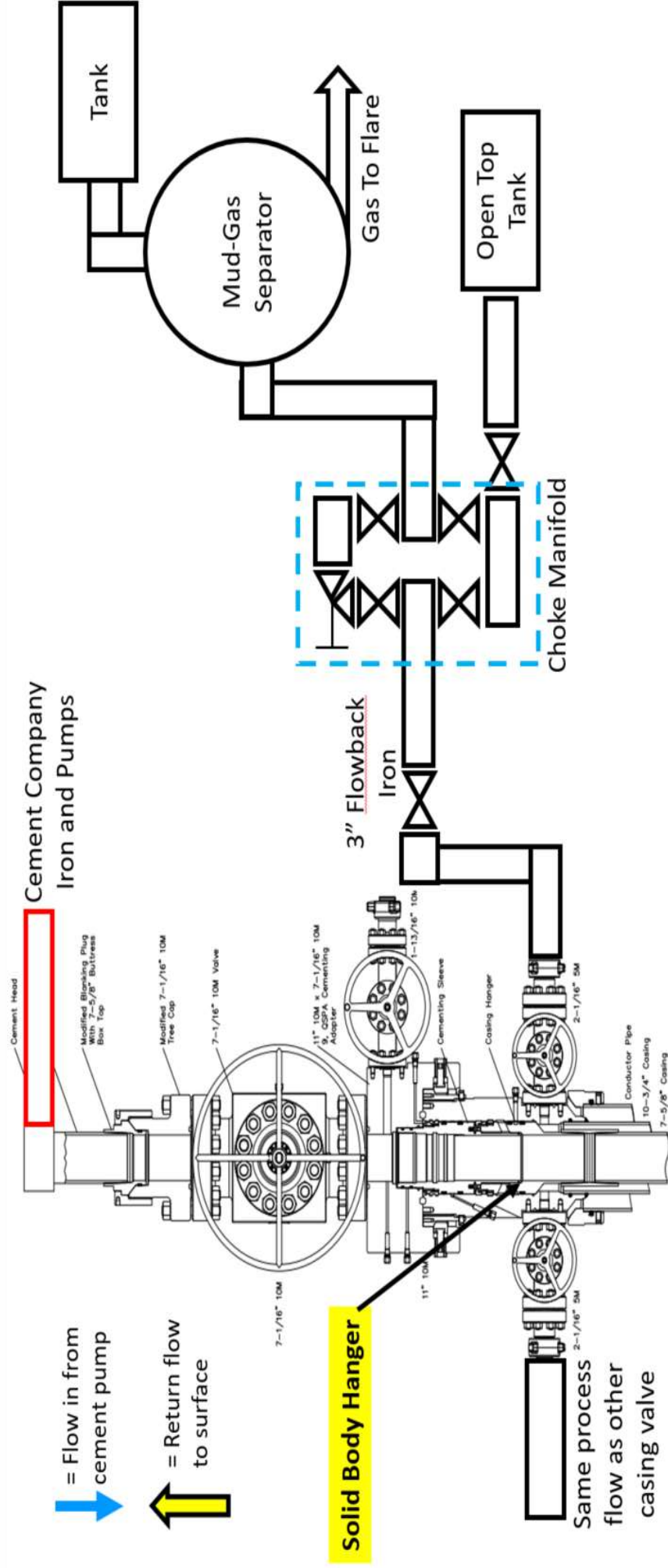


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Offline Cementing Flow Diagram

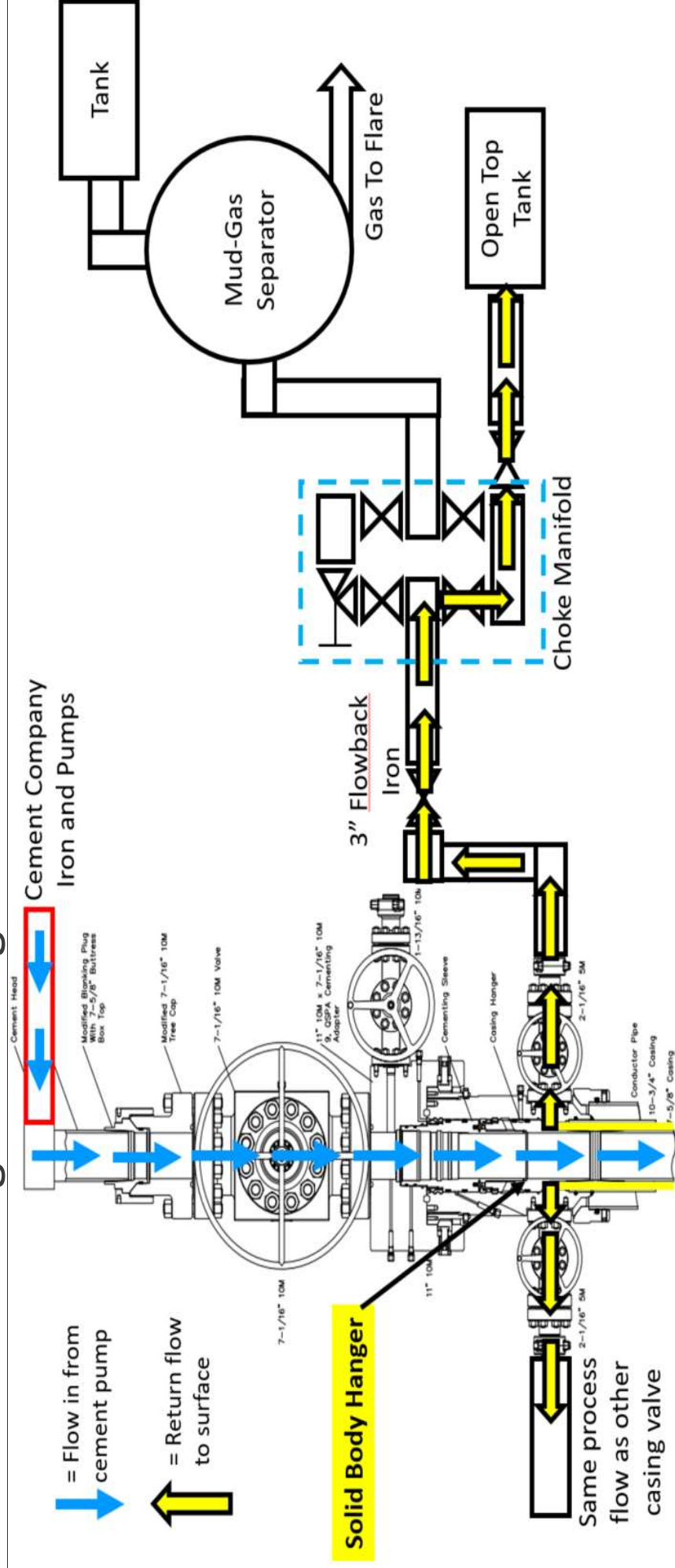


CIMAREX ENERGY CO. NYSE LISTED: XEC



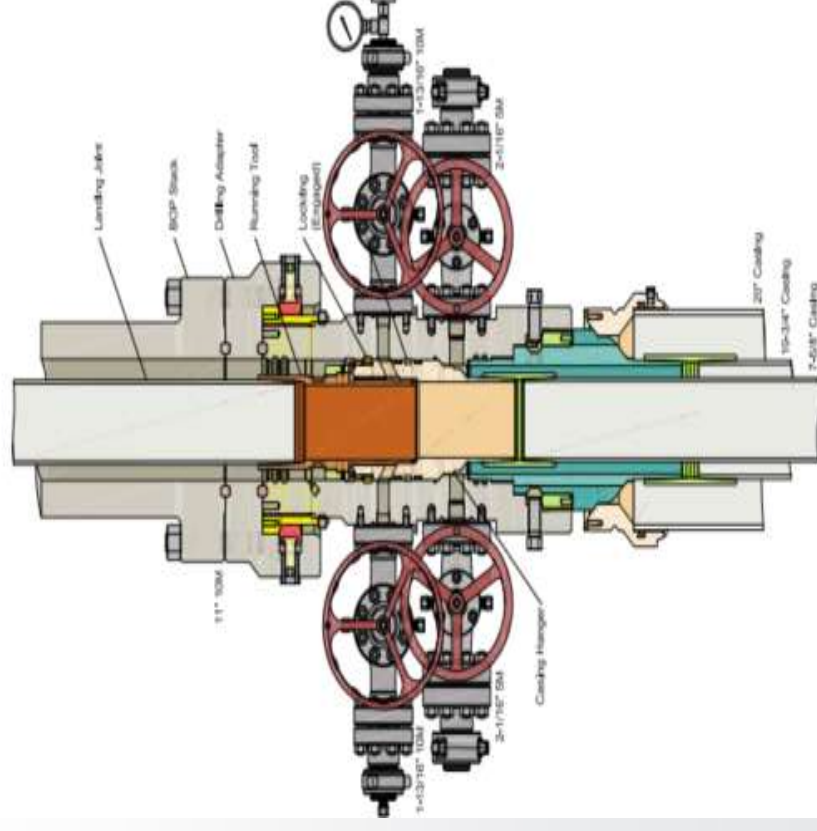
SLIDE TITLE HERE | 7

Offline Cementing Flow Diagram



Offline Cementing Progression

- Run 7-5/8 casing
- Land 11" nominal x 7-5/8 hanger
- Test casing hanger
- Energize 11" nom x 7-5/8 hanger lock ring and pull test
- Re-test casing hanger
- Barriers & Procedures after landing casing before setting packoff
 - 10K BOP & 5K Annular-Internal and Annular barrier
 - Kill Weight Fluid in annulus and casing (ensure well is static before setting solid body packoff) Internal and Annular barrier
 - **If well is not static we WILL NOT set solid body packoff.**
 - 10K float collar-Internal Barrier
 - 10k float Shoe-Internal Barrier
- **After circulating a 1.5 casing capacities to ensure full column of mud and no entrained gas pumps will be shut off and floats checked for flow**

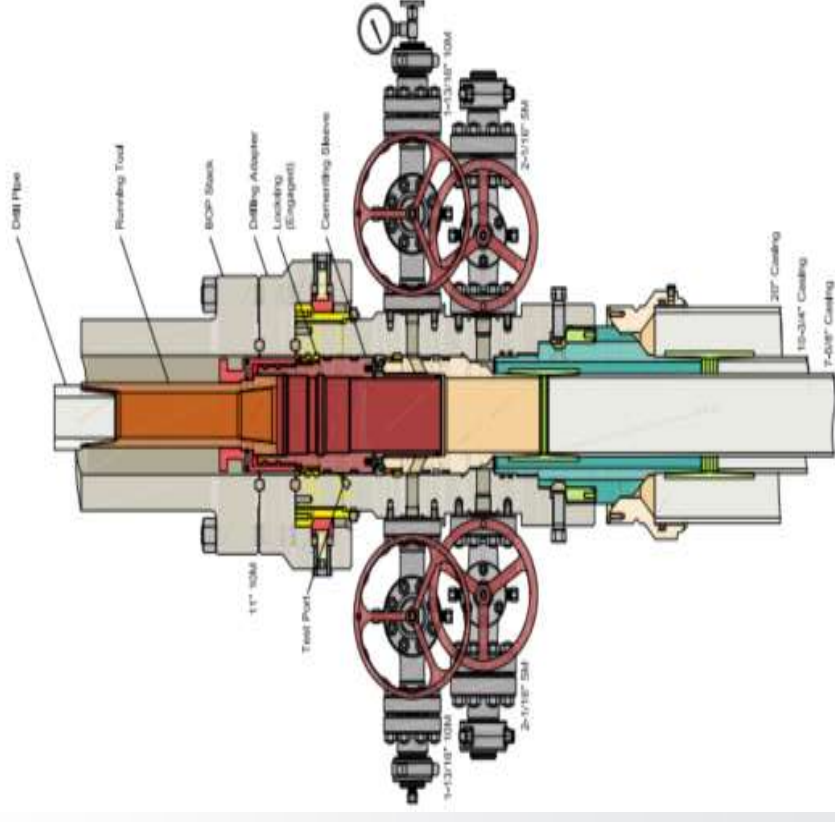


CIMAREX ENERGY CO. NYSE LISTED: XEC

SLIDE TITLE HERE | 9

Offline Cementing Progression

- Pick up Cementing sleeve and running tool and run into well
- Test cementing sleeve
- Energize cementing sleeve lock ring and pull test
- Remove running tool
- Pick up running tool with 7" nominal Back Pressure valve run into well and set
- Barriers and procedures **BEFORE** removing BOP's
 - Kill weight Fluid in annulus-Annular Barrier
 - Solid Body Packoff-Annular Barrier
 - 10K Float Equipment-Internal Barrier
 - 10K Back pressure valve installed with BOP still on well-Internal Barrier
 - BPV will be tested before it arrives on location by Cactus

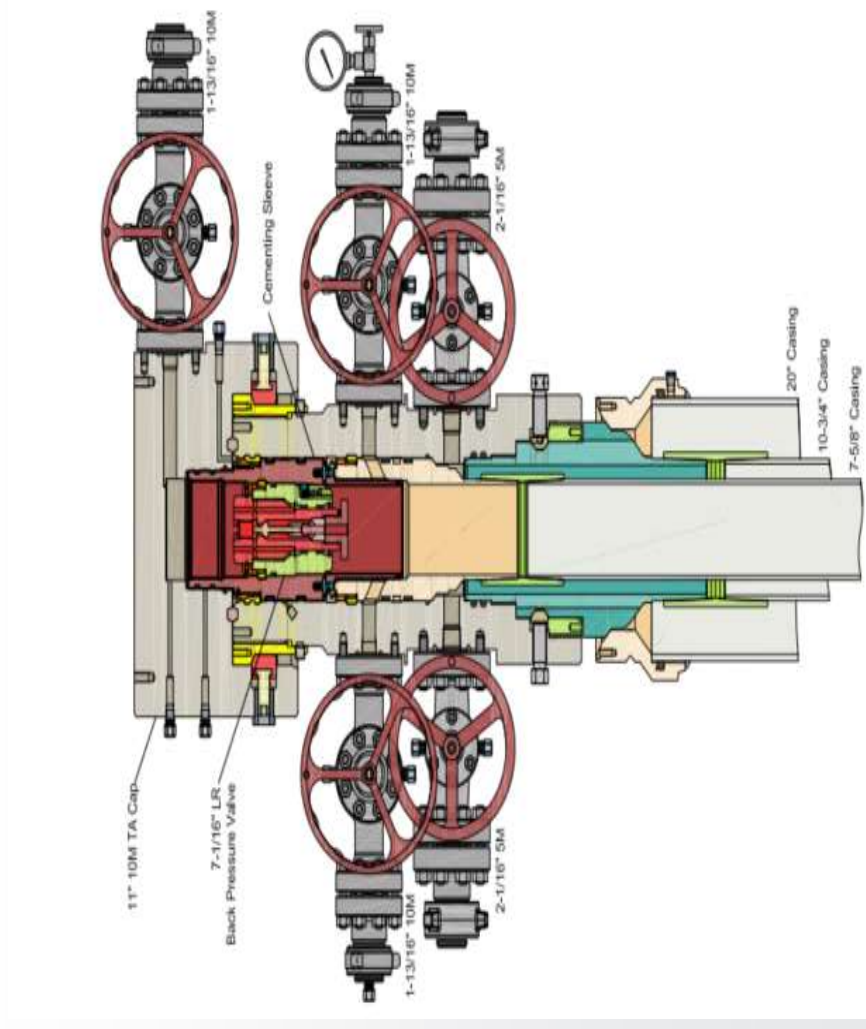


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Offline Cementing Progression

- Nipple down BOP
- Nipple up TA Cap and test
- Skid Drilling Rig
- Barriers and procedures **AFTER** removing BOP's
 - Kill weight Fluid in annulus-Annular Barrier
 - Solid Body Packoff-Annular Barrier
 - 10K Float Equipment-Internal Barrier
 - 10K Back pressure valve-Internal Barrier
 - 10K rated TA cap with Valve-Internal Barrier

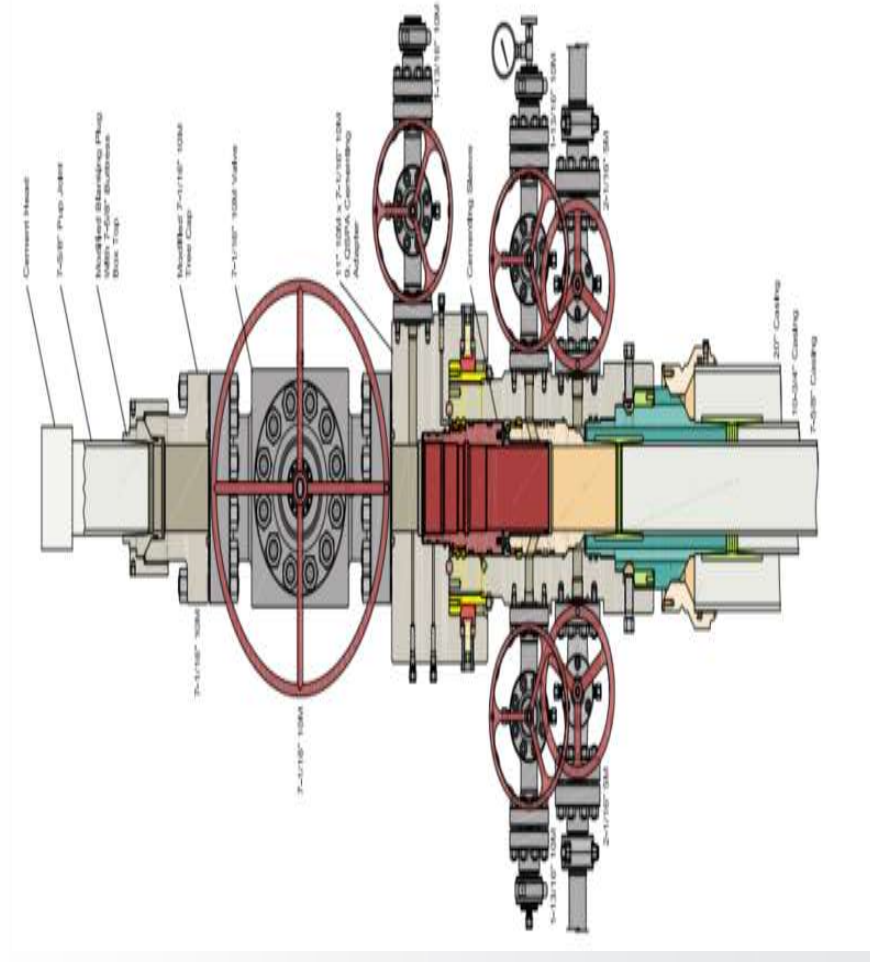


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Offline Cementing Progression

- Check Pressure on TA Cap and remove
- Install adaptor with Gate valve for off line cementing and test
- Rig up flowback iron independent of rig
- Retrieve Back Pressure Valve
- Shut in well
- Rig up to cement and pump job
- NU 10K TA cap after cement job
- Barriers and procedures before **rigging up cementing equipment**
 - **Address well and ensure no pressure on TA cap**
 - **Ability to pump into well through casing valves on backside to kill if needed**
- Kill weight Fluid in annulus-Annular barrier
- Solid Body Packoff-Annular barrier
- 10K Float Equipment-Internal Barrier
- 10K Back pressure valve-Internal Barrier



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Offline Cementing Risk and COA Compliance

- All testing and breaks tested in accordance with Onshore Order # 2 and COA's
- If no cement to surface, bradenhead squeeze still possible with offline cementing equipment
- Time from skid rig to offline cementing ops typically 24 hours
- **Conditions where we would not Offline Cement**
 - Well is flowing
- All wellhead equipment rated to 10K maintaining APD compliant
 - 10K flowback iron independent of rig circulating system
 - 10K Back Pressure Valve
 - 10K Gate Valve & TA combo for second barrier during operations
 - 10K 1-13/16 Valve coming off TA cap
 - 10K TA Cap



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Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
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CONDITIONS

Action 19635

CONDITIONS OF APPROVAL

Operator: CIMAREX ENERGY CO. Suite 600 Midland, TX79701	600 N. Marienfeld Street	OGRID: 215099	Action Number: 19635	Action Type: C-103A
OCD Reviewer pkautz	Condition None			