

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546121	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: 01:51
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 59H well. Proposed BHL: 100' FNL & 355' 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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Section 1 - General

APD ID: 10400034516	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		
Operator PO Box:		Zip: 79701
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:	
Well Name: VACA DRAW 20-17 FEDERAL	Well Number: 59H	Well API Number: 3002546121
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 Number: E2E2 PAD 1	
Well Class: HORIZONTAL	DRAW 20-17 FEDERAL Number of Legs: 1	
Well Work Type: Drill		
Well Type: OIL WELL		
Describe Well Type:		

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COMPANY

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_59H_C102_Plat_20180928072526.pdf
C102_VacaDraw_2017_Fed_59H_20210218194246.pdf

Well work start Date: 03/16/2020

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	880	FEL	25S	33E	20	Aliquot SESE	32.109897	-103.588611	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	3399	0	0	Y
KOP Leg #1	230	FSL	355	FEL	25S	33E	20	Aliquot SESE	32.109453	-103.586917	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-8611	12047	12010	Y
PPP Leg #1-1	390	FSL	355	FEL	25S	33E	20	Aliquot SESE	32.109895	-103.586916	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-8968	12451	12367	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	355	FEL	25S	33E	17	Aliquot NENE	32.137577	-103.586898	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-9121	22554	12520	Y
BHL Leg #1	100	FNL	355	FEL	25S	33E	17	Aliquot NENE	32.137577	-103.586898	LEA	NEW MEXICO	NEW MEXICO	F	NMNM026394	-9121	22554	12520	Y

Drilling Plan

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1611391	RUSTLER	3421	935	935		USEABLE WATER	N
1611392	SALADO	2123	1298	1298		NONE	N
1611390	CASTILE	-1293	4714	4714		NONE	N
1611382	LAMAR	-1488	4909	4909		NONE	N
1611387	BELL CANYON	-1516	4937	4937		NONE	N
1611388	CHERRY CANYON	-2569	5990	5990		NONE	N
1611389	BRUSHY CANYON	-4115	7536	7536		NATURAL GAS, OIL	N
1611385	BONE SPRING	-5611	9032	9032		NATURAL GAS, OIL	Y
1611393	BONE SPRING 1ST	-6590	10011	10011		NATURAL GAS, OIL	N
1611383	BONE SPRING 2ND	-7162	10583	10583		NATURAL GAS, OIL	N
1611386	BONE SPRING 3RD	-8301	11722	11722		OIL	N
1611384	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: 19839

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

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BOP Diagram Attachment:

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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	H-40	48	ST&C	1.64	3.84	BUOY	6.81	BUOY
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4917	0	4917	0		4917	J-55	40	LT&C	1.46	1.51	BUOY	2.64	BUOY
3	PRODUCTION	8.75	5.5	NEW	API	N	0	9492	0	9492	0		9492	L-80	20	LT&C	1.99	2.07	BUOY	2.09	BUOY
4	PRODUCTION	8.75	5.5	NEW	API	N	9492	19839	9492	9940	9492	19839	10347	L-80	20	BUTT	1.9	1.93	BUOY	52.01	BUOY

Casing Attachments

Casing ID: 1 String Type: SURFACE

Inspection Document:

Spec Document:

Vaca_Draw_20_17_Fed_59H_Surf_Casing_Spec_Sheet_20181003075124.pdf

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_59H_Casing_Assumptions_20181003075300.pdf

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Casing Attachments

Casing ID: 2 String Type:INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_59H_Casing_Assumptions_20181003075331.pdf

Casing ID: 3 String Type:PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_59H_Casing_Assumptions_20181003080210.pdf

Casing ID: 4 String Type:PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Vaca_Draw_20_17_Fed_59H_Casing_Assumptions_20181003081017.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	483	3.64	10.3	1756	50	Tuned Light	LCM
INTERMEDIATE	Tail		0	4917	288	1.34	14.8	385	25	Class C	LCM
PRODUCTION	Lead		0	9492	412	3.64	10.3	1497	25	Tuned Light	LCM
PRODUCTION	Tail		0	9492	2213	1.3	14.2	2876	10	50:50 (Poz:H)	Salt, Bentonite, Fluid Loss, Dispersant, SMS
PRODUCTION	Lead		9492	1983 9	412	3.64	10.3	1497	25	Tuned Light	LCM
PRODUCTION	Tail		9492	1983 9	2213	1.3	14.2	2876	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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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
4917	1983 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: 1896

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_59H_H2S_Plan_20181003080034.pdf

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Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Vaca_Draw_20_17_Fed_59H_Directional_Plan_20181003080049.pdf
Vaca_Draw_20_17_Fed_59H_AC_Report_20181003080048.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

Vaca_Draw_20_17_Fed_59H_Gas_Capture_Plan_20181003080118.pdf
Vaca_Draw_20_17_Fed_59H_Flex_Hose_20181003080117.pdf
Vaca_Draw_20_17_Fed_59H_Drilling_Plan_20181003080152.pdf

Other Variance attachment:

Vaca_Draw_20_17_Fed_59H_Multibowl_Procedure_20181003080141.pdf
Vaca_Draw_20_17_Fed_59H_Multibowl_Wellhead_20181003080142.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_20190201102638.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_20190305094642.pdf
Vaca_Draw_20_17_Fed_East_Zone_1_2_CTB_Road_ROW_20190305094645.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_20190305094642.pdf

Vaca_Draw_20_17_Fed_East_Zone_1_2_CTB_Road_ROW_20190305094645.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:
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Drainage Control

New road drainage crossing:

Drainage Control comments:

Road Drainage Control Structures (DCS) description:

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546121	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_20190305094642.pdf

Vaca_Draw_20_17_Fed_East_Zone_1_2_CTB_Road_ROW_20190305094645.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 / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546121	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_20181003074823.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_1_CTB_Battery_Layout_20190305094724.pdf

Vaca_Draw_20_17_Fed_East_Zone_2_CTB_Battery_Layout_20190305094729.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_20180928072853.pdf

Water source comments:

New water well? NO

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546121	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

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
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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:

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.109897 / -103.588611	County or Parish/State: LEA / NM
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Section 9 - Well Site Layout

Well Site Layout Diagram:

Vaca_Draw_20_17_Fed_59H_Wellsite_Layout_20180928072926.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_20180928072941.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: 4619 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 / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546121	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

Seed Type	Pounds/Acre
-----------	-------------

Total 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

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
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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:

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546121	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

Fee Owner: Hughes Properties LL C (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 Operator Land Owner Agreement Attachment
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 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_59H_SUPO_20190305101058.pdf
Vaca_Draw_20_17_Fed_59H_Operator_Land_Owner_Agmt_20190131105438.pdf
Vaca_Draw_20_17_Fed_East_Zone_1_2_CTB_SWD_ROW_20190305101105.pdf
Vaca_Draw_20_17_Fed_E2E2_Pad_1_Flow_Gas_lift_ROW_20190305101100.pdf
Vaca_Draw_20_17_Fed_E2E2_Pad_1_Public_Access_20180928073021.pdf
Vaca_Draw_20_17_Fed_Temp_Water_Route_20180928073028.pdf
Vaca_Draw_20_17_Fed_E2E2_Pad_1_Road_Description_20180928073022.pdf
Vaca_Draw_59H_Pkt_for_Jeff__1_20190305101118.pdf
Vaca_Draw_59H_Pkt_for_Jeff__2_20190305101128.pdf
Vaca_Draw_20_17_Fed_East_Zone_1_2_CTB_Gas_Sales_ROW_20190305101102.pdf

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Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546121	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:

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
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US Well Number: 3002546121	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 Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546121	Well Status: Approved Application for Permit to Drill	Operator: CIMAREX ENERGY COMPANY

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 / 32.109897 / -103.588611	County or Parish/State: LEA / NM
Well Number: 59H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM026394, NMNM26394	Unit or CA Name:	Unit or CA Number:
US Well Number: 3002546121	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

Vaca_Draw_2017_Fed_59H_Sundry_attachment_all_20210218193958.pdf

Well Name: VACA DRAW 20-17 FEDERAL	Well Location: T25S / R33E / SEC 20 / SESE / 32.109897 / -103.588611	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: 3002546121	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 01:51 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 12,520

Pilot Hole TD N/A

MD at TD 22,554

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	12672	12471	7-5/8"	29.70	L-80	BT&C	2.45	1.18	1.79
6 3/4	0	12000	12000	5-1/2"	23.00	L-80	BT&C	1.40	1.13	2.35
6 3/4	12000	22554	12520	5"	18.00	P-110	BT&C	1.61	1.63	61.97
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 59H

	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	600	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	1361	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'	Fresh Water	7.83 - 8.33	28	N/C
985' to 12672'	Brine Diesel Emulsion	8.50 - 9.00	30-35	N/C
12672' to 22554'	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	8333 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 30-025-46121		² Pool Code 98180	³ Pool Name WC-025 G-09 S253309P;UPR WOLFCAMP	
⁴ Property Code 319775	⁵ Property Name VACA DRAW 20-17 FEDERAL			⁶ Well Number 59H
⁷ OGRID No. 215099	⁸ Operator Name CIMAREX ENERGY CO.			⁹ Elevation 3398.6'

¹⁰ Surface Location

UL or lot no. P	Section 20	Township 25S	Range 33E	Lot Idn	Feet from the 390	North/South line SOUTH	Feet from the 880	East/West line EAST	County LEA
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¹¹ Bottom Hole Location If Different From Surface

UL or lot no. A	Section 17	Township 25S	Range 33E	Lot Idn	Feet from the 100	North/South line NORTH	Feet from the 355	East/West line EAST	County LEA
¹² Dedicated Acres 640		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

S C A L E

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

LINE TABLE		
LINE	DIRECTION	LENGTH
L1	N89°57'00"E	524.94'
L2	S89°56'49"W	2644.60'

NAD 83 (SHL)
LATITUDE = 32°06'35.63" (32.109897°)
LONGITUDE = 103°35'19.00" (103.588611°)
NAD 27 (SHL)
LATITUDE = 32°06'35.18" (32.109773°)
LONGITUDE = 103°35'17.30" (103.588139°)
STATE PLANE NAD 83 (N.M. EAST)
N: 404513.62' E: 771919.71'
STATE PLANE NAD 27 (N.M. EAST)
N: 404455.84' E: 730733.53'

NAD 83 (LP/FTP)
LATITUDE = 32°06'35.62" (32.109895°)
LONGITUDE = 103°35'12.90" (103.586916°)
NAD 27 (LP/FTP)
LATITUDE = 32°06'35.17" (32.109770°)
LONGITUDE = 103°35'11.20" (103.586444°)
STATE PLANE NAD 83 (N.M. EAST)
N: 404516.27' E: 772444.55'
STATE PLANE NAD 27 (N.M. EAST)
N: 404458.49' E: 731258.37'

NAD 83 (LTP/BHL)
LATITUDE = 32°08'15.28" (32.137577°)
LONGITUDE = 103°35'12.83" (103.586988°)
NAD 27 (LTP/BHL)
LATITUDE = 32°08'14.83" (32.137453°)
LONGITUDE = 103°35'11.13" (103.586425°)
STATE PLANE NAD 83 (N.M. EAST)
N: 414586.85' E: 772380.16'
STATE PLANE NAD 27 (N.M. EAST)
N: 414528.82' E: 731194.44'

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)

**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.

Fatima Vasquez 3/9/2021
Signature Date

Fatima Vasquez

Printed Name

fvasquez@cimarex.com
E-mail Address

**18 SURVEYOR
CERTIFICATION**

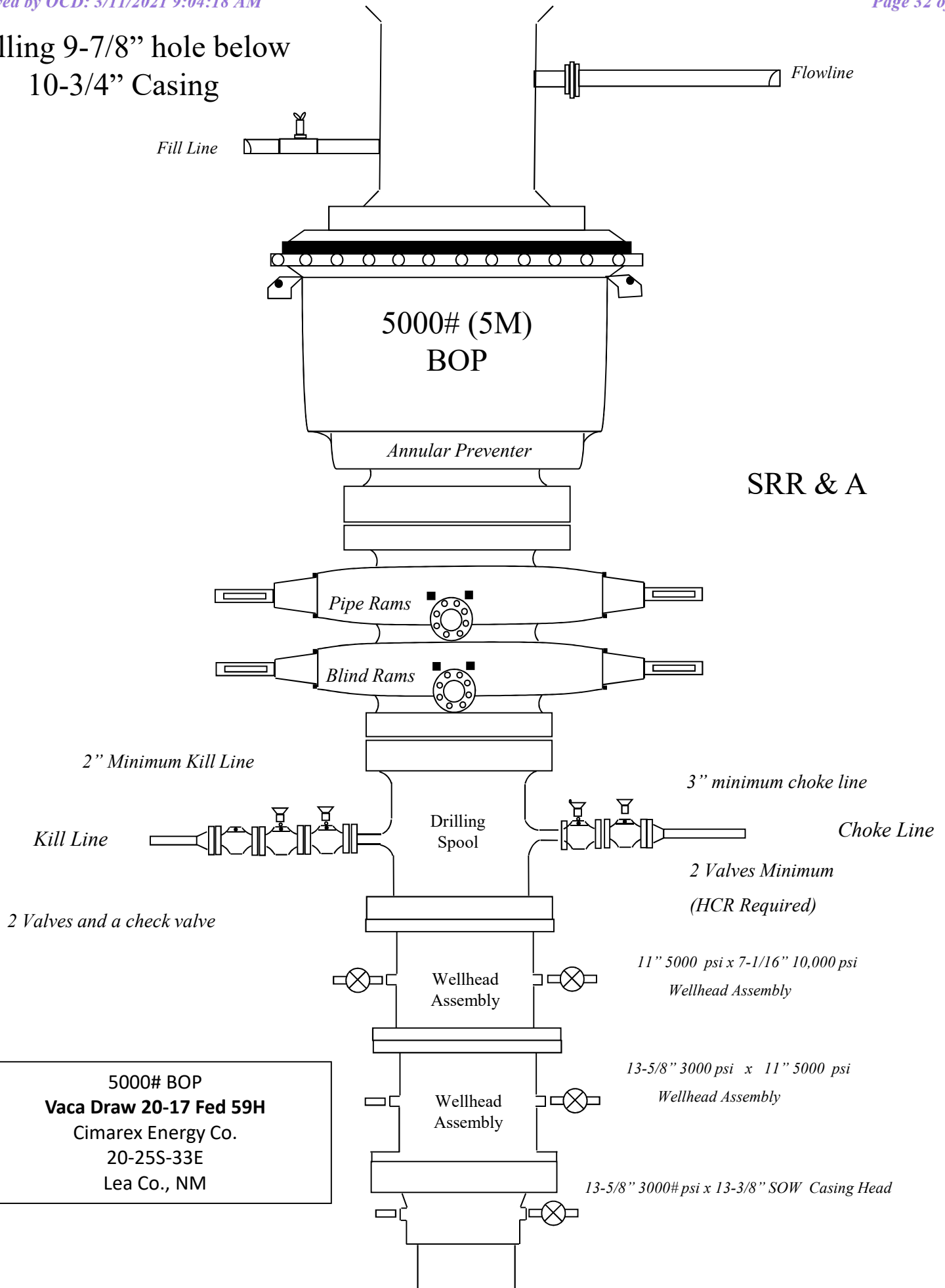
I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

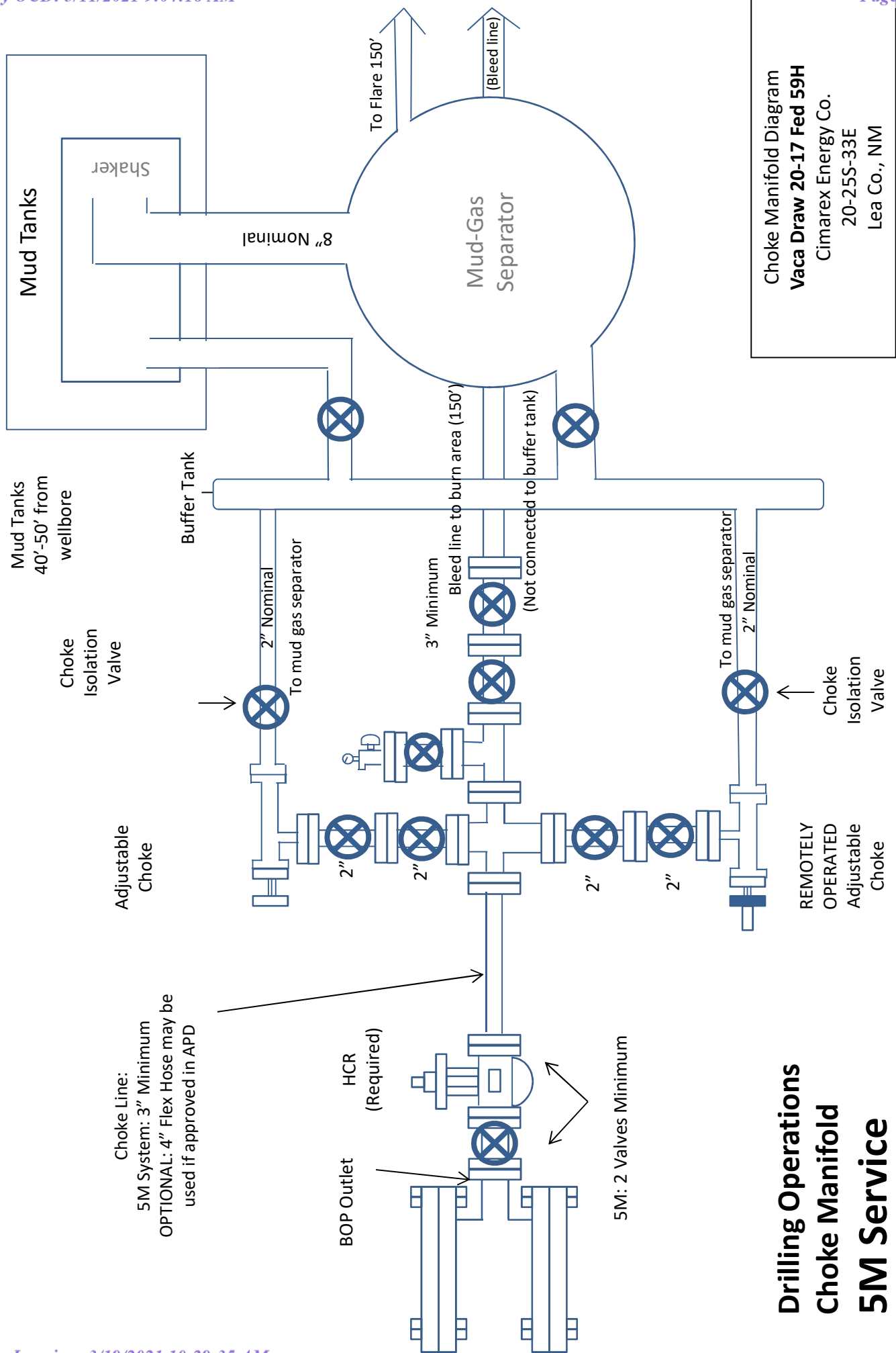
July 27, 2018

Date of Survey
Signature and Seal of Professional Surveyor:

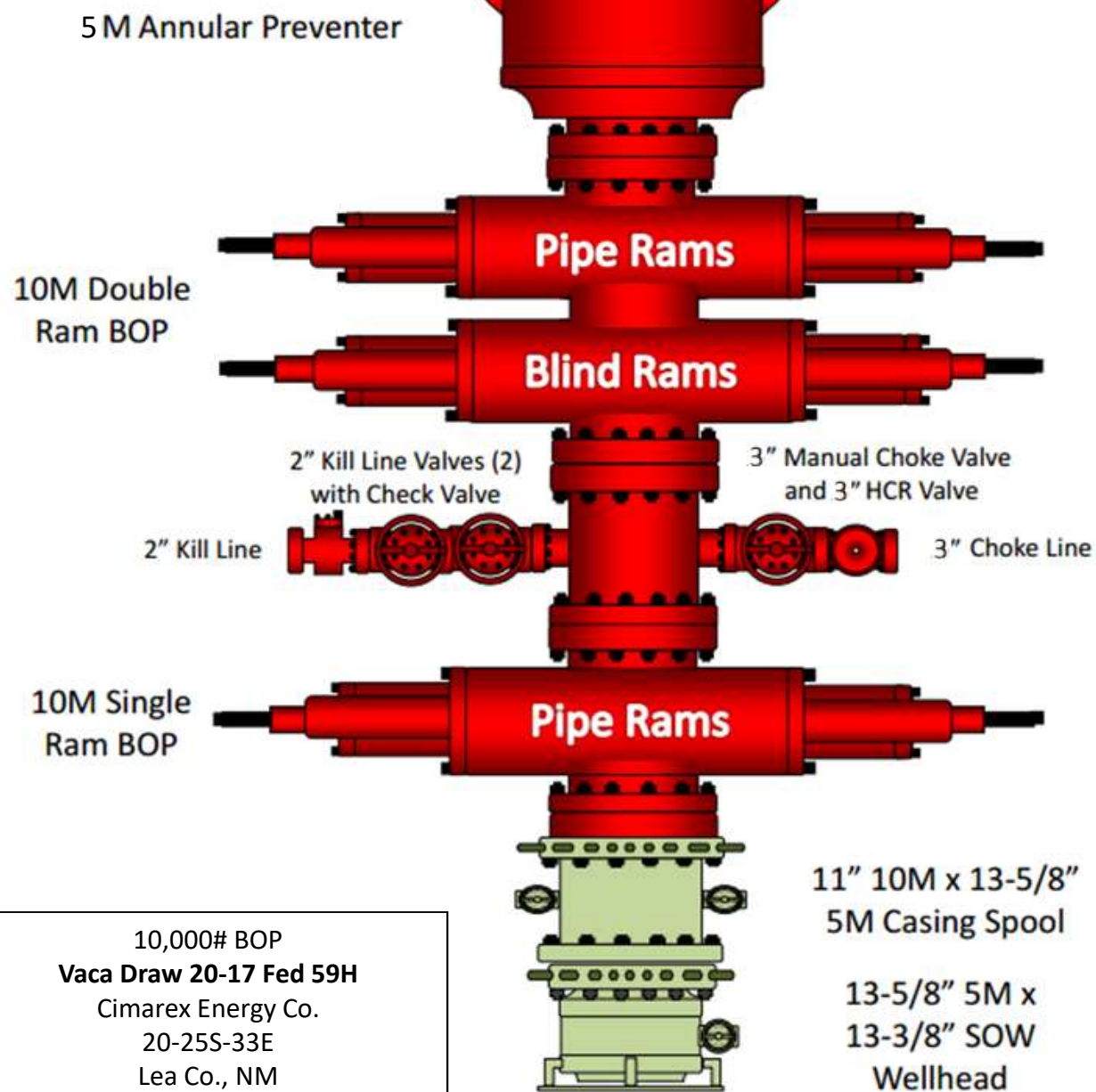
Certificate Number:

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





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



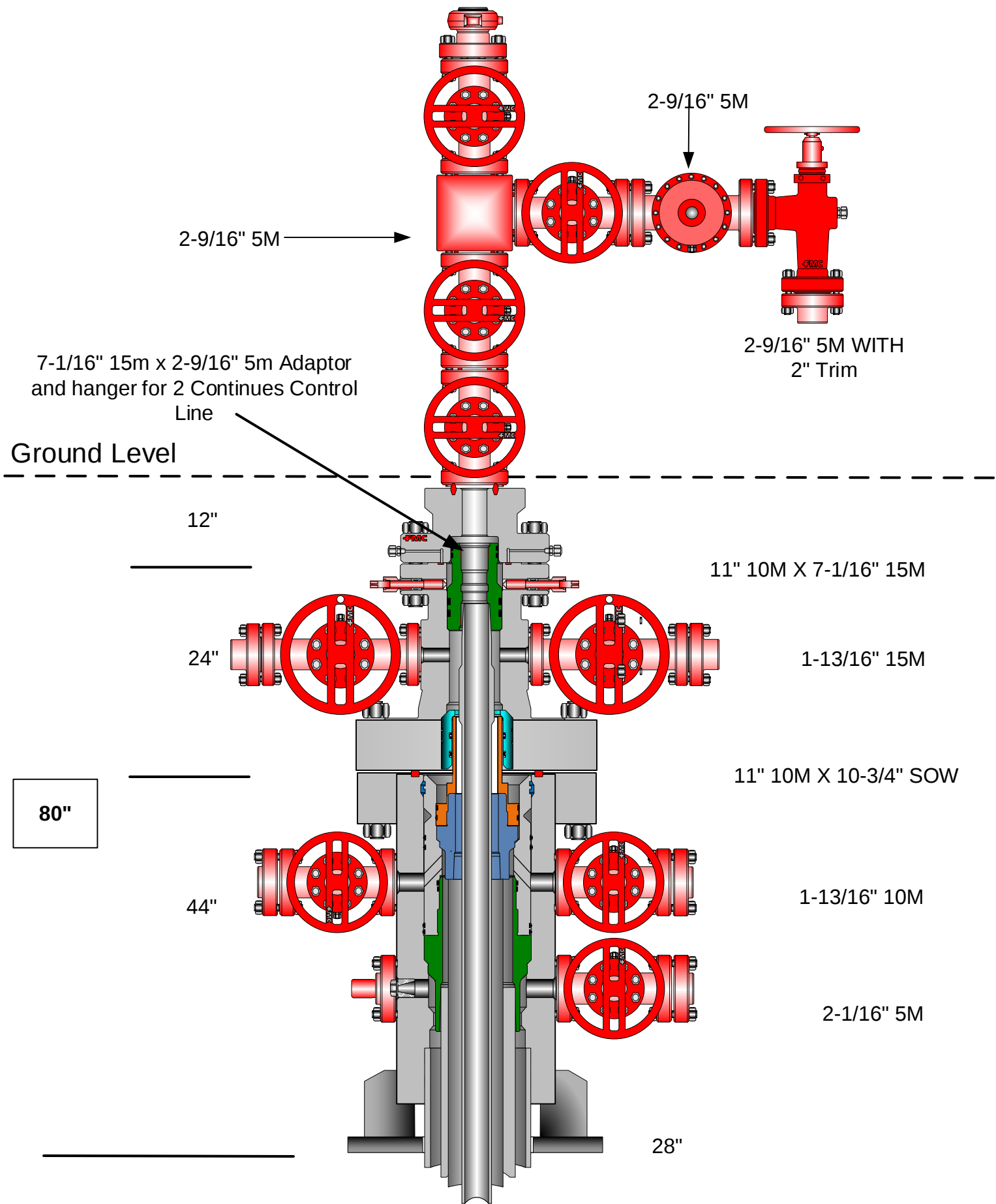




CACTUS FOR SERVICE
WEARBUSHING
IN CASING HEAD &
CASING SPOOL

LEA CO., NM

Multi-bowl Wellhead Diagram



Vaca Draw 20-17 Fed 59H
Cimarex Energy Co.
20-25S-33E
Lea Co., NM

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

Schlumberger**Cimarex Vaca Draw 20-17 Federal #59H Rev1 RM 09Feb21 Proposal****Geodetic Report**

(Def Plan)



Report Date: February 09, 2021 - 12:09 PM
Client: Cimarex Energy
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Vaca Draw 20-17 Federal #59H / New Slot
Well: Vaca Draw 20-17 Federal #59H
Borehole: Vaca Draw 20-17 Federal #59H
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Vaca Draw 20-17 Federal #59H Rev1 RM 09Feb21
Survey Date: September 24, 2018
Tort / AHD / DDI / ERD Ratio: 106.000 ° / 10780.864 ft / 6.314 / 0.861
Coordinate Reference System: NAD83 New Mexico State Plane, Eastern Zone, US Feet
Location Lat / Long: N 32° 6' 35.63073" W 103° 35' 18.99834"
Location Grid N/E Y/X: N 404513.620 ftUS, E 771919.710 ftUS
CRS Grid Convergence Angle: 0.3959 °
Grid Scale Factor: 0.99996999
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: 3421.600 ft above MSL
Seabed / Ground Elevation: 3398.600 ft above MSL
Magnetic Declination: 6.454 °
Total Gravity Field Strength: 998.4330mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47599.223 nT
Magnetic Dip Angle: 59.677 °
Declination Date: February 09, 2021
Magnetic Declination Model: HDGM 2020
North Reference: Grid North
Grid Convergence Used: 0.3959 °
Total Corr Mag North->Grid North: 6.0577 °

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, 880' FEL] Nudge 2' / 100'	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
Hold Nudge	2500.00	0.00	106.72	2500.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
Drop to Vertical	2900.00	8.00	106.72	2898.70	-8.19	-8.02	26.70	2.00	404505.60	771946.41	N 32 6 35.55	W 103 35 18.69
2°/100' DLS	6444.82	8.00	106.72	6409.03	-153.17	-149.98	499.18	0.00	404363.65	772418.87	N 32 6 34.11	W 103 35 13.21
Hold Vertical	6844.82	0.00	106.72	6807.73	-161.37	-158.00	525.88	2.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90
KOP - Build	12047.09	0.00	106.72	12010.00	-161.37	-158.00	525.88	0.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90
12°/100' DLS	12672.09	75.00	359.63	12471.19	192.52	195.88	523.62	12.00	404709.49	772443.31	N 32 6 37.53	W 103 35 12.90
Build 4°/100'	13047.09	90.00	359.63	12520.00	563.25	566.60	521.25	4.00	405080.21	772440.94	N 32 6 41.20	W 103 35 12.89
Landing Point												
Cimarex Vaca												
Draw 20-17												
Federal #59H -												
PBHL [100' FNL, 355' FEL]	22554.23	90.00	359.63	12520.00	10070.40	10073.55	460.46	0.00	414586.85	772380.16	N 32 8 15.28	W 103 35 12.83

Survey Type: Def Plan

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

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	30.000	30.000		NAL_MWD_IFR1+MS-Depth Only	Vaca Draw 20-17 Federal #59H / Cimarex Vaca Draw 20-17 Federal #59H Rev1 RM 09Feb21		
	1	23.000	22554.234		1/100.000	30.000	30.000		NAL_MWD_IFR1+MS	Vaca Draw 20-17 Federal #59H / Cimarex Vaca Draw 20-17		

Schlumberger

Cimarex Vaca Draw 20-17 Federal #59H Rev1 RM 09Feb21 Proposal Geodetic Report



(Def Plan)

Report Date: February 09, 2021 - 12:52 PM
Client: Cimarex Energy
Field: NM Lea County (NAD 83)
Structure / Slot: Cimarex Vaca Draw 20-17 Federal #59H / New Slot
Well: Vaca Draw 20-17 Federal #59H
Borehole: Vaca Draw 20-17 Federal #59H
UWI / API#: Unknown / Unknown
Survey Name: Cimarex Vaca Draw 20-17 Federal #59H Rev1 RM 09Feb21
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CRS Grid Convergence Angle: 0.3959 °
Grid Scale Factor: 0.99996999
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: 3421.600 ft above MSL
Seabed / Ground Elevation: 3398.600 ft above MSL
Magnetic Declination: 6.454 °
Total Gravity Field Strength: 998.4330mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 47599.223 nT
Magnetic Dip Angle: 59.677 °
Declination Date: February 09, 2021
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North Reference: Grid North
Grid Convergence Used: 0.3959 °
Total Corr Mag North->Grid North: 6.0577 °

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, 880° FEL]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	N/A	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	100.00	0.00	106.72	100.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	200.00	0.00	106.72	200.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	300.00	0.00	106.72	300.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	400.00	0.00	106.72	400.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	500.00	0.00	106.72	500.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	600.00	0.00	106.72	600.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	700.00	0.00	106.72	700.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	800.00	0.00	106.72	800.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	900.00	0.00	106.72	900.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	1000.00	0.00	106.72	1000.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	1100.00	0.00	106.72	1100.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	1200.00	0.00	106.72	1200.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	1300.00	0.00	106.72	1300.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	1400.00	0.00	106.72	1400.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	1500.00	0.00	106.72	1500.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	1600.00	0.00	106.72	1600.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	1700.00	0.00	106.72	1700.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	1800.00	0.00	106.72	1800.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	1900.00	0.00	106.72	1900.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	2000.00	0.00	106.72	2000.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	2100.00	0.00	106.72	2100.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	2200.00	0.00	106.72	2200.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	2300.00	0.00	106.72	2300.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	2400.00	0.00	106.72	2400.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00

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	106.72	2500.00	0.00	0.00	0.00	0.00	404513.62	771919.71	N 32 6 35.63	W 103 35 19.00
	2600.00	2.00	106.72	2599.98	-0.51	-0.50	1.67	2.00	404513.12	771921.38	N 32 6 35.63	W 103 35 18.98
Hold Nudge	2700.00	4.00	106.72	2699.84	-2.05	-2.01	6.68	2.00	404511.61	771926.39	N 32 6 35.61	W 103 35 18.92
	2800.00	6.00	106.72	2799.45	-4.61	-4.52	15.03	2.00	404509.10	771934.74	N 32 6 35.59	W 103 35 18.82
	2900.00	8.00	106.72	2898.70	-8.19	-8.02	26.70	2.00	404505.60	771946.41	N 32 6 35.55	W 103 35 18.69
	3000.00	8.00	106.72	2997.73	-12.28	-12.03	40.03	0.00	404501.59	771959.74	N 32 6 35.51	W 103 35 18.53
	3100.00	8.00	106.72	3096.76	-16.37	-16.03	53.36	0.00	404497.59	771973.07	N 32 6 35.47	W 103 35 18.38
	3200.00	8.00	106.72	3195.78	-20.46	-20.04	66.69	0.00	404493.58	771986.39	N 32 6 35.43	W 103 35 18.22
	3300.00	8.00	106.72	3294.81	-24.55	-24.04	80.02	0.00	404489.58	771999.72	N 32 6 35.39	W 103 35 18.07
	3400.00	8.00	106.72	3393.84	-28.64	-28.05	93.34	0.00	404485.58	772013.05	N 32 6 35.35	W 103 35 17.92
	3500.00	8.00	106.72	3492.86	-32.73	-32.05	106.67	0.00	404481.57	772026.38	N 32 6 35.31	W 103 35 17.76
	3600.00	8.00	106.72	3591.89	-36.82	-36.05	120.00	0.00	404477.57	772039.71	N 32 6 35.27	W 103 35 17.61
	3700.00	8.00	106.72	3690.92	-40.91	-40.06	133.33	0.00	404473.56	772053.04	N 32 6 35.23	W 103 35 17.45
	3800.00	8.00	106.72	3789.94	-45.00	-44.06	146.66	0.00	404469.56	772066.36	N 32 6 35.18	W 103 35 17.30
	3900.00	8.00	106.72	3888.97	-49.09	-48.07	159.99	0.00	404465.55	772079.69	N 32 6 35.14	W 103 35 17.14
	4000.00	8.00	106.72	3988.00	-53.18	-52.07	173.32	0.00	404461.55	772093.02	N 32 6 35.10	W 103 35 16.99
	4100.00	8.00	106.72	4087.02	-57.27	-56.08	186.65	0.00	404457.54	772106.35	N 32 6 35.06	W 103 35 16.83
Drop to Vertical 2°/100' DLS	4200.00	8.00	106.72	4186.05	-61.36	-60.08	199.97	0.00	404453.54	772119.68	N 32 6 35.02	W 103 35 16.68
	4300.00	8.00	106.72	4285.08	-65.45	-64.09	213.30	0.00	404449.54	772133.01	N 32 6 34.98	W 103 35 16.52
	4400.00	8.00	106.72	4384.10	-69.54	-68.09	226.63	0.00	404445.53	772146.33	N 32 6 34.94	W 103 35 16.37
	4500.00	8.00	106.72	4483.13	-73.63	-72.10	239.96	0.00	404441.53	772159.66	N 32 6 34.90	W 103 35 16.21
	4600.00	8.00	106.72	4582.16	-77.72	-76.10	253.29	0.00	404437.52	772172.99	N 32 6 34.86	W 103 35 16.06
	4700.00	8.00	106.72	4681.18	-81.81	-80.10	266.62	0.00	404433.52	772186.32	N 32 6 34.82	W 103 35 15.91
	4800.00	8.00	106.72	4780.21	-85.90	-84.11	279.95	0.00	404429.51	772199.65	N 32 6 34.78	W 103 35 15.75
	4900.00	8.00	106.72	4879.24	-89.99	-88.11	293.27	0.00	404425.51	772212.98	N 32 6 34.74	W 103 35 15.60
	5100.00	8.00	106.72	5077.29	-98.17	-96.12	319.93	0.00	404421.50	772226.30	N 32 6 34.70	W 103 35 15.44
	5200.00	8.00	106.72	5176.32	-102.26	-100.13	333.26	0.00	404417.50	772239.63	N 32 6 34.66	W 103 35 15.29
	5300.00	8.00	106.72	5275.35	-106.35	-104.13	346.59	0.00	404413.50	772252.96	N 32 6 34.62	W 103 35 15.13
	5400.00	8.00	106.72	5374.37	-110.44	-108.14	359.92	0.00	404409.49	772266.29	N 32 6 34.58	W 103 35 14.98
	5500.00	8.00	106.72	5473.40	-114.53	-112.14	373.25	0.00	404405.49	772279.62	N 32 6 34.54	W 103 35 14.82
	5600.00	8.00	106.72	5572.43	-118.62	-116.15	386.58	0.00	404397.48	772306.27	N 32 6 34.46	W 103 35 14.51
	5700.00	8.00	106.72	5671.45	-122.71	-120.15	399.90	0.00	404393.47	772319.60	N 32 6 34.41	W 103 35 14.36
	5800.00	8.00	106.72	5770.48	-126.80	-124.16	413.23	0.00	404389.47	772332.93	N 32 6 34.37	W 103 35 14.20
	5900.00	8.00	106.72	5869.51	-130.89	-128.16	426.56	0.00	404385.46	772346.26	N 32 6 34.33	W 103 35 14.05
	6000.00	8.00	106.72	5968.53	-134.98	-132.16	439.89	0.00	404381.46	772359.59	N 32 6 34.29	W 103 35 13.89
	6100.00	8.00	106.72	6067.56	-139.07	-136.17	453.22	0.00	404377.46	772372.91	N 32 6 34.25	W 103 35 13.74
	6200.00	8.00	106.72	6166.59	-143.16	-140.17	466.55	0.00	404373.45	772386.24	N 32 6 34.21	W 103 35 13.59
	6300.00	8.00	106.72	6265.61	-147.25	-144.18	479.88	0.00	404369.45	772399.57	N 32 6 34.17	W 103 35 13.43
	6400.00	8.00	106.72	6364.64	-151.34	-148.18	493.21	0.00	404365.44	772412.90	N 32 6 34.13	W 103 35 13.28
	6444.82	8.00	106.72	6409.03	-153.17	-149.98	499.18	0.00	404363.65	772418.87	N 32 6 34.11	W 103 35 13.21
	6500.00	6.90	106.72	6463.74	-155.27	-152.04	506.03	2.00	404361.59	772425.72	N 32 6 34.09	W 103 35 13.13
	6600.00	4.90	106.72	6563.20	-158.29	-154.99	515.87	2.00	404358.63	772435.56	N 32 6 34.06	W 103 35 13.01
	6700.00	2.90	106.72	6662.97	-160.29	-156.95	522.38	2.00	404356.68	772442.07	N 32 6 34.04	W 103 35 12.94
	6800.00	0.90	106.72	6762.91	-161.26	-157.90	525.54	2.00	404355.73	772445.24	N 32 6 34.03	W 103 35 12.90
Hold Vertical	6844.82	0.00	106.72	6807.73	-161.37	-158.00	525.88	2.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90
	6900.00	0.00	106.72	6862.91	-161.37	-158.00	525.88	0.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90
	7000.00	0.00	106.72	6962.91	-161.37	-158.00	525.88	0.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90
	7100.00	0.00	106.72	7062.91	-161.37	-158.00	525.88	0.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90
	7200.00	0.00	106.72	7162.91	-161.37	-158.00	525.88	0.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90
	7300.00	0.00	106.72	7262.91	-161.37	-158.00	525.88	0.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90
	7400.00	0.00	106.72	7362.91	-161.37	-158.00	525.88	0.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90
	7500.00	0.00	106.72	7462.91	-161.37	-158.00	525.88	0.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90
	7600.00	0.00	106.72	7562.91	-161.37	-158.00	525.88	0.00	404355.63	772445.57	N 32 6 34.03	W 103 35 12.90

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 ° ' ")
	12700.00	76.12	359.63	12478.15	219.55	222.91	523.44	4.00	404736.52	772443.14	N 32° 6' 37.80"	W 103° 35' 12.89"
	12800.00	80.12	359.63	12498.74	317.39	320.74	522.82	4.00	404834.35	772442.51	N 32° 6' 38.77"	W 103° 35' 12.89"
	12900.00	84.12	359.63	12512.45	416.42	419.77	522.19	4.00	404933.38	772441.88	N 32° 6' 39.75"	W 103° 35' 12.89"
	13000.00	88.12	359.63	12519.23	516.17	519.52	521.55	4.00	405033.13	772441.24	N 32° 6' 40.74"	W 103° 35' 12.89"
	13047.09	90.00	359.63	12520.00	563.25	566.60	521.25	4.00	405080.21	772440.94	N 32° 6' 41.20"	W 103° 35' 12.89"
	13100.00	90.00	359.63	12520.00	616.16	619.51	520.91	0.00	405133.11	772440.60	N 32° 6' 41.73"	W 103° 35' 12.89"
	13200.00	90.00	359.63	12520.00	716.16	719.51	520.27	0.00	405233.11	772439.96	N 32° 6' 42.71"	W 103° 35' 12.89"
	13300.00	90.00	359.63	12520.00	816.16	819.51	519.63	0.00	405333.10	772439.32	N 32° 6' 43.70"	W 103° 35' 12.89"
	13400.00	90.00	359.63	12520.00	916.16	919.51	518.99	0.00	405433.10	772438.68	N 32° 6' 44.69"	W 103° 35' 12.89"
	13500.00	90.00	359.63	12520.00	1016.16	1019.50	518.35	0.00	405533.09	772438.05	N 32° 6' 45.68"	W 103° 35' 12.89"
	13600.00	90.00	359.63	12520.00	1116.16	1119.50	517.71	0.00	405633.09	772437.41	N 32° 6' 46.67"	W 103° 35' 12.89"
	13700.00	90.00	359.63	12520.00	1216.16	1219.50	517.07	0.00	405733.08	772436.77	N 32° 6' 47.66"	W 103° 35' 12.89"
	13800.00	90.00	359.63	12520.00	1316.16	1319.50	516.43	0.00	405833.07	772436.13	N 32° 6' 48.65"	W 103° 35' 12.89"
	13900.00	90.00	359.63	12520.00	1416.16	1419.50	515.79	0.00	405933.07	772435.49	N 32° 6' 49.64"	W 103° 35' 12.89"
	14000.00	90.00	359.63	12520.00	1516.16	1519.49	515.16	0.00	406033.06	772434.85	N 32° 6' 50.63"	W 103° 35' 12.89"
	14100.00	90.00	359.63	12520.00	1616.16	1619.49	514.52	0.00	406133.06	772434.21	N 32° 6' 51.62"	W 103° 35' 12.89"
	14200.00	90.00	359.63	12520.00	1716.16	1719.49	513.88	0.00	406233.05	772433.57	N 32° 6' 52.61"	W 103° 35' 12.89"
	14300.00	90.00	359.63	12520.00	1816.16	1819.49	513.24	0.00	406333.05	772432.93	N 32° 6' 53.60"	W 103° 35' 12.89"
	14400.00	90.00	359.63	12520.00	1916.16	1919.48	512.60	0.00	406433.04	772432.29	N 32° 6' 54.59"	W 103° 35' 12.88"
	14500.00	90.00	359.63	12520.00	2016.16	2019.48	511.96	0.00	406533.04	772431.65	N 32° 6' 55.58"	W 103° 35' 12.88"
	14600.00	90.00	359.63	12520.00	2116.16	2119.48	511.32	0.00	406633.03	772431.01	N 32° 6' 56.57"	W 103° 35' 12.88"
	14700.00	90.00	359.63	12520.00	2216.16	2219.48	510.68	0.00	406733.03	772430.37	N 32° 6' 57.56"	W 103° 35' 12.88"
	14800.00	90.00	359.63	12520.00	2316.16	2319.48	510.04	0.00	406833.02	772429.73	N 32° 6' 58.55"	W 103° 35' 12.88"
	14900.00	90.00	359.63	12520.00	2416.16	2419.47	509.40	0.00	406933.02	772429.09	N 32° 6' 59.54"	W 103° 35' 12.88"
	15000.00	90.00	359.63	12520.00	2516.16	2519.47	508.76	0.00	407033.01	772428.46	N 32° 7' 0' 53"	W 103° 35' 12.88"
	15100.00	90.00	359.63	12520.00	2616.16	2619.47	508.12	0.00	407133.01	772427.82	N 32° 7' 1' 52"	W 103° 35' 12.88"
	15200.00	90.00	359.63	12520.00	2716.16	2719.47	507.48	0.00	407233.00	772427.18	N 32° 7' 2' 51"	W 103° 35' 12.88"
	15300.00	90.00	359.63	12520.00	2816.16	2819.47	506.84	0.00	407333.00	772426.54	N 32° 7' 3' 49"	W 103° 35' 12.88"
	15400.00	90.00	359.63	12520.00	2916.16	2919.46	506.20	0.00	407432.99	772425.90	N 32° 7' 4' 48"	W 103° 35' 12.88"
	15500.00	90.00	359.63	12520.00	3016.16	3019.46	505.57	0.00	407532.99	772425.26	N 32° 7' 5' 47"	W 103° 35' 12.88"
	15600.00	90.00	359.63	12520.00	3116.16	3119.46	504.93	0.00	407632.98	772424.62	N 32° 7' 6' 46"	W 103° 35' 12.88"
	15700.00	90.00	359.63	12520.00	3216.16	3219.46	504.29	0.00	407732.98	772423.98	N 32° 7' 7' 45"	W 103° 35' 12.88"
	15800.00	90.00	359.63	12520.00	3316.16	3319.46	503.65	0.00	407832.97	772423.34	N 32° 7' 8' 44"	W 103° 35' 12.88"
	15900.00	90.00	359.63	12520.00	3416.16	3419.45	503.01	0.00	407932.96	772422.70	N 32° 7' 9' 43"	W 103° 35' 12.88"
	16000.00	90.00	359.63	12520.00	3516.16	3519.45	502.37	0.00	408032.96	772422.06	N 32° 7' 10' 42"	W 103° 35' 12.87"
	16100.00	90.00	359.63	12520.00	3616.16	3619.45	501.73	0.00	408132.95	772421.42	N 32° 7' 11' 41"	W 103° 35' 12.87"
	16200.00	90.00	359.63	12520.00	3716.16	3719.45	501.09	0.00	408232.95	772420.78	N 32° 7' 12' 40"	W 103° 35' 12.87"
	16300.00	90.00	359.63	12520.00	3816.16	3819.45	500.45	0.00	408332.94	772420.14	N 32° 7' 13' 39"	W 103° 35' 12.87"
	16400.00	90.00	359.63	12520.00	3916.16	3919.44	499.81	0.00	408432.94	772419.51	N 32° 7' 14' 38"	W 103° 35' 12.87"
	16500.00	90.00	359.63	12520.00	4016.16	4019.44	499.17	0.00	408532.93	772418.87	N 32° 7' 15' 37"	W 103° 35' 12.87"
	16600.00	90.00	359.63	12520.00	4116.16	4119.44	498.53	0.00	408632.93	772418.23	N 32° 7' 16' 36"	W 103° 35' 12.87"
	16700.00	90.00	359.63	12520.00	4216.16	4219.44	497.89	0.00	408732.92	772417.59	N 32° 7' 17' 35"	W 103° 35' 12.87"
	16800.00	90.00	359.63	12520.00	4316.16	4319.44	497.25	0.00	408832.92	772416.95	N 32° 7' 18' 34"	W 103° 35' 12.87"
	16900.00	90.00	359.63	12520.00	4416.16	4419.43	496.61	0.00	408932.91	772416.31	N 32° 7' 19' 33"	W 103° 35' 12.87"
	17000.00	90.00	359.63	12520.00	4516.16	4519.43	495.97	0.00	409032.91	772415.67	N 32° 7' 20' 32"	W 103° 35' 12.87"
	17100.00	90.00	359.63	12520.00	4616.16	4619.43	495.34	0.00	409132.90	772415.03	N 32° 7' 21' 31"	W 103° 35' 12.87"
	17200.00	90.00	359.63	12520.00	4716.16	4719.43	494.70	0.00	409232.90	772414.39	N 32° 7' 22' 30"	W 103° 35' 12.87"
	17300.00	90.00	359.63	12520.00	4816.16	4819.43	494.06	0.00	409332.89	772413.75	N 32° 7' 23' 29"	W 103° 35' 12.87"
	17400.00	90.00	359.63	12520.00	4916.16	4919.42	493.42	0.00	409432.89	772413.11	N 32° 7' 24' 28"	W 103° 35' 12.87"
	17500.00	90.00	359.63	12520.00	5016.16	5019.42	492.78	0.00	409532.88	772412.47	N 32° 7' 25' 26"	W 103° 35' 12.87"
	17600.00	90.00	359.63	12520.00	5116.16	5119.42	492.14	0.00	409632.88	772411.83	N 32° 7' 26' 25"	W 103° 35' 12.86"
	17700.00	90.00	359.63	12520.00	5216.16	5219.42	491.50	0.00	409732.87	772411.19	N 32° 7' 27' 24"	W 103° 35' 12.86"
	17800.00	90.00	359.63	12520.00	5316.16	5319.42	490.86	0.00	409832.87	772410.55	N 32° 7' 28' 23"	W 103° 35' 12.86"

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 ° ' ")
	17900.00	90.00	359.63	12520.00	5416.16	5419.41	490.22	0.00	409932.86	772409.92	N 32 7 29.22	W 103 35 12.86
	18000.00	90.00	359.63	12520.00	5516.16	5519.41	489.58	0.00	410032.85	772409.28	N 32 7 30.21	W 103 35 12.86
	18100.00	90.00	359.63	12520.00	5616.16	5619.41	488.94	0.00	410132.85	772408.64	N 32 7 31.20	W 103 35 12.86
	18200.00	90.00	359.63	12520.00	5716.16	5719.41	488.30	0.00	410232.84	772408.00	N 32 7 32.19	W 103 35 12.86
	18300.00	90.00	359.63	12520.00	5816.16	5819.41	487.66	0.00	410332.84	772407.36	N 32 7 33.18	W 103 35 12.86
	18400.00	90.00	359.63	12520.00	5916.16	5919.40	487.02	0.00	410432.83	772406.72	N 32 7 34.17	W 103 35 12.86
	18500.00	90.00	359.63	12520.00	6016.16	6019.40	486.38	0.00	410532.83	772406.08	N 32 7 35.16	W 103 35 12.86
	18600.00	90.00	359.63	12520.00	6116.16	6119.40	485.75	0.00	410632.82	772405.44	N 32 7 36.15	W 103 35 12.86
	18700.00	90.00	359.63	12520.00	6216.16	6219.40	485.11	0.00	410732.82	772404.80	N 32 7 37.14	W 103 35 12.86
	18800.00	90.00	359.63	12520.00	6316.16	6319.40	484.47	0.00	410832.81	772404.16	N 32 7 38.13	W 103 35 12.86
	18900.00	90.00	359.63	12520.00	6416.16	6419.39	483.83	0.00	410932.81	772403.52	N 32 7 39.12	W 103 35 12.86
	19000.00	90.00	359.63	12520.00	6516.16	6519.39	483.19	0.00	411032.80	772402.88	N 32 7 40.11	W 103 35 12.86
	19100.00	90.00	359.63	12520.00	6616.16	6619.38	482.55	0.00	411132.80	772402.24	N 32 7 41.10	W 103 35 12.86
	19200.00	90.00	359.63	12520.00	6716.16	6719.39	481.91	0.00	411232.79	772401.60	N 32 7 42.09	W 103 35 12.85
	19300.00	90.00	359.63	12520.00	6816.16	6819.38	481.27	0.00	411332.79	772400.96	N 32 7 43.08	W 103 35 12.85
	19400.00	90.00	359.63	12520.00	6916.16	6919.38	480.63	0.00	411432.78	772400.33	N 32 7 44.07	W 103 35 12.85
	19500.00	90.00	359.63	12520.00	7016.16	7019.38	479.99	0.00	411532.78	772399.69	N 32 7 45.06	W 103 35 12.85
	19600.00	90.00	359.63	12520.00	7116.16	7119.38	479.35	0.00	411632.77	772399.05	N 32 7 46.04	W 103 35 12.85
	19700.00	90.00	359.63	12520.00	7216.16	7219.38	478.71	0.00	411732.77	772398.41	N 32 7 47.03	W 103 35 12.85
	19800.00	90.00	359.63	12520.00	7316.16	7319.37	478.07	0.00	411832.76	772397.77	N 32 7 48.02	W 103 35 12.85
	19900.00	90.00	359.63	12520.00	7416.16	7419.37	477.43	0.00	411932.76	772397.13	N 32 7 49.01	W 103 35 12.85
	20000.00	90.00	359.63	12520.00	7516.16	7519.37	476.79	0.00	412032.75	772396.49	N 32 7 50.00	W 103 35 12.85
	20100.00	90.00	359.63	12520.00	7616.16	7619.37	476.16	0.00	412132.74	772395.85	N 32 7 50.99	W 103 35 12.85
	20200.00	90.00	359.63	12520.00	7716.16	7719.37	475.52	0.00	412232.74	772395.21	N 32 7 51.98	W 103 35 12.85
	20300.00	90.00	359.63	12520.00	7816.16	7819.36	474.88	0.00	412332.73	772394.57	N 32 7 52.97	W 103 35 12.85
	20400.00	90.00	359.63	12520.00	7916.16	7919.36	474.24	0.00	412432.73	772393.93	N 32 7 53.96	W 103 35 12.85
	20500.00	90.00	359.63	12520.00	8016.16	8019.36	473.60	0.00	412532.72	772393.29	N 32 7 54.95	W 103 35 12.85
	20600.00	90.00	359.63	12520.00	8116.16	8119.36	472.96	0.00	412632.72	772392.65	N 32 7 55.94	W 103 35 12.85
	20700.00	90.00	359.63	12520.00	8216.16	8219.36	472.32	0.00	412732.71	772392.01	N 32 7 56.93	W 103 35 12.85
	20800.00	90.00	359.63	12520.00	8316.16	8319.35	471.68	0.00	412832.71	772391.38	N 32 7 57.92	W 103 35 12.84
	20900.00	90.00	359.63	12520.00	8416.16	8419.35	471.04	0.00	412932.70	772390.74	N 32 7 58.91	W 103 35 12.84
	21000.00	90.00	359.63	12520.00	8516.16	8519.35	470.40	0.00	413032.70	772390.10	N 32 7 59.90	W 103 35 12.84
	21100.00	90.00	359.63	12520.00	8616.16	8619.35	469.76	0.00	413132.69	772389.46	N 32 8 0.89	W 103 35 12.84
	21200.00	90.00	359.63	12520.00	8716.16	8719.35	469.12	0.00	413232.69	772388.82	N 32 8 1.88	W 103 35 12.84
	21300.00	90.00	359.63	12520.00	8816.16	8819.34	468.48	0.00	413332.68	772388.18	N 32 8 2.87	W 103 35 12.84
	21400.00	90.00	359.63	12520.00	8916.16	8919.34	467.84	0.00	413432.68	772387.54	N 32 8 3.86	W 103 35 12.84
	21500.00	90.00	359.63	12520.00	9016.16	9019.34	467.20	0.00	413532.67	772386.90	N 32 8 4.85	W 103 35 12.84
	21600.00	90.00	359.63	12520.00	9116.16	9119.34	466.57	0.00	413632.67	772386.26	N 32 8 5.84	W 103 35 12.84
	21700.00	90.00	359.63	12520.00	9216.16	9219.34	465.93	0.00	413732.66	772385.62	N 32 8 6.82	W 103 35 12.84
	21800.00	90.00	359.63	12520.00	9316.16	9319.33	465.29	0.00	413832.66	772384.98	N 32 8 7.81	W 103 35 12.84
	21900.00	90.00	359.63	12520.00	9416.16	9419.33	464.65	0.00	413932.65	772384.34	N 32 8 8.80	W 103 35 12.84
	22000.00	90.00	359.63	12520.00	9516.16	9519.33	464.01	0.00	414032.64	772383.70	N 32 8 9.79	W 103 35 12.84
	22100.00	90.00	359.63	12520.00	9616.16	9619.33	463.37	0.00	414132.64	772383.06	N 32 8 10.78	W 103 35 12.84
	22200.00	90.00	359.63	12520.00	9716.16	9719.33	462.73	0.00	414232.63	772382.42	N 32 8 11.77	W 103 35 12.84
	22300.00	90.00	359.63	12520.00	9816.16	9819.32	462.09	0.00	414332.63	772381.79	N 32 8 12.76	W 103 35 12.84
	22400.00	90.00	359.63	12520.00	9916.16	9919.32	461.45	0.00	414432.62	772381.15	N 32 8 13.75	W 103 35 12.83
	22500.00	90.00	359.63	12520.00	10016.16	10019.32	460.81	0.00	414532.62	772380.51	N 32 8 14.74	W 103 35 12.83
Cimarex Vaca Draw 20-17 Federal #59H - PBHL[100' FNL, 355' FEL]	22554.23	90.00	359.63	12520.00	10070.40	10073.55	460.46	0.00	414586.85	772380.16	N 32 8 15.28	W 103 35 12.83

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: ISCWSA 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	30.000	30.000	NAL_MWD_IFR1+MS-Depth Only		Vaca Draw 20-17 Federal #59H / Cimarex Vaca Draw 20-17
	1	23.000	22554.234	1/100.000	30.000	30.000	NAL_MWD_IFR1+MS		Federal #59H Rev1 RM 09Feb21 Vaca Draw 20-17 Federal #59H / Cimarex Vaca Draw 20-17

Schlumberger



Cimarex Vaca Draw 20-17 Federal #59H Rev1 RM 09Feb21 Anti-Collision Summary Report

Analysis Date-24hr Time: February 09, 2021 - 12:10

Client: Cimarex Energy

Field: NM Lea County (NAD 83)

Structure: Cimarex Vaca Draw 20-17 Federal #59H

Slot: New Slot

Well: Vaca Draw 20-17 Federal #59H

Borehole: Vaca Draw 20-17 Federal #59H

Scan MD Range: 0.00ft ~ 22554.23ft

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 #59H 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 #58H Rev1 RM
09Feb21 (Def Plan)

20.00	16.36	18.19	3.64	N/A	MAS = 4.99 (m)	0.00	0.00	CtCt<= 15m<15.00		Enter Alert	Fall Minor
20.00	16.36	18.19	3.64	40942.91	MAS = 4.99 (m)	23.00	23.00			WRP	
20.00	20.08	6.01	-0.08	1.49	OSF1.50	2000.00	2000.00	OSF<1.50		Enter Minor	
20.00	24.79	2.87	-4.79	1.19	OSF1.50	2500.00	2500.00			MinPt-CtCt	
20.02	24.86	2.84	-4.84	1.18	OSF1.50	2510.00	2510.00			MINPT-O-EOU	
20.07	24.92	2.85	-4.86	1.18	OSF1.50	2520.00	2520.00			MinPis	
25.46	25.73	7.70	-0.27	1.48	OSF1.50	2680.00	2679.88	OSF>1.50		Exit Minor	
47.37	26.65	28.99	20.71	2.75	OSF1.50	2900.00	2898.70			MinPis	
85.47	26.95	66.90	58.52	4.99	OSF1.50	3160.00	3156.17	OSF>5.00		Exit Alert	
658.27	38.22	632.19	620.05	27.04	OSF1.50	6444.82	6409.03			MinPt-O-SF	
685.09	78.81	631.95	606.28	13.31	OSF1.50	11970.00	11932.91			MINPT-O-EOU	
685.15	78.89	631.96	606.26	13.30	OSF1.50	11980.00	11942.91			MinPt-O-ADP	
689.65	80.02	635.70	609.63	13.19	OSF1.50	12160.00	12121.86			MinPt-O-SF	
712.17	83.95	655.60	628.22	12.97	OSF1.50	13050.00	12520.00			MinPt-CtCt	
712.17	215.18	568.12	497.00	4.99	OSF1.50	18270.00	12520.00	OSF<5.00		Enter Alert	
712.18	347.96	479.60	364.22	3.08	OSF1.50	22554.23	12520.00			MinPis	

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

40.05	32.40	38.24	7.65	N/A	MAS = 9.88 (m)	0.00	0.00	CtCt<= 15m<15.00		Enter Alert	Warning Alert
40.05	32.40	38.24	7.65	N/A	MAS = 9.88 (m)	23.00	23.00			WRP	

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	
	40.09	32.40	22.92	7.65	MAS = 9.88 (m)	2500.00	2500.00				MinPls
	40.09	32.40	22.93	7.68	MAS = 9.88 (m)	2510.00	2510.00				MinPlt-O-SF
	76.38	32.40	59.31	43.98	MAS = 9.88 (m)	2830.00	2829.27	OSF>5.00			Exit Alert
	93.27	32.40	76.26	60.86	MAS = 9.88 (m)	2900.00	2898.70				MinPls
	1355.05	51.12	1320.37	1303.93	OSF1.50	7950.00	7912.91				MinPlt-O-SF
	1368.81	80.76	1314.36	1288.04	OSF1.50	12980.00	12518.43				MinPlt-CtCt
	1388.81	348.70	1135.74	1020.11	OSF1.50	22554.23	12520.00				MinPls

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

	509.87	32.81	508.07	477.06	N/A	0.00	0.00				MinPls
	509.88	32.81	508.07	477.07	127812.85	23.00	23.00				WRP
	510.02	32.81	508.00	477.21	2475.57	90.00	90.00				MINPT-O-EOU
	510.22	32.81	507.98	477.41	1184.42	140.00	140.00				MINPT-O-EOU
	506.99	32.81	500.23	474.18	102.17	1060.00	1060.00				MINPT-O-EOU
	88.97	32.81	69.85	56.16	4.99	5660.00	5631.84	OSF<5.00			Enter Alert
	86.35	32.81	67.00	53.54	4.76	5730.00	5701.16				MinPls
	86.35	32.81	66.97	53.54	4.75	5740.00	5711.06				MINPT-O-EOU
	86.46	32.81	67.03	53.65	4.75	5750.00	5720.97				MinPlt-O-SF
	91.56	32.81	71.84	58.75	4.95	5840.00	5810.09	OSF>5.00			Exit Alert
	636.98	41.69	608.68	595.29	23.74	9590.00	9552.91				MinPlt-O-SF
	2576.02	35.37	2551.96	2540.65	113.82	13300.00	12520.00				MinPlt-CtCt
	2546.05	67.85	2500.34	2478.21	57.48	14650.00	12520.00				MinPlt-CtCt
	2546.74	69.93	2499.65	2476.82	55.75	14750.00	12520.00				MINPT-O-EOU
	2552.01	81.47	2497.21	2470.54	47.80	15170.00	12520.00				MINPT-O-EOU
	2536.97	144.56	2440.12	2392.41	26.57	17310.00	12520.00				MinPlt-CtCt
	2540.61	175.92	2422.84	2364.68	21.83	18370.00	12520.00				MinPlt-CtCt
	2541.31	177.89	2422.23	2363.42	21.59	18460.00	12520.00				MINPT-O-EOU
	2542.04	178.76	2422.38	2363.26	21.49	18500.00	12520.00				MinPlt-O-ADP
	2543.76	185.17	2419.84	2358.59	20.76	18680.00	12520.00				MinPlt-CtCt
	2544.00	195.02	2413.51	2348.98	19.70	19010.00	12520.00				MinPlt-CtCt
	2541.51	222.49	2392.71	2319.03	17.24	19930.00	12520.00				MinPlt-CtCt
	2548.09	249.70	2381.14	2298.39	15.39	20840.00	12520.00				MinPlt-CtCt
	2550.15	266.76	2371.83	2283.39	14.41	21410.00	12520.00				MinPlt-CtCt
	2560.09	300.34	2359.39	2259.75	12.84	22554.23	12520.00				MinPls

Warning Alert

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

	3331.22	32.81	3328.72	3298.41	N/A	0.00	0.00				Surface
	3331.21	32.81	3328.29	3298.41	7784.72	23.00	23.00				WRP
	3328.98	32.81	3309.88	3296.18	200.35	540.00	540.00				MinPls
	3333.20	129.14	3246.27	3204.05	39.45	2500.00	2500.00				MinPlt-CtCt
	3335.59	136.04	3244.06	3199.54	37.44	2650.00	2649.93				MINPT-O-EOU
	3338.76	139.89	3244.66	3198.87	36.43	2730.00	2729.75				MinPlt-O-ADP
	3349.80	148.08	3250.25	3201.73	34.49	2900.00	2898.70				MinPls
	3431.13	209.77	3280.45	3221.36	24.81	4000.00	3988.00				MinPlt-O-ADP
	3639.94	367.80	3393.90	3272.13	14.94	7150.00	7112.91				MinPlt-CtCt
	3638.60	430.19	3350.97	3208.41	12.75	8350.00	8312.91				MinPlt-CtCt
	3631.88	545.55	3267.34	3086.33	10.03	10560.00	10522.91				MinPlt-CtCt
	3637.50	562.06	3261.98	3075.44	9.74	10970.00	10932.91				MINPT-O-EOU
	2157.20	650.85	1721.78	1506.35	5.00	13990.00	12520.00	OSF<5.00			Enter Alert

Warning Alert

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	
	1301.14	654.80	863.78	646.34	2.99	OSF1.50	15710.00	12520.00			MinPls
	1301.17	654.83	863.79	646.34	2.99	OSF1.50	15720.00	12520.00			MinPl-O-SF
	2171.71	654.60	1734.48	1517.11	4.99	OSF1.50	17450.00	12520.00	OSF>5.00		Exit Alert
	6964.24	660.09	6523.35	6304.15	15.88	OSF1.50	22554.23	12520.00			TD

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

4372.49	32.81	4369.00	4339.68	4437.46	MAS = 10.00 (m)	0.00	0.00				Surface
4372.49	32.81	4366.59	4339.68	1287.41	MAS = 10.00 (m)	23.00	23.00				WRP
4372.49	775.90	3854.39	3596.59	8.48	OSF1.50	2500.00	2500.00				MinPl-CtCt
4436.96	1352.46	3594.49	3144.50	4.99	OSF1.50	4350.00	4334.59	OSF<5.00			Enter Alert
4555.43	1581.92	3499.99	2973.51	4.32	OSF1.50	5090.00	5067.39				MinPls
4964.02	1492.41	3968.25	3471.61	5.00	OSF1.50	6750.00	6712.92	OSF>5.00			Exit Alert
7628.84	350.73	7394.19	7278.11	32.85	OSF1.50	16720.00	12520.00				MinPl-CtCt
7629.09	351.21	7394.08	7277.83	32.80	OSF1.50	16780.00	12520.00				MINPT-O-EOU
7635.65	358.43	7395.86	7277.22	32.17	OSF1.50	17040.00	12520.00				MinPl-O-ADP
9605.49	1012.47	8929.67	8593.01	14.26	OSF1.50	22554.23	12520.00				MinPl-O-SF

Warning Alert

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

549.87	32.81	548.07	517.07	N/A	MAS = 10.00 (m)	0.00	0.00				Surface
549.87	32.81	548.06	517.06	494774.10	MAS = 10.00 (m)	23.00	23.00				WRP
549.60	32.81	546.71	516.79	506.33	MAS = 10.00 (m)	290.00	290.00				MinPls
548.82	32.81	543.65	516.01	162.50	MAS = 10.00 (m)	800.00	800.00				MinPls
548.99	32.81	543.46	516.18	147.26	MAS = 10.00 (m)	890.00	890.00				MINPT-O-EOU
168.56	32.81	147.08	135.75	8.48	MAS = 10.00 (m)	6650.00	6613.06				MinPl-O-SF
162.16	32.81	139.75	129.35	7.76	MAS = 10.00 (m)	7690.00	7652.91				MinPls
162.25	33.07	139.62	129.18	7.69	OSF1.50	7742.91	7742.91				MINPT-O-EOU
162.34	33.18	139.64	129.16	7.66	OSF1.50	7810.00	7772.91				MinPl-O-ADP
163.00	33.80	139.89	129.20	7.55	OSF1.50	7980.00	7942.91				MINPT-O-EOU
163.16	33.98	139.92	129.17	7.51	OSF1.50	8030.00	7992.91				MinPl-O-ADP
143.61	39.26	116.82	104.35	5.68	OSF1.50	9290.00	9252.91				MinPl-CtCt
143.64	39.32	116.81	104.32	5.67	OSF1.50	9300.00	9262.91				MinPls
144.10	39.52	117.15	104.58	5.66	OSF1.50	9330.00	9292.91				MinPl-O-SF
2673.47	108.93	2600.33	2564.54	37.32	OSF1.50	15880.00	12520.00				MinPl-CtCt
2673.89	110.30	2599.84	2563.59	36.86	OSF1.50	15950.00	12520.00				MINPT-O-EOU
2674.54	111.08	2599.97	2563.46	36.60	OSF1.50	15990.00	12520.00				MinPl-O-ADP
2673.58	117.94	2594.44	2555.64	34.43	OSF1.50	16190.00	12520.00				MinPl-CtCt
2664.91	150.18	2564.28	2514.73	26.88	OSF1.50	17280.00	12520.00				MinPl-CtCt
2665.87	153.26	2563.18	2512.60	26.34	OSF1.50	17410.00	12520.00				MINPT-O-EOU
2666.79	154.38	2563.35	2512.41	26.16	OSF1.50	17460.00	12520.00				MinPl-O-ADP
2667.44	165.99	2556.27	2501.45	24.32	OSF1.50	17810.00	12520.00				MinPl-CtCt
2654.43	187.14	2529.15	2467.29	21.44	OSF1.50	18520.00	12520.00				MinPl-CtCt
2654.83	186.31	2528.77	2466.51	21.31	OSF1.50	18580.00	12520.00				MINPT-O-EOU
2655.47	189.08	2528.91	2466.39	21.23	OSF1.50	18620.00	12520.00				MinPl-O-ADP
2657.72	194.08	2527.82	2463.64	20.69	OSF1.50	18780.00	12520.00				MINPT-O-EOU
2658.65	195.19	2528.01	2463.46	20.58	OSF1.50	18830.00	12520.00				MinPl-O-ADP
2654.74	233.58	2498.51	2421.16	17.15	OSF1.50	20070.00	12520.00				MinPl-CtCt
2654.55	244.94	2490.74	2409.61	16.35	OSF1.50	20450.00	12520.00				MinPl-CtCt
2655.60	248.04	2489.73	2407.57	16.15	OSF1.50	20580.00	12520.00				MINPT-O-EOU
2623.65	277.85	2437.90	2345.80	14.23	OSF1.50	21550.00	12520.00				MinPl-CtCt

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	Major		
	2625.00	281.42	2436.87	2343.57	14.06		OSF1.50	21700.00	12520.00					MINPT-O-EOU MinPt-O-ADP MinPts MinPt-O-SF
	2626.16	282.83	2437.09	2343.33	14.00		OSF1.50	21760.00	12520.00					
	2656.85	296.70	2458.53	2360.15	13.49		OSF1.50	22290.00	12520.00					
	2675.90	302.37	2473.80	2373.53	13.33		OSF1.50	22554.23	12520.00					

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #73H
ST01 Off- 19710ft (Surcon
Corrected) (Def Survey)

549.87	32.81	548.07	517.07	N/A		MAS = 10.00 (m)	0.00	0.00				Surface
549.87	32.81	548.06	517.06	494774.10		MAS = 10.00 (m)	23.00	23.00				WRP
549.60	32.81	546.71	516.79	506.33		MAS = 10.00 (m)	290.00	290.00				MinPts
548.82	32.81	543.65	516.01	162.50		MAS = 10.00 (m)	800.00	800.00				MinPts
548.99	32.81	543.46	516.18	147.26		MAS = 10.00 (m)	890.00	890.00				MINPT-O-EOU
188.56	32.81	147.08	135.75	8.48		MAS = 10.00 (m)	6650.00	6613.06				MinPt-O-SF
182.16	32.81	139.75	129.35	7.76		MAS = 10.00 (m)	7690.00	7652.91				MinPts
162.25	33.07	139.62	129.18	7.69		OSF1.50	7780.00	7742.91				MINPT-O-EOU
162.34	33.18	139.64	129.16	7.66		OSF1.50	7810.00	7772.91				MinPt-O-ADP
163.00	33.80	139.89	129.20	7.55		OSF1.50	7980.00	7942.91				MINPT-O-EOU
163.16	33.98	139.92	129.17	7.51		OSF1.50	8030.00	7992.91				MinPt-O-ADP
143.61	39.26	116.82	104.35	5.68		OSF1.50	9290.00	9252.91				MinPt-CtCt
143.64	39.32	116.81	104.32	5.67		OSF1.50	9300.00	9282.91				MinPts
144.10	39.52	117.15	104.58	5.68		OSF1.50	9330.00	9292.91				MinPt-O-SF
2526.94	32.81	2504.79	2494.13	121.93		MAS = 10.00 (m)	12470.00	12379.74				MinPt-O-SF
2508.03	43.27	2478.70	2464.76	89.87		OSF1.50	13650.00	12520.00				MinPt-CtCt
2486.74	70.88	2439.00	2415.86	53.68		OSF1.50	14660.00	12520.00				MinPt-CtCt
2487.14	71.98	2438.67	2415.16	52.86		OSF1.50	14720.00	12520.00				MINPT-O-EOU
2487.45	72.35	2438.74	2415.10	52.59		OSF1.50	14740.00	12520.00				MinPt-O-ADP
2477.39	95.61	2413.17	2381.78	39.44		OSF1.50	15520.00	12520.00				MinPt-CtCt
2477.52	96.05	2413.01	2381.47	39.26		OSF1.50	15550.00	12520.00				MINPT-O-EOU
2477.75	96.34	2413.05	2381.41	39.14		OSF1.50	15570.00	12520.00				MinPt-O-ADP
2478.35	111.72	2403.39	2366.63	33.69		OSF1.50	16070.00	12520.00				MinPt-CtCt
2478.64	112.62	2403.08	2366.02	33.42		OSF1.50	16120.00	12520.00				MINPT-O-EOU
2479.10	113.15	2403.19	2365.95	33.27		OSF1.50	16150.00	12520.00				MinPt-O-ADP
2474.44	127.11	2389.22	2347.34	29.52		OSF1.50	16590.00	12520.00				MinPt-CtCt
2475.14	129.38	2388.41	2345.76	29.00		OSF1.50	16690.00	12520.00				MINPT-O-EOU
2455.74	171.21	2341.11	2284.52	21.68		OSF1.50	18070.00	12520.00				MinPt-CtCt
2456.71	186.50	2331.89	2270.21	19.90		OSF1.50	18580.00	12520.00				MinPt-CtCt
2457.00	192.77	2328.01	2264.23	19.25		OSF1.50	18790.00	12520.00				MinPt-CtCt
2457.70	195.65	2326.79	2262.05	18.97		OSF1.50	18910.00	12520.00				MINPT-O-EOU
2458.20	196.24	2326.88	2261.96	18.92		OSF1.50	18940.00	12520.00				MinPt-O-ADP
2458.72	204.43	2321.95	2254.29	18.16		OSF1.50	19180.00	12520.00				MinPt-CtCt
2459.29	212.20	2317.35	2247.10	17.49		OSF1.50	19440.00	12520.00				MinPt-CtCt
2459.15	227.74	2306.84	2231.40	16.29		OSF1.50	19960.00	12520.00				MinPt-CtCt
2451.22	263.22	2275.26	2188.00	14.04		OSF1.50	21140.00	12520.00				MinPt-CtCt
2454.51	292.33	2259.14	2162.17	12.65		OSF1.50	22110.00	12520.00				MinPt-CtCt
2455.30	301.36	2253.91	2153.94	12.27		OSF1.50	22410.00	12520.00				MinPt-CtCt
2455.71	305.60	2251.50	2150.11	12.10		OSF1.50	22554.23	12520.00				MinPts

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

529.87	32.81	528.07	497.07	N/A		MAS = 10.00 (m)	0.00	0.00				Surface
												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		
	529.87	32.81	528.07	N/A	MAS = 10.00 (m)	23.00	23.00			WRP	
	527.25	32.81	520.71	111.03	MAS = 10.00 (m)	1060.00	1060.00			MINPT-O-EOU	
	498.32	32.81	485.01	42.66	MAS = 10.00 (m)	2730.00	2729.75			MinPt-O-SF	
	179.42	32.81	160.46	146.61	MAS = 10.00 (m)	5750.00	5720.97			MinPts	
	179.44	32.81	160.45	146.63	MAS = 10.00 (m)	5780.00	5730.87			MINPT-O-EOU	
	182.58	32.81	163.08	149.77	MAS = 10.00 (m)	5920.00	5889.31			MinPt-O-SF	
	283.44	36.90	238.33	226.54	OSF1.50	8770.00	8732.91			MinPt-CtCt	
	263.47	36.94	238.33	226.53	OSF1.50	8780.00	8742.91			MinPts	
	264.44	37.17	239.14	227.27	OSF1.50	8830.00	8792.91			MinPt-O-SF	
	3145.76	91.30	3064.43	3054.48	OSF1.50	15540.00	12520.00			MinPt-CtCt	
	3146.72	93.98	3083.59	3052.74	OSF1.50	15660.00	12520.00			MINPT-O-EOU	
	3147.85	95.32	3083.82	3052.53	OSF1.50	15720.00	12520.00			MinPt-O-ADP	
	3159.39	112.14	3084.15	3047.24	OSF1.50	16280.00	12520.00			MinPt-CtCt	
	3161.61	136.26	3070.30	3025.36	OSF1.50	17080.00	12520.00			MinPt-CtCt	
	3168.18	177.06	3049.66	2991.12	OSF1.50	18460.00	12520.00			MinPt-CtCt	
	3167.77	184.17	3044.51	2983.60	OSF1.50	18700.00	12520.00			MinPt-CtCt	
	3163.73	232.93	3007.96	2930.79	OSF1.50	20330.00	12520.00			MinPt-CtCt	
	3157.86	251.77	2969.54	2906.09	OSF1.50	20960.00	12520.00			MinPt-CtCt	
	3164.80	266.78	2986.47	2898.02	OSF1.50	21500.00	12520.00			MINPT-O-EOU	
	3167.47	271.64	2965.90	2895.83	OSF1.50	21660.00	12520.00			MINPT-O-EOU	
	3169.65	278.04	2983.81	2891.61	OSF1.50	21840.00	12520.00			MinPt-CtCt	
	3163.28	299.58	2963.08	2863.70	OSF1.50	22554.23	12520.00			MinPts	

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

Pass										
1219.89	32.81	1218.08	1187.08	N/A	MAS = 10.00 (m)	0.00	0.00			MinPts
1219.90	32.81	1218.08	1187.09	68765.66	MAS = 10.00 (m)	23.00	23.00			WRP
1220.04	32.81	1218.02	1187.24	5562.49	MAS = 10.00 (m)	90.00	90.00			MINPT-O-EOU
1220.24	32.81	1217.98	1187.43	2771.97	MAS = 10.00 (m)	140.00	140.00			MINPT-O-EOU
1215.79	32.81	1209.62	1182.98	278.23	MAS = 10.00 (m)	1040.00	1040.00			MINPT-O-EOU
1093.95	32.81	1080.79	1061.14	95.44	MAS = 10.00 (m)	2900.00	2898.70			MinPts
1093.66	32.81	1080.50	1060.85	95.43	MAS = 10.00 (m)	2910.00	2908.60			MinPts
1088.24	32.81	1074.92	1055.43	93.75	MAS = 10.00 (m)	3350.00	3344.32			MinPts
1088.24	32.81	1074.92	1055.43	93.73	MAS = 10.00 (m)	3360.00	3354.22			MINPT-O-EOU
1087.38	32.81	1073.74	1054.57	91.11	MAS = 10.00 (m)	3610.00	3601.79			MinPts
1087.39	32.81	1073.73	1054.58	90.94	MAS = 10.00 (m)	3630.00	3621.60			MINPT-O-EOU
1075.60	32.81	1059.04	1042.79	72.48	MAS = 10.00 (m)	4770.00	4750.50			MINPT-O-EOU
1061.73	32.81	1040.68	1028.93	54.62	MAS = 10.00 (m)	6100.00	6067.56			MinPts
1056.48	33.02	1033.92	1023.46	50.42	OSF1.50	6500.00	6463.74			MinPts
887.03	39.10	860.29	847.92	35.77	OSF1.50	8780.00	8742.91			MinPt-O-SF
887.07	39.21	860.26	847.85	35.67	OSF1.50	8810.00	8772.91			MINPT-O-EOU
887.10	39.25	860.27	847.85	35.64	OSF1.50	8820.00	8782.91			MinPt-O-ADP
895.46	39.97	868.16	855.46	35.28	OSF1.50	9040.00	9002.91			MinPt-O-SF
3253.76	135.44	3162.97	3118.34	36.43	OSF1.50	16910.00	12520.00			MinPt-CtCt
3254.47	137.48	3162.29	3116.98	35.89	OSF1.50	17010.00	12520.00			MINPT-O-EOU
3255.52	138.75	3162.50	3116.77	35.57	OSF1.50	17070.00	12520.00			MinPt-O-ADP
3271.67	153.54	3168.80	3118.13	32.27	OSF1.50	17580.00	12520.00			MinPt-O-ADP
3284.97	172.47	3169.48	3112.50	28.81	OSF1.50	18160.00	12520.00			MinPt-CtCt
3288.42	192.72	3159.43	3095.70	25.79	OSF1.50	18840.00	12520.00			MinPt-CtCt
3288.93	194.28	3158.88	3094.65	25.58	OSF1.50	18920.00	12520.00			MINPT-O-EOU
3289.55	195.06	3159.00	3094.50	25.49	OSF1.50	18960.00	12520.00			MinPt-O-ADP
3290.96	205.24	3153.62	3085.72	24.22	OSF1.50	19260.00	12520.00			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		
3289.56	211.00	3148.38	3078.56	23.55	OSF1.50	19450.00	12520.00			MinPt-CtCt	
3291.25	214.90	3147.47	3076.35	23.13	OSF1.50	19620.00	12520.00			MINPT-O-EOU	
3292.15	216.27	3147.48	3075.89	22.99	OSF1.50	19670.00	12520.00			MINPT-O-EOU	
3297.34	225.24	3146.66	3072.10	22.10	OSF1.50	19960.00	12520.00			MINPT-O-EOU	
3298.64	226.80	3146.92	3071.83	21.96	OSF1.50	20030.00	12520.00			MinPt-O-ADP	
3265.03	262.13	3069.76	3002.90	18.79	OSF1.50	21160.00	12520.00			MinPt-CtCt	
3266.12	265.01	3088.93	3001.10	18.59	OSF1.50	21290.00	12520.00			MINPT-O-EOU	
3272.04	271.63	3090.44	3000.41	18.16	OSF1.50	21540.00	12520.00			MinPt-O-ADP	
3274.64	275.06	3080.75	2999.57	17.95	OSF1.50	21640.00	12520.00			MINPT-O-EOU	
3275.66	303.98	3072.50	2971.68	16.24	OSF1.50	22554.23	12520.00			MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #44H
MWD 0ft-19884ft (Surcon
Corrected) (Def Survey)

1239.89	32.81	1238.08	1207.08	N/A	MAS = 10.00 (m)	0.00	0.00			MinPts	Pass
1239.89	32.81	1238.06	1207.06	69116.50	MAS = 10.00 (m)	23.00	23.00			WRP	
1239.10	32.81	1234.07	1206.30	383.83	MAS = 10.00 (m)	770.00	770.00			MinPts	
1239.25	32.81	1233.20	1206.44	292.05	MAS = 10.00 (m)	1010.00	1010.00			MinPts	
1239.26	32.81	1233.04	1206.46	280.36	MAS = 10.00 (m)	1050.00	1050.00			MINPT-O-EOU	
1239.93	32.81	1232.64	1207.12	227.57	MAS = 10.00 (m)	1270.00	1270.00			MINPT-O-EOU	
1233.41	32.81	1220.69	1200.60	111.30	MAS = 10.00 (m)	2600.00	2599.98			MinPt-O-SF	
1214.85	32.81	1202.33	1182.04	111.71	MAS = 10.00 (m)	2830.00	2829.27			MinPt-O-SF	
1211.77	32.81	1199.29	1178.96	111.78	MAS = 10.00 (m)	2900.00	2898.70			MINPT-O-EOU	
1203.43	32.81	1190.91	1170.62	110.77	MAS = 10.00 (m)	3350.00	3344.32			MinPts	
1203.43	32.81	1190.90	1170.63	110.65	MAS = 10.00 (m)	3370.00	3364.13			MINPT-O-EOU	
1210.97	32.81	1196.95	1178.16	97.92	MAS = 10.00 (m)	4240.00	4225.66			MinPts	
1207.16	32.81	1192.19	1174.35	90.63	MAS = 10.00 (m)	4570.00	4552.45			MinPts	
1207.18	32.81	1192.15	1174.36	90.22	MAS = 10.00 (m)	4590.00	4572.25			MINPT-O-EOU	
1217.17	32.81	1197.98	1184.36	68.87	MAS = 10.00 (m)	5750.00	5720.97			MinPts	
1217.22	32.81	1197.95	1184.41	68.58	MAS = 10.00 (m)	5770.00	5740.77			MINPT-O-EOU	
1263.99	32.81	1242.31	1231.18	62.69	MAS = 10.00 (m)	6444.82	6409.03			MinPt-O-SF	
1218.09	39.83	1191.01	1178.27	47.72	OSF1.50	9420.00	9382.91			MinPt-CtCt	
1218.13	39.98	1190.95	1178.15	47.53	OSF1.50	9450.00	9412.91			MINPT-O-EOU	
1218.17	40.02	1190.95	1178.14	47.48	OSF1.50	9460.00	9422.91			MinPt-O-ADP	
1225.91	40.55	1198.36	1185.37	47.10	OSF1.50	9630.00	9592.91			MinPt-O-SF	
2841.14	44.24	2811.16	2796.90	99.52	OSF1.50	13670.00	12520.00			MinPt-CtCt	
2841.80	46.22	2810.50	2795.57	95.13	OSF1.50	13790.00	12520.00			MINPT-O-EOU	
2842.65	47.25	2810.67	2795.40	93.02	OSF1.50	13850.00	12520.00			MinPt-O-ADP	
2815.91	105.70	2744.96	2710.21	40.49	OSF1.50	16040.00	12520.00			MinPt-CtCt	
2816.63	107.85	2744.25	2708.78	39.68	OSF1.50	16140.00	12520.00			MINPT-O-EOU	
2795.57	156.99	2690.43	2638.58	26.94	OSF1.50	17800.00	12520.00			MinPt-CtCt	
2795.35	167.02	2683.52	2628.33	25.31	OSF1.50	18140.00	12520.00			MinPt-CtCt	
2792.81	185.91	2668.38	2606.89	22.70	OSF1.50	18780.00	12520.00			MinPt-CtCt	
2788.78	238.06	2629.59	2550.72	17.67	OSF1.50	20530.00	12520.00			MinPt-CtCt	
2791.46	253.26	2622.14	2538.20	16.62	OSF1.50	21070.00	12520.00			MINPT-O-EOU	
2795.79	259.58	2622.28	2536.21	16.24	OSF1.50	21290.00	12520.00			MINPT-O-EOU	
2798.06	262.18	2622.80	2535.88	16.09	OSF1.50	21390.00	12520.00			MinPt-O-ADP	
2808.31	280.95	2620.53	2527.36	15.06	OSF1.50	22000.00	12520.00			MINPT-O-EOU	
2814.62	298.56	2615.10	2516.08	14.20	OSF1.50	22554.23	12520.00			MinPts	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #43H
MWD 0ft-19167ft (Surcon
Corrected) (Def Survey)

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		
1259.88	32.81	1258.07	1227.07	N/A	MAS = 10.00 (m)	0.00	0.00			MinPls	
1259.88	32.81	1258.06	1227.08	61842.78	MAS = 10.00 (m)	23.00	23.00			WRP	
1260.62	32.81	1256.02	1227.81	450.22	MAS = 10.00 (m)	670.00	670.00			MinPls	
1260.96	32.81	1254.75	1228.15	286.48	MAS = 10.00 (m)	1050.00	1050.00			MINPT-O-EOU	
1260.98	32.81	1253.68	1227.87	236.00	MAS = 10.00 (m)	1280.00	1260.00			MinPls	
1261.03	32.81	1253.35	1228.22	209.01	MAS = 10.00 (m)	1410.00	1410.00			MINPT-O-EOU	
1278.70	32.81	1266.02	1245.89	115.77	MAS = 10.00 (m)	2600.00	2599.98			MinPt-O-SF	
1308.09	32.81	1295.55	1275.29	119.91	MAS = 10.00 (m)	2900.00	2898.70			MinPls	
1787.81	32.81	1767.09	1755.00	93.11	MAS = 10.00 (m)	6444.82	6409.03			MinPt-O-SF	
1826.84	34.47	1803.35	1792.38	83.16	OSF1.50	8520.00	8482.91			MinPt-O-ADP	
1870.68	38.01	1844.83	1832.67	76.88	OSF1.50	9450.00	9412.91			MinPt-O-SF	
1884.84	38.29	1858.80	1846.55	76.87	OSF1.50	9530.00	9492.91			MinPt-O-SF	
3708.90	45.23	3676.27	3661.67	126.91	OSF1.50	13680.00	12520.00			MinPt-CtCt	
3684.36	79.72	3630.73	3604.64	70.57	OSF1.50	15080.00	12520.00			MinPt-CtCt	
3686.87	86.41	3628.79	3600.46	65.06	OSF1.50	15380.00	12520.00			MINPT-O-EOU	
3663.36	122.04	3561.52	3541.32	45.55	OSF1.50	16580.00	12520.00			MinPt-CtCt	
3664.17	131.36	3576.12	3532.81	42.29	OSF1.50	16900.00	12520.00			MinPt-CtCt	
3663.58	142.76	3567.92	3520.81	38.87	OSF1.50	17290.00	12520.00			MinPt-CtCt	
3663.87	147.16	3565.28	3516.71	37.70	OSF1.50	17400.00	12520.00			MinPt-CtCt	
3665.81	160.67	3558.21	3505.14	34.52	OSF1.50	17900.00	12520.00			MinPt-CtCt	
3658.59	195.01	3528.11	3463.59	28.34	OSF1.50	19080.00	12520.00			MinPt-CtCt	
3659.41	197.33	3527.38	3462.08	28.01	OSF1.50	19170.00	12520.00			MINPT-O-EOU	
3648.18	237.60	3489.30	3410.58	23.16	OSF1.50	20490.00	12520.00			MinPt-CtCt	
3648.66	239.16	3488.74	3409.50	23.01	OSF1.50	20570.00	12520.00			MINPT-O-EOU	
3656.79	252.62	3487.90	3404.17	21.83	OSF1.50	21030.00	12520.00			MINPT-O-EOU	
3655.53	270.16	3474.95	3385.38	20.40	OSF1.50	21580.00	12520.00			MinPt-CtCt	
3659.15	281.56	3470.97	3377.59	19.59	OSF1.50	22000.00	12520.00			MINPT-O-EOU	
3658.53	299.29	3458.53	3359.24	18.42	OSF1.50	22554.23	12520.00			MinPls	
2458.67	32.81	2456.97	2425.86	N/A	MAS = 10.00 (m)	0.00	0.00			MinPls	
2458.69	32.81	2456.96	2425.89	67449.56	MAS = 10.00 (m)	23.00	23.00			WRP	
2458.75	32.81	2456.95	2425.95	22629.29	MAS = 10.00 (m)	50.00	50.00			MINPT-O-EOU	
2277.38	32.81	2263.74	2244.57	189.77	MAS = 10.00 (m)	2790.00	2789.50			MinPt-O-SF	
2275.49	32.81	2261.85	2242.68	189.66	MAS = 10.00 (m)	2880.00	2878.89			MinPt-O-SF	
2275.48	32.81	2261.83	2242.67	189.66	MAS = 10.00 (m)	2890.00	2888.80			MinPls	
2275.50	32.81	2261.85	2242.69	189.66	MAS = 10.00 (m)	2900.00	2898.70			MINPT-O-EOU	
2275.33	32.81	2261.65	2242.52	189.06	MAS = 10.00 (m)	3030.00	3027.44			MinPls	
2275.33	32.81	2261.64	2242.52	189.00	MAS = 10.00 (m)	3040.00	3037.34			MinPls	
2275.40	32.81	2261.70	2242.60	188.75	MAS = 10.00 (m)	3080.00	3076.95			MINPT-O-EOU	
2278.59	32.81	2264.93	2245.78	189.69	MAS = 10.00 (m)	3350.00	3344.32			MinPt-O-SF	
2292.54	32.81	2276.93	2259.73	163.90	MAS = 10.00 (m)	4420.00	4403.91			MinPls	
2292.55	32.81	2276.92	2259.74	163.61	MAS = 10.00 (m)	4430.00	4413.81			MINPT-O-EOU	
2301.84	32.81	2281.83	2269.03	125.06	MAS = 10.00 (m)	5610.00	5582.33			MinPls	
2301.93	32.81	2281.71	2269.13	123.68	MAS = 10.00 (m)	5670.00	5641.74			MINPT-O-EOU	
2311.16	34.34	2287.73	2276.82	105.83	OSF1.50	6500.00	6463.74			MinPt-O-SF	
2063.07	42.88	2033.76	2020.19	75.93	OSF1.50	9210.00	9172.91			MinPt-CtCt	
2063.08	42.91	2033.75	2020.17	75.86	OSF1.50	9220.00	9182.91			MINPT-O-EOU	
2063.11	42.95	2033.76	2020.16	75.80	OSF1.50	9230.00	9192.91			MinPt-O-ADP	
2070.59	45.66	2039.44	2024.93	71.31	OSF1.50	9890.00	9842.91			MinPt-CtCt	

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

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	Major	
	2070.70	45.95	2039.35	70.83	OSF1.50	9950.00	9912.91				MINPT-O-EOU
	2070.85	46.12	2039.38	70.56	OSF1.50	9990.00	9952.91				MinPt-O-ADP
	2071.27	46.68	2039.43	69.89	OSF1.50	10110.00	10072.91				MINPT-O-EOU
	2071.34	46.77	2039.45	69.55	OSF1.50	10130.00	10092.91				MinPt-O-ADP
	2073.38	48.15	2040.56	67.52	OSF1.50	10420.00	10382.91				MinPt-O-ADP
	2074.53	50.30	2040.29	64.53	OSF1.50	10860.00	10822.91				MinPt-CtCt
	2074.58	50.44	2040.24	64.36	OSF1.50	10890.00	10852.91				MINPT-O-EOU
	2074.62	50.48	2040.26	64.30	OSF1.50	10900.00	10862.91				MinPt-O-ADP
	2039.48	64.59	1995.74	48.88	OSF1.50	13230.00	12520.00				MinPt-CtCt
	2039.81	66.23	1964.98	47.62	OSF1.50	13350.00	12520.00				MINPT-O-EOU
	2040.12	66.60	1995.04	47.35	OSF1.50	13380.00	12520.00				MinPt-O-ADP
	2048.08	70.85	2000.17	44.59	OSF1.50	13640.00	12520.00				MINPT-O-EOU
	2052.83	76.32	2001.28	41.40	OSF1.50	13930.00	12520.00				MinPt-O-ADP
	2056.89	80.25	2002.72	39.40	OSF1.50	14120.00	12520.00				MinPt-O-ADP
	2062.12	100.09	1984.72	31.51	OSF1.50	14950.00	12520.00				MinPt-CtCt
	2062.41	100.95	1964.44	31.24	OSF1.50	15000.00	12520.00				MINPT-O-EOU
	2062.69	101.29	1984.49	31.13	OSF1.50	15020.00	12520.00				MinPt-O-ADP
	2060.55	114.77	1963.36	27.38	OSF1.50	15520.00	12520.00				MinPt-CtCt
	2060.83	115.68	1983.04	27.17	OSF1.50	15570.00	12520.00				MINPT-O-EOU
	2061.27	116.22	1963.11	27.05	OSF1.50	15600.00	12520.00				MinPt-O-ADP
	2061.20	124.11	1977.78	25.30	OSF1.50	15870.00	12520.00				MinPt-CtCt
	2056.81	144.15	1960.04	21.69	OSF1.50	16600.00	12520.00				MinPt-CtCt
	2052.56	166.56	1940.85	18.89	OSF1.50	17390.00	12520.00				MinPt-CtCt
	2047.88	177.05	1929.17	17.53	OSF1.50	17760.00	12520.00				MinPt-CtCt
	2049.01	179.77	1928.48	17.28	OSF1.50	17880.00	12520.00				MINPT-O-EOU
	2051.46	187.89	1925.53	16.54	OSF1.50	18160.00	12520.00				MINPT-O-EOU
	2052.63	191.72	1924.14	16.21	OSF1.50	18270.00	12520.00				MinPt-CtCt
	2053.11	193.14	1923.68	16.10	OSF1.50	18340.00	12520.00				MINPT-O-EOU
	2053.60	193.74	1923.77	16.05	OSF1.50	18370.00	12520.00				MinPt-O-ADP
	2058.53	199.19	1925.07	15.64	OSF1.50	18570.00	12520.00				MinPt-O-ADP
	2065.80	211.38	1924.21	14.78	OSF1.50	18950.00	12520.00				MinPt-CtCt
	2066.40	213.73	1923.25	14.62	OSF1.50	19050.00	12520.00				MINPT-O-EOU
	2067.05	214.54	1923.36	14.57	OSF1.50	19090.00	12520.00				MinPt-O-ADP
	2042.55	248.40	1876.27	12.42	OSF1.50	20210.00	12520.00				MinPt-CtCt
	2043.00	249.60	1875.92	12.37	OSF1.50	20270.00	12520.00				MINPT-O-EOU
	2044.59	251.48	1876.26	12.28	OSF1.50	20350.00	12520.00				MinPt-O-ADP
	2065.00	280.60	1877.26	11.11	OSF1.50	21290.00	12520.00				MinPt-CtCt
	2059.96	291.35	1865.06	10.67	OSF1.50	21650.00	12520.00				MinPt-CtCt
	2061.44	295.97	1863.48	10.51	OSF1.50	21830.00	12520.00				MINPT-O-EOU
	2062.65	297.38	1863.73	10.46	OSF1.50	21890.00	12520.00				MinPt-O-ADP
	2060.73	318.70	1847.60	9.75	OSF1.50	22554.23	12520.00				MinPts

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

Pass

2458.67	32.81	2456.17	2425.86	N/A	MAS = 10.00 (m)	0.00	0.00	MinPts
2458.69	32.81	2456.16	2425.89	67427.55	MAS = 10.00 (m)	23.00	23.00	WRP
2458.75	32.81	2456.14	2425.95	22621.90	MAS = 10.00 (m)	50.00	50.00	MINPT-O-EOU
2275.48	32.81	2260.95	2242.67	190.38	MAS = 10.00 (m)	2890.00	2888.80	MinPts
2275.50	32.81	2260.97	2242.69	190.36	MAS = 10.00 (m)	2900.00	2898.70	MINPT-O-EOU
2275.33	32.81	2260.76	2242.52	189.68	MAS = 10.00 (m)	3030.00	3027.44	MinPts
2275.33	32.81	2260.78	2242.52	189.60	MAS = 10.00 (m)	3040.00	3037.34	MINPT-O-EOU
2275.40	32.81	2260.81	2242.60	189.32	MAS = 10.00 (m)	3080.00	3076.95	MinPt-O-SF

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		
2292.54	32.81	2276.00	2259.73	163.90	MAS = 10.00 (m)	4420.00	4403.91			MinPls	
2292.55	32.81	2275.98	2259.74	163.61	MAS = 10.00 (m)	4430.00	4413.81			MINPT-O-EOU	MinPls
2301.84	32.81	2280.88	2269.03	124.94	MAS = 10.00 (m)	5610.00	5582.33			MinPls	
2301.93	32.81	2280.77	2269.13	123.53	MAS = 10.00 (m)	5670.00	5641.74			MINPT-O-EOU	MinPls
2311.16	35.29	2286.78	2275.87	105.73	OSF1.50	8500.00	8463.74			MinPlt-O-SF	MinPlt-CtCt
2063.07	43.82	2032.82	2019.25	75.88	OSF1.50	9210.00	9172.91			MinPlt-CtCt	MinPlt-CtCt
2063.08	43.85	2032.81	2019.23	75.82	OSF1.50	9220.00	9182.91			MINPT-O-EOU	MinPlt-O-EOU
2063.11	43.89	2032.82	2019.22	75.76	OSF1.50	9230.00	9192.91			MinPlt-O-ADP	MinPlt-O-ADP
2070.59	46.59	2038.50	2024.00	71.28	OSF1.50	9880.00	9842.91			MinPlt-CtCt	MinPlt-CtCt
2070.70	46.89	2038.42	2023.81	70.79	OSF1.50	9950.00	9912.91			MINPT-O-EOU	MinPlt-O-EOU
2070.85	47.06	2038.45	2023.79	70.52	OSF1.50	9990.00	9952.91			MinPlt-O-ADP	MinPlt-O-ADP
2071.27	47.61	2038.51	2023.66	69.67	OSF1.50	10110.00	10072.91			MINPT-O-EOU	MinPlt-O-EOU
2071.34	47.70	2038.52	2023.65	69.53	OSF1.50	10130.00	10092.91			MinPlt-O-ADP	MinPlt-O-ADP
2073.33	49.01	2039.63	2024.32	67.60	OSF1.50	10410.00	10372.91			MinPlt-O-ADP	MinPlt-O-ADP
2074.53	51.21	2039.37	2023.32	64.54	OSF1.50	10860.00	10822.91			MinPlt-CtCt	MinPlt-CtCt
2074.58	51.35	2039.33	2023.23	64.36	OSF1.50	10890.00	10852.91			MINPT-O-EOU	MinPlt-O-EOU
2074.62	51.39	2039.34	2023.23	64.30	OSF1.50	10900.00	10862.91			MinPlt-O-ADP	MinPlt-O-ADP
2141.75	56.11	2103.40	2085.64	60.21	OSF1.50	12020.00	11982.91			MinPlt-O-SF	MinPlt-O-SF
2183.94	57.46	2154.74	2136.48	60.01	OSF1.50	12370.00	12308.85			MinPls	MinPls
2200.95	57.65	2161.64	2143.31	59.94	OSF1.50	12480.00	12385.98			MinPlt-O-SF	MinPlt-O-SF
2203.48	57.69	2164.15	2145.79	59.94	OSF1.50	12510.00	12403.72			MinPlt-O-SF	MinPlt-O-SF
2227.50	58.13	2187.91	2169.37	59.98	OSF1.50	12720.00	12482.82			MinPlt-O-SF	MinPlt-O-SF
10320.40	70.70	10272.43	10249.70	226.95	OSF1.50	22554.23	12520.00			TD	TD

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #3H MWD
0ft-22454' (Surcon Corrected)
(Def Survey)

Pass

2478.61	32.81	2476.95	2445.80	858423.60	MAS = 10.00 (m)	0.00	0.00			Surface	
2478.56	32.81	2476.84	2445.75	39145.05	MAS = 10.00 (m)	23.00	23.00			WRP	
2476.11	32.81	2473.27	2443.30	1895.21	MAS = 10.00 (m)	310.00	310.00			MinPls	
2476.15	32.81	2473.22	2443.34	1782.40	MAS = 10.00 (m)	330.00	330.00			MINPT-O-EOU	MinPls
2475.33	32.81	2467.32	2442.52	382.52	MAS = 10.00 (m)	1490.00	1490.00			MinPls	
2413.16	32.81	2400.35	2380.35	214.65	MAS = 10.00 (m)	2600.00	2599.98			MinPlt-O-SF	MinPls
2408.71	32.81	2386.04	2375.90	217.10	MAS = 10.00 (m)	2750.00	2749.68			MinPls	
2412.13	32.81	2399.58	2379.32	219.75	MAS = 10.00 (m)	2900.00	2898.70			MinPls	
2635.44	32.81	2613.74	2602.63	130.67	MAS = 10.00 (m)	6500.00	6463.74			MinPlt-O-SF	MinPlt-CtCt
2477.83	39.77	2450.77	2438.06	97.41	OSF1.50	9240.00	9202.91			MinPlt-CtCt	MinPlt-CtCt
2477.95	40.14	2450.64	2437.81	96.48	OSF1.50	9320.00	9282.91			MINPT-O-EOU	MinPlt-O-EOU
2478.07	40.28	2450.67	2437.79	96.13	OSF1.50	9350.00	9312.91			MinPlt-O-ADP	MinPlt-O-ADP
2484.70	50.71	2450.35	2433.99	75.88	OSF1.50	11370.00	11332.91			MinPlt-CtCt	MinPlt-CtCt
2484.88	51.28	2450.15	2433.60	75.02	OSF1.50	11460.00	11422.91			MINPT-O-EOU	MinPlt-O-EOU
2485.41	51.94	2450.24	2433.47	74.05	OSF1.50	11570.00	11532.91			MinPlt-O-ADP	MinPlt-O-ADP
2492.42	57.04	2453.85	2435.37	67.39	OSF1.50	12610.00	12451.27			MinPlt-CtCt	MinPlt-CtCt
2492.45	57.16	2453.81	2435.29	67.25	OSF1.50	12630.00	12458.52			MINPT-O-EOU	MinPlt-O-EOU
2492.49	57.21	2453.81	2435.27	67.18	OSF1.50	12640.00	12461.85			MinPlt-O-ADP	MinPlt-O-ADP
2470.59	63.51	2427.74	2407.08	59.76	OSF1.50	13240.00	12520.00			MinPlt-CtCt	MinPlt-CtCt
2470.66	63.71	2427.67	2406.95	59.56	OSF1.50	13260.00	12520.00			MINPT-O-EOU	MinPlt-O-EOU
2470.83	63.93	2427.70	2406.90	59.36	OSF1.50	13280.00	12520.00			MinPlt-O-ADP	MinPlt-O-ADP
2471.88	68.78	2425.52	2403.10	55.10	OSF1.50	13570.00	12520.00			MinPlt-CtCt	MinPlt-CtCt
2468.43	82.76	2412.74	2385.67	45.56	OSF1.50	14260.00	12520.00			MinPlt-CtCt	MinPlt-CtCt
2468.71	83.57	2412.48	2385.14	45.11	OSF1.50	14310.00	12520.00			MINPT-O-EOU	MinPlt-O-EOU
2469.27	84.29	2412.57	2384.96	44.73	OSF1.50	14350.00	12520.00			MinPlt-O-ADP	MinPlt-O-ADP
2472.17	92.31	2410.12	2379.86	40.82	OSF1.50	14670.00	12520.00			MinPlt-CtCt	MinPlt-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)	Alert	Minor		
	2472.77	94.11	2409.52	40.04	OSF1.50	14760.00	12520.00			MINPT-O-EOU	
	2473.58	95.11	2409.66	39.62	OSF1.50	14810.00	12520.00			MinPt-O-ADP	
	2477.85	101.79	2409.49	37.05	OSF1.50	15050.00	12520.00			MinPt-CtCt	
	2476.39	117.23	2397.73	32.08	OSF1.50	15640.00	12520.00			MinPt-CtCt	
	2478.95	124.21	2395.63	30.29	OSF1.50	15920.00	12520.00			MINPT-O-EOU	
	2479.33	128.39	2393.23	29.29	OSF1.50	16050.00	12520.00			MinPt-CtCt	
	2477.54	142.04	2382.35	26.43	OSF1.50	16930.00	12520.00			MinPt-CtCt	
	2473.54	152.97	2371.05	24.48	OSF1.50	16930.00	12520.00			MinPt-CtCt	
	2474.62	159.56	2367.73	23.47	OSF1.50	17160.00	12520.00			MinPt-CtCt	
	2473.76	165.84	2362.71	22.57	OSF1.50	17380.00	12520.00			MinPt-CtCt	
	2474.36	174.12	2357.77	21.49	OSF1.50	17670.00	12520.00			MinPt-CtCt	
	2474.09	182.57	2351.87	20.49	OSF1.50	17960.00	12520.00			MinPt-CtCt	
	2474.06	186.54	2349.19	20.05	OSF1.50	18100.00	12520.00			MinPt-CtCt	
	2474.77	188.52	2348.58	19.84	OSF1.50	18190.00	12520.00			MINPT-O-EOU	
	2471.94	199.75	2338.26	18.69	OSF1.50	18550.00	12520.00			MinPt-CtCt	
	2472.03	207.70	2333.05	17.97	OSF1.50	18820.00	12520.00			MinPt-CtCt	
	2470.12	227.14	2318.18	16.41	OSF1.50	19480.00	12520.00			MinPt-CtCt	
	2470.15	231.01	2315.63	16.14	OSF1.50	19610.00	12520.00			MinPt-CtCt	
	2468.87	253.69	2299.23	14.68	OSF1.50	20370.00	12520.00			MinPt-CtCt	
	2469.73	256.25	2298.36	14.53	OSF1.50	20480.00	12520.00			MINPT-O-EOU	
	2470.68	257.39	2298.57	14.48	OSF1.50	20530.00	12520.00			MinPt-O-ADP	
	2472.45	285.47	2281.63	13.05	OSF1.50	21440.00	12520.00			MinPt-CtCt	
	2467.91	303.64	2264.97	12.25	OSF1.50	22050.00	12520.00			MinPt-CtCt	
	2468.46	305.40	2264.34	12.18	OSF1.50	22130.00	12520.00			MINPT-O-EOU	
	2469.17	306.24	2264.50	12.15	OSF1.50	22170.00	12520.00			MinPt-O-ADP	
	2472.79	310.31	2265.40	12.00	OSF1.50	22300.00	12520.00			MINPT-O-EOU	
	2474.50	312.32	2265.78	11.94	OSF1.50	22380.00	12520.00			MinPt-O-ADP	
	2479.81	317.06	2267.94	11.78	OSF1.50	22554.23	12520.00			MinPt-O-SF	

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #2H MWD
0ft-22179ft (Surcon Corrected)
(Def Survey)

Pass									
2498.64	32.81	2497.10	2465.83	N/A	MAS = 10.00 (m)	0.00	0.00	Surface	
2498.63	32.81	2497.04	2465.82	52827.65	MAS = 10.00 (m)	23.00	23.00	WRP	
2497.59	32.81	2492.83	2464.78	776.38	MAS = 10.00 (m)	770.00	770.00	MinPts	
2498.13	32.81	2491.43	2465.32	484.13	MAS = 10.00 (m)	1220.00	1220.00	MinPts	
2492.43	32.81	2479.08	2459.62	211.07	MAS = 10.00 (m)	2570.00	2569.99	MinPts	
2492.45	32.81	2479.07	2459.64	210.52	MAS = 10.00 (m)	2580.00	2579.99	MINPT-O-EOU	
2505.14	32.81	2491.46	2472.33	206.31	MAS = 10.00 (m)	2850.00	2849.13	MinPt-O-SF	
2509.92	32.81	2496.25	2477.12	206.75	MAS = 10.00 (m)	2900.00	2898.70	MinPts	
2620.30	32.81	2605.82	2587.49	202.40	MAS = 10.00 (m)	3890.00	3879.07	MinPt-O-SF	
2645.56	32.81	2630.92	2612.75	201.82	MAS = 10.00 (m)	4120.00	4106.83	MinPt-O-SF	
2921.65	32.81	2900.26	2888.84	147.10	MAS = 10.00 (m)	6444.82	6409.03	MinPt-O-SF	
2892.15	41.94	2863.67	2850.21	107.33	OSF1.50	10000.00	9962.91	MinPt-CtCt	
2892.24	42.23	2863.57	2850.01	106.56	OSF1.50	10050.00	10012.91	MINPT-O-EOU	
2893.33	43.45	2863.85	2849.86	103.51	OSF1.50	10250.00	10212.91	MinPt-O-ADP	
2894.25	44.44	2864.11	2849.81	101.15	OSF1.50	10450.00	10412.91	MINPT-O-EOU	
2894.76	45.03	2864.22	2849.72	99.78	OSF1.50	10550.00	10512.91	MinPt-O-ADP	
2896.17	46.35	2864.75	2849.82	96.89	OSF1.50	10790.00	10752.91	MinPt-O-ADP	
2896.78	46.99	2864.94	2849.79	95.56	OSF1.50	10890.00	10852.91	MinPt-O-ADP	
2885.56	75.40	2834.82	2810.17	58.49	OSF1.50	13950.00	12520.00	MinPt-CtCt	
2887.07	79.01	2833.91	2808.05	55.80	OSF1.50	14140.00	12520.00	MINPT-O-EOU	
2887.50	79.50	2834.02	2808.00	55.46	OSF1.50	14170.00	12520.00	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	Major	
2892.97	86.42	2833.54	2804.55	49.86	OSF1.50	14540.00	12520.00				MinPt-CtCt
2892.91	91.99	2831.10	2800.92	47.90	OSF1.50	14690.00	12520.00				MinPt-CtCt
2893.79	94.41	2830.37	2799.38	46.86	OSF1.50	14810.00	12520.00				MINPT-O-EOU
2894.82	95.65	2830.58	2798.17	46.07	OSF1.50	14870.00	12520.00				MinPt-O-ADP
2895.32	117.76	2806.34	2787.56	37.19	OSF1.50	15690.00	12520.00				MinPt-CtCt
2894.75	121.26	2803.43	2763.49	36.09	OSF1.50	15820.00	12520.00				MinPt-CtCt
2895.18	122.62	2802.95	2762.56	35.69	OSF1.50	15890.00	12520.00				MINPT-O-EOU
2895.83	123.40	2803.09	2762.43	35.47	OSF1.50	15930.00	12520.00				MinPt-O-ADP
2892.76	129.73	2805.79	2763.03	33.81	OSF1.50	16170.00	12520.00				MinPt-CtCt
2896.06	142.48	2800.60	2753.58	30.78	OSF1.50	16590.00	12520.00				MinPt-CtCt
2896.69	163.10	2777.48	2723.59	26.77	OSF1.50	17320.00	12520.00				MinPt-CtCt
2897.19	164.50	2777.05	2722.70	26.55	OSF1.50	17390.00	12520.00				MINPT-O-EOU
2897.70	165.09	2777.16	2722.62	26.46	OSF1.50	17420.00	12520.00				MinPt-O-ADP
2896.87	185.54	2762.70	2701.33	23.51	OSF1.50	18100.00	12520.00				MinPt-CtCt
2897.27	186.74	2762.30	2700.53	23.36	OSF1.50	18160.00	12520.00				MINPT-O-EOU
2897.74	187.32	2762.38	2700.42	23.29	OSF1.50	18190.00	12520.00				MinPt-CtCt
2902.42	197.11	2770.53	2705.30	22.24	OSF1.50	18540.00	12520.00				MinPt-O-ADP
2893.26	212.46	2751.15	2680.81	20.56	OSF1.50	19020.00	12520.00				MinPts
2894.07	214.98	2750.27	2679.09	20.32	OSF1.50	19130.00	12520.00				MinPt-CtCt
2896.67	217.97	2750.88	2678.70	20.06	OSF1.50	19250.00	12520.00				MINPT-O-EOU
2894.10	231.56	2739.24	2662.53	18.85	OSF1.50	19670.00	12520.00				MinPt-CtCt
2895.93	235.85	2738.21	2660.07	18.52	OSF1.50	19840.00	12520.00				MINPT-O-EOU
2897.31	237.53	2738.47	2659.77	18.40	OSF1.50	19910.00	12520.00				MinPt-O-ADP
2904.28	249.01	2737.79	2655.27	17.59	OSF1.50	20260.00	12520.00				MinPt-CtCt
2904.98	250.98	2737.18	2654.00	17.45	OSF1.50	20350.00	12520.00				MINPT-O-EOU
2905.71	251.84	2737.34	2653.88	17.40	OSF1.50	20390.00	12520.00				MinPt-O-ADP
2893.79	267.92	2714.70	2625.87	16.28	OSF1.50	20900.00	12520.00				MinPt-CtCt
2893.93	272.14	2712.02	2621.79	16.03	OSF1.50	21040.00	12520.00				MinPt-CtCt
2894.45	273.86	2711.40	2620.59	15.93	OSF1.50	21120.00	12520.00				MINPT-O-EOU
2893.94	279.89	2706.87	2614.05	15.58	OSF1.50	21300.00	12520.00				MinPt-CtCt
2894.28	281.05	2706.43	2613.23	15.52	OSF1.50	21360.00	12520.00				MINPT-O-EOU
2894.74	281.62	2706.52	2613.12	15.49	OSF1.50	21390.00	12520.00				MinPt-O-ADP
2898.83	303.36	2686.11	2585.47	14.35	OSF1.50	22090.00	12520.00				MinPt-CtCt
2899.12	304.29	2665.78	2584.83	14.30	OSF1.50	22140.00	12520.00				MINPT-O-EOU
2899.57	304.83	2685.87	2584.74	14.28	OSF1.50	22170.00	12520.00				MinPt-O-ADP
2893.74	317.91	2671.32	2565.83	13.66	OSF1.50	22554.23	12520.00				MinPts

Pass	
Surface	0.00
WRP	23.00
MinPts	2470.00
MINPT-O-EOU	2500.00
MinPtO-SF	2599.98
MinPts	2898.70
MinPtO-SF	6463.74
MinPt-CtCt	10542.91
MINPT-O-EOU	10572.91
MinPt-O-ADP	10592.91
MinPtO-SF	11232.91
MinPts	12520.00

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		
Cimarex Vaca Draw 20-17 Federal #30H Rev1 RM 20Feb20 (Def Plan)											
	3138.35	32.81	3136.54	3105.54	N/A	MAS = 10.00 (m)	0.00				Surface
	3138.35	32.81	3136.49	3105.54	62741.84	MAS = 10.00 (m)	23.00				WRP
	3138.35	32.81	3124.47	3105.54	259.88	MAS = 10.00 (m)	1970.00				MinPts
	3138.40	32.81	3124.40	3105.59	257.28	MAS = 10.00 (m)	2000.00				MINPT-O-EOU
	3171.89	32.81	3156.20	3139.08	228.39	MAS = 10.00 (m)	2600.00				MinPt-O-SF
	3233.95	32.81	3218.55	3201.15	237.74	MAS = 10.00 (m)	2900.00				MinPts
	4297.36	41.43	4269.13	4255.92	162.60	OSF1.50	6500.00				MinPt-O-SF
	4370.02	42.12	4341.34	4327.90	162.55	OSF1.50	6820.00				MinPt-O-SF
	4371.28	57.09	4332.62	4314.19	118.56	OSF1.50	9930.00				MinPts
	4496.07	61.31	4454.59	4434.76	113.30	OSF1.50	11070.00				MinPt-O-SF
	4746.71	64.09	4703.38	4682.61	114.27	OSF1.50	11940.00				MinPt-O-SF
	4980.20	343.81	4750.39	4636.39	21.83	OSF1.50	22554.23				MinPts

Cimarex Vaca Draw 20-17 Federal #29H Rev1 RM 20Feb20 (Def Plan)											
	3158.37	32.81	3156.56	3125.56	N/A		0.00				Pass
	3158.37	32.81	3156.51	3125.56	64285.10		0.00			Surface	
	3158.37	32.81	3147.63	3125.56	353.64		23.00			WRP	
	3158.42	32.81	3147.56	3125.61	348.81		1470.00			MinPts	
	3261.52	32.81	3247.07	3228.71	257.82		1500.00			MINPT-O-EOU	
	3334.10	32.81	3319.62	3301.29	262.98		2600.00			MinPt-O-SF	
	4376.96	43.87	4347.11	4333.09	156.00		2599.98			MinPts	
	4494.41	46.68	4462.68	4447.73	150.18		2898.70			MinPt-O-SF	
	4493.34	64.07	4450.03	4429.27	108.21		6463.74			MinPt-O-SF	
	4493.39	64.24	4449.97	4429.16	107.92		7072.91			MinPt-O-SF	
	4493.48	64.35	4449.98	4429.13	107.72		10852.91			MinPt-CtCt	
	4596.02	68.91	4549.48	4527.11	102.70		10920.00			MINPT-O-EOU	
	4736.52	346.18	4505.13	4390.33	20.82		10920.00			MinPt-O-ADP	
							11942.91			MinPt-O-SF	
							12520.00			MinPts	

Final Surveys - Cimarex Vaca Draw 20-17 Federal #8H MWD 01c22328t (Surcon Corrected) (Def Survey)											
	3698.88	32.81	3697.23	3666.08	N/A		0.00				Pass
	3698.90	32.81	3697.20	3666.09	76969.15		0.00			MinPts	
	3699.43	32.81	3696.68	3666.62	3373.58		23.00			WRP	
	3700.32	32.81	3696.14	3667.52	1459.92		290.00			MinPts	
	3695.07	32.81	3686.66	3662.26	546.92		590.00			MINPT-O-EOU	
	3695.21	32.81	3686.51	3662.40	523.83		590.00			MinPts	
	3698.01	32.81	3688.26	3665.21	456.20		1540.00			MINPT-O-EOU	
	3631.73	32.81	3618.67	3598.92	319.26		1600.00			MinPt-O-SF	
	3629.43	32.81	3616.64	3596.62	326.55		1810.00			MinPt-O-SF	
	3629.43	32.81	3616.65	3596.62	326.98		2599.98			MinPt-O-SF	
	3633.11	32.81	3620.38	3600.30	328.53		2749.68			MINPT-O-EOU	
	3641.74	32.81	3628.98	3608.93	328.46		2759.64			MinPts	
	3710.77	32.81	3696.94	3677.96	304.45		2900.00			MinPt-O-SF	
	3865.13	32.81	3843.32	3832.32	191.61		3037.34			MinPt-O-SF	
	3723.35	38.66	3697.01	3684.69	151.10		3948.39			MinPt-CtCt	
	3723.50	39.12	3696.85	3684.39	149.26		6463.74			MinPt-O-SF	
	3723.66	39.30	3696.88	3684.36	148.53		6500.00			MinPt-O-SF	
	3721.84	48.04	3689.24	3673.80	120.47		9052.91			MINPT-O-EOU	
							9152.91			MinPt-O-ADP	
							9192.91			MinPt-CtCt	
							10972.91				

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	
	3721.93	48.31	3689.15	119.79	OSF1.50	11080.00	11022.91				MINPT-O-EOU
	3722.06	48.47	3689.18	119.38	OSF1.50	11090.00	11052.91				MinPt-O-ADP
	3740.71	52.47	3705.21	110.16	OSF1.50	11830.00	11792.91				MINPT-O-EOU
	3740.76	52.52	3705.23	110.04	OSF1.50	11840.00	11802.91				MinPt-O-ADP
		62.68	3682.91	90.80	OSF1.50	13200.00	12520.00				MinPt-CtCt
	3695.21	62.97	3652.83	90.17	OSF1.50	13230.00	12520.00				MINPT-O-EOU
	3695.32	63.07	3652.85	90.03	OSF1.50	13240.00	12520.00				MinPt-O-ADP
	3695.40	71.97	3682.76	79.35	OSF1.50	13800.00	12520.00				MinPt-O-ADP
	3731.23	77.86	3686.96	73.38	OSF1.50	14050.00	12520.00				MinPis
	3739.35	90.46	3665.19	62.79	OSF1.50	14600.00	12520.00				MinPt-CtCt
	3725.96	101.32	3668.51	55.97	OSF1.50	15040.00	12520.00				MinPt-CtCt
	3726.55	107.51	3654.43	52.70	OSF1.50	15280.00	12520.00				MinPt-CtCt
	3726.59	115.41	3650.15	49.05	OSF1.50	15580.00	12520.00				MinPt-CtCt
	3727.58	123.50	3645.04	45.81	OSF1.50	15880.00	12520.00				MinPt-CtCt
	3727.86	125.78	3644.19	44.97	OSF1.50	15990.00	12520.00				MINPT-O-EOU
	3728.54	126.78	3644.36	44.62	OSF1.50	16040.00	12520.00				MinPt-O-ADP
	3729.37	131.16	3641.18	43.11	OSF1.50	16180.00	12520.00				MinPt-CtCt
	3729.12	143.98	3629.25	39.20	OSF1.50	16620.00	12520.00				MinPt-CtCt
	3725.73	157.28	3614.69	35.80	OSF1.50	17090.00	12520.00				MinPt-CtCt
	3720.04	162.05	3610.19	34.73	OSF1.50	17260.00	12520.00				MinPt-CtCt
	3718.72	162.90	3609.91	34.55	OSF1.50	17310.00	12520.00				MINPT-O-EOU
	3719.01	163.40	3610.00	34.44	OSF1.50	17340.00	12520.00				MinPt-O-ADP
	3719.43	167.71	3612.64	33.60	OSF1.50	17510.00	12520.00				MinPis
	3724.94	175.30	3612.96	32.18	OSF1.50	17750.00	12520.00				MINPT-O-EOU
	3730.32	176.58	3613.21	31.95	OSF1.50	17810.00	12520.00				MinPt-O-ADP
	3731.42	205.41	3589.94	27.41	OSF1.50	18750.00	12520.00				MinPt-CtCt
	3727.38	206.68	3589.50	27.24	OSF1.50	18820.00	12520.00				MINPT-O-EOU
	3727.78	207.22	3589.60	27.17	OSF1.50	18850.00	12520.00				MinPt-O-ADP
	3728.24	226.82	3563.99	24.73	OSF1.50	19480.00	12520.00				MinPt-CtCt
	3715.70	228.39	3563.45	24.56	OSF1.50	19560.00	12520.00				MINPT-O-EOU
	3716.22	228.17	3563.59	24.48	OSF1.50	19600.00	12520.00				MinPt-O-ADP
	3716.86	233.67	3563.11	24.02	OSF1.50	19740.00	12520.00				MINPT-O-EOU
	3719.39	234.44	3563.26	23.94	OSF1.50	19780.00	12520.00				MinPt-O-ADP
	3720.05	256.03	3580.05	22.09	OSF1.50	20470.00	12520.00				MinPt-CtCt
	3751.22	257.15	3579.68	22.00	OSF1.50	20530.00	12520.00				MINPT-O-EOU
	3751.58	257.88	3579.77	21.94	OSF1.50	20570.00	12520.00				MinPt-O-ADP
	3752.18	301.84	3516.91	18.56	OSF1.50	22010.00	12520.00				MinPt-CtCt
	3718.63	303.43	3516.32	18.47	OSF1.50	22090.00	12520.00				MINPT-O-EOU
	3719.10	304.21	3516.42	18.42	OSF1.50	22130.00	12520.00				MinPt-O-ADP
	3719.72	317.34	3518.92	17.71	OSF1.50	22554.23	12520.00				MinPis
	3730.97										

Final Surveys - Cimarex Vaca
Draw 20-17 Federal #7H MWD
Ofc-22544ft (Surcon Corrected)
(Def Survey)

Pass

3718.89	32.81	3717.19	3686.09	N/A	MAS = 10.00 (m)	0.00	0.00	MinPis
3718.94	32.81	3717.20	3686.13	95015.35	MAS = 10.00 (m)	23.00	23.00	WRP
3714.89	32.81	3702.01	3682.08	328.63	MAS = 10.00 (m)	2580.00	2579.99	MinPis
3714.97	32.81	3702.06	3682.16	327.84	MAS = 10.00 (m)	2600.00	2599.98	MinPt-O-SF
3732.29	32.81	3719.65	3699.48	337.11	MAS = 10.00 (m)	2900.00	2898.70	MinPis
3774.23	32.81	3761.46	3741.43	336.51	MAS = 10.00 (m)	3320.00	3314.61	MinPt-O-SF
3792.52	32.81	3779.70	3759.71	336.72	MAS = 10.00 (m)	3490.00	3482.96	MinPt-O-SF
3800.05	32.81	3767.20	3767.25	336.45	MAS = 10.00 (m)	3550.00	3542.38	MinPt-O-SF
4138.44	32.81	4117.29	4105.63	211.29	MAS = 10.00 (m)	6500.00	6463.74	MinPt-O-SF

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		
	4141.77	32.81	4120.08	205.53	MAS = 10.00 (m)	7750.00	7712.91			MinPis	
	4141.79	32.81	4120.02	204.92	MAS = 10.00 (m)	7780.00	7742.91			MINPT-O-EOU	
	4143.47	33.13	4120.80	196.87	OSF1.50	8130.00	8092.91			MINPT-O-EOU	
	4143.41	33.20	4120.82	196.42	OSF1.50	8150.00	8112.91			MinPt-O-ADP	
	4188.40	40.97	4140.56	158.61	OSF1.50	9870.00	9832.91			MinPt-CtCt	
	4188.50	41.35	4140.41	157.12	OSF1.50	9950.00	9912.91			MINPT-O-EOU	
	4188.61	41.48	4140.44	156.61	OSF1.50	9980.00	9942.91			MinPt-O-ADP	
	4154.83	50.19	4120.85	128.13	OSF1.50	11520.00	11482.91			MinPt-CtCt	
	4155.01	50.72	4120.67	126.74	OSF1.50	11610.00	11572.91			MINPT-O-EOU	
	4155.46	51.95	4120.31	123.67	OSF1.50	11810.00	11772.91			MINPT-O-EOU	
	4155.64	52.16	4120.34	123.17	OSF1.50	11850.00	11812.91			MinPt-O-ADP	
	4166.55	56.91	4128.13	112.62	OSF1.50	12700.00	12478.15			MinPt-CtCt	
	4140.36	64.64	4096.79	98.23	OSF1.50	13340.00	12520.00			MinPt-CtCt	
	4140.55	65.24	4096.58	96.75	OSF1.50	13390.00	12520.00			MINPT-O-EOU	
	4140.84	65.61	4096.62	97.31	OSF1.50	13420.00	12520.00			MinPt-O-ADP	
	4122.43	85.97	4064.64	73.13	OSF1.50	14400.00	12520.00			MinPt-CtCt	
	4122.98	87.58	4064.12	71.77	OSF1.50	14490.00	12520.00			MINPT-O-EOU	
	4123.74	88.49	4064.26	71.03	OSF1.50	14540.00	12520.00			MinPt-O-ADP	
	4125.05	90.61	4064.17	69.37	OSF1.50	14620.00	12520.00			MINPT-O-EOU	
	4126.41	92.22	4064.45	68.16	OSF1.50	14700.00	12520.00			MINPT-O-EOU	
	4130.06	95.82	4085.70	65.62	OSF1.50	14850.00	12520.00			MinPt-O-ADP	
	4152.11	109.33	4078.74	57.71	OSF1.50	15400.00	12520.00			MinPt-O-ADP	
	4123.04	137.35	4031.00	45.49	OSF1.50	16360.00	12520.00			MinPis	
	4122.58	142.99	4026.77	43.67	OSF1.50	16560.00	12520.00			MinPt-CtCt	
	4123.01	144.29	4026.34	43.28	OSF1.50	16630.00	12520.00			MINPT-O-EOU	
	4123.63	145.03	4026.47	43.06	OSF1.50	16670.00	12520.00			MinPt-O-ADP	
	4126.03	148.85	4026.31	41.97	OSF1.50	16790.00	12520.00			MINPT-O-EOU	
	4126.47	149.37	4026.41	41.83	OSF1.50	16820.00	12520.00			MinPt-O-ADP	
	4151.85	161.05	4044.01	39.01	OSF1.50	17290.00	12520.00			MinPt-CtCt	
	4129.18	210.54	3988.34	29.61	OSF1.50	18900.00	12520.00			MINPT-O-EOU	
	4130.59	214.23	3987.29	29.11	OSF1.50	19060.00	12520.00			MINPT-O-EOU	
	4136.04	222.24	3967.40	28.09	OSF1.50	19330.00	12520.00			MinPt-O-ADP	
	4137.20	223.60	3987.66	27.92	OSF1.50	19390.00	12520.00			MinPt-O-ADP	
	4133.20	247.72	3967.58	25.17	OSF1.50	20160.00	12520.00			MinPt-CtCt	
	4139.97	266.95	3961.53	23.38	OSF1.50	20840.00	12520.00			MINPT-O-EOU	
	4140.88	268.03	3961.72	23.29	OSF1.50	20890.00	12520.00			MinPt-O-ADP	
	4142.99	284.25	3953.00	21.97	OSF1.50	21390.00	12520.00			MinPt-CtCt	
	4135.61	300.69	3934.67	20.72	OSF1.50	21940.00	12520.00			MinPt-CtCt	
	4138.41	303.41	3933.68	20.54	OSF1.50	22060.00	12520.00			MINPT-O-EOU	
	4137.29	304.43	3933.85	20.47	OSF1.50	22110.00	12520.00			MinPt-O-ADP	
	4143.98	319.82	3930.28	19.52	OSF1.50	22554.23	12520.00			MinPis	

Cimarex Vaca Draw 20-17

Federal #6H MWD

Final(Surcon Corrected) (Def

Survey)

Pass

3778.44	32.81	3775.92	3745.63	176014.12	MAS = 10.00 (m)	0.00	0.00	Surface	
3778.39	32.81	3775.80	3745.58	43522.75	MAS = 10.00 (m)	23.00	23.00	WRP	
3775.11	32.81	3769.67	3742.30	1282.63	MAS = 10.00 (m)	690.00	690.00	MinPis	
3775.71	32.81	3769.37	3742.90	984.04	MAS = 10.00 (m)	900.00	900.00	MINPT-O-EOU	
3778.13	32.81	3769.96	3745.32	665.41	MAS = 10.00 (m)	1310.00	1310.00	MINPT-O-EOU	
3758.57	32.81	3744.60	3725.76	327.92	MAS = 10.00 (m)	2580.00	2579.99	MinPis	
3758.64	32.81	3744.66	3725.83	327.42	MAS = 10.00 (m)	2600.00	2599.98	MinPt-O-SF	
3780.75	32.81	3767.15	3747.94	340.25	MAS = 10.00 (m)	2900.00	2898.70	MinPis	

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	
3823.80	32.81	3810.08	3790.99	340.63	MAS = 10.00 (m)	3200.00	3195.78			MinPt-O-SF	
3887.71	32.81	3873.87	3854.90	342.58	MAS = 10.00 (m)	3640.00	3631.50			MinPt-O-SF	
4314.83	32.81	4283.06	4282.02	223.74	MAS = 10.00 (m)	8500.00	8463.74			MinPt-O-SF	
4342.00	32.81	4320.77	4309.19	231.70	MAS = 10.00 (m)	7140.00	7102.91			MinPts	
4342.03	32.81	4320.72	4309.22	230.68	MAS = 10.00 (m)	7200.00	7162.91			MINPT-O-EOU	
4728.77	42.84	4699.38	4685.93	175.76	OSF1.50	10660.00	10622.91			MinPt-O-SF	
5403.56	48.72	5370.25	5354.84	175.30	OSF1.50	12100.00	12062.80			MinPt-CtCt	
5612.21	52.08	5576.66	5560.13	169.73	OSF1.50	13150.00	12520.00			MINPT-O-EOU	
5612.31	52.37	5576.56	5559.93	168.73	OSF1.50	13190.00	12520.00			MinPt-O-EOU	
5612.44	52.53	5576.59	5559.91	168.21	OSF1.50	13210.00	12520.00			MinPt-O-ADP	
5623.96	57.23	5584.97	5566.73	154.07	OSF1.50	13580.00	12520.00			MinPts	
5626.94	61.37	5585.19	5565.57	143.32	OSF1.50	13720.00	12520.00			MINPT-O-EOU	
5614.39	73.06	5564.85	5541.33	119.30	OSF1.50	14240.00	12520.00			MinPt-CtCt	
5614.69	74.03	5564.50	5540.66	117.68	OSF1.50	14310.00	12520.00			MINPT-O-EOU	
5615.16	74.60	5564.59	5540.55	116.76	OSF1.50	14350.00	12520.00			MinPt-O-ADP	
5593.74	101.62	5525.16	5492.12	84.61	OSF1.50	15360.00	12520.00			MinPt-CtCt	
5594.08	102.67	5524.80	5491.41	83.73	OSF1.50	15430.00	12520.00			MINPT-O-EOU	
5594.45	103.12	5524.87	5491.33	83.36	OSF1.50	15460.00	12520.00			MinPt-O-ADP	
5613.76	116.46	5535.29	5497.31	73.86	OSF1.50	15900.00	12520.00			MinPt-CtCt	
5613.42	126.52	5528.24	5486.90	67.86	OSF1.50	16260.00	12520.00			MinPt-CtCt	
5612.31	145.95	5514.17	5466.36	58.66	OSF1.50	16940.00	12520.00			MinPt-CtCt	
5613.09	148.30	5513.36	5464.79	57.72	OSF1.50	17060.00	12520.00			MINPT-O-EOU	
5614.07	149.47	5513.59	5464.60	57.27	OSF1.50	17120.00	12520.00			MinPt-O-ADP	
5615.96	159.20	5508.99	5466.75	53.73	OSF1.50	17400.00	12520.00			MinPt-CtCt	
5613.56	176.67	5494.94	5436.88	48.32	OSF1.50	18000.00	12520.00			MinPt-CtCt	
5613.45	185.99	5488.62	5427.46	45.87	OSF1.50	18320.00	12520.00			MinPt-CtCt	
5613.38	191.25	5485.05	5422.13	44.59	OSF1.50	18500.00	12520.00			MinPt-CtCt	
5606.37	232.32	5450.66	5374.05	36.58	OSF1.50	19890.00	12520.00			MinPt-CtCt	
5607.22	234.96	5449.75	5372.26	36.17	OSF1.50	20020.00	12520.00			MINPT-O-EOU	
5605.90	304.88	5401.82	5301.03	27.80	OSF1.50	22320.00	12520.00			MinPt-CtCt	
5606.18	305.72	5401.53	5300.46	27.72	OSF1.50	22380.00	12520.00			MINPT-O-EOU	
5606.41	305.99	5401.58	5300.42	27.70	OSF1.50	22400.00	12520.00			MinPt-O-ADP	
5610.61	307.98	5404.46	5302.63	27.54	OSF1.50	22554.23	12520.00			MinPt-O-SF	

Cinmarex Vaca Draw 20-17

Federal #5H Final

MWD/Surcon Corrected) (Def

Survey)

Pass

3798.45	32.81	3795.94	3765.64	277681.18	MAS = 10.00 (m)	0.00	0.00			Surface	
3798.42	32.81	3795.85	3765.61	52358.11	MAS = 10.00 (m)	23.00	23.00			WRP	
3796.48	32.81	3791.82	3763.67	1757.34	MAS = 10.00 (m)	5300.00	5300.00			MinPts	
3796.57	32.81	3791.08	3763.77	1268.16	MAS = 10.00 (m)	7300.00	7300.00			MinPts	
3796.86	32.81	3790.70	3764.05	1036.67	MAS = 10.00 (m)	870.00	870.00			MINPT-O-EOU	
3798.60	32.81	3788.98	3765.79	532.76	MAS = 10.00 (m)	1640.00	1640.00			MinPts	
3798.69	32.81	3788.85	3765.86	517.11	MAS = 10.00 (m)	1690.00	1690.00			MINPT-O-EOU	
3816.91	32.81	3803.33	3784.10	344.10	MAS = 10.00 (m)	2600.00	2599.98			MinPt-O-SF	
3848.37	32.81	3835.07	3815.56	356.01	MAS = 10.00 (m)	2900.00	2898.70			MinPts	
3885.05	32.81	3871.82	3852.25	361.55	MAS = 10.00 (m)	3140.00	3136.37			MinPt-O-SF	
4398.90	32.81	4377.26	4366.10	229.63	MAS = 10.00 (m)	6444.82	6409.03			MinPt-CtCt	
4442.98	34.83	4418.90	4408.13	206.03	OSF1.50	8370.00	8332.91			MINPT-O-EOU	
4443.26	35.68	4418.64	4407.58	200.78	OSF1.50	8580.00	8542.91			MinPt-O-EOU	
4443.51	35.96	4418.70	4407.55	199.06	OSF1.50	8650.00	8612.91			MinPt-O-ADP	
4450.78	39.42	4423.67	4411.36	180.72	OSF1.50	9420.00	9382.91			MinPt-O-ADP	
4742.74	46.34	4711.01	4696.40	162.19	OSF1.50	11220.00	11182.91			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		
4958.04	49.12	4924.46	4908.92	159.43	OSF1.50	11800.00	11762.91	MinPt-O-SF				
4989.11	49.91	4955.00	4939.20	157.78				MinPt-O-SF				
5233.96	55.90	5195.86	5178.06	146.96				MinPt-CtCt				
5234.18	56.51	5195.67	5177.67	145.30	OSF1.50	13300.00	12520.00	MINPT-O-EOU				
5234.53	56.95	5195.73	5177.59	144.14	OSF1.50	13340.00	12520.00	MinPt-O-ADP				
5225.97	66.74	5180.64	5159.23	121.96	OSF1.50	13860.00	12520.00	MinPt-CtCt				
5226.26	67.65	5180.33	5158.62	120.28	OSF1.50	13930.00	12520.00	MINPT-O-EOU				
5226.87	68.35	5180.48	5158.53	119.01	OSF1.50	13980.00	12520.00	MinPt-O-ADP				
5223.79	85.95	5165.65	5137.83	93.85	OSF1.50	14690.00	12520.00	MinPt-CtCt				
5225.02	89.76	5164.35	5135.26	89.77	OSF1.50	14880.00	12520.00	MINPT-O-EOU				
5226.72	91.82	5164.67	5134.90	87.73	OSF1.50	14980.00	12520.00	MinPt-O-ADP				
5216.41	110.32	5142.03	5106.09	72.54	OSF1.50	15620.00	12520.00	MinPt-CtCt				
5216.89	111.68	5141.60	5105.21	71.64	OSF1.50	15700.00	12520.00	MINPT-O-EOU				
5217.46	112.37	5141.72	5105.09	71.20	OSF1.50	15740.00	12520.00	MinPt-O-ADP				
5223.95	127.63	5138.03	5096.32	62.59	OSF1.50	16280.00	12520.00	MINPT-O-EOU				
5225.39	129.34	5138.33	5096.05	61.76	OSF1.50	16360.00	12520.00	MinPt-O-ADP				
5228.31	132.84	5138.92	5095.47	60.14	OSF1.50	16480.00	12520.00	MINPT-O-EOU				
5218.17	153.49	5115.01	5064.68	51.81	OSF1.50	17150.00	12520.00	MinPt-CtCt				
5218.57	159.59	5111.35	5058.99	49.81	OSF1.50	17360.00	12520.00	MinPt-CtCt				
5211.17	196.12	5079.59	5015.05	40.35	OSF1.50	18610.00	12520.00	MinPt-CtCt				
5215.86	211.11	5074.29	5004.75	37.49	OSF1.50	19160.00	12520.00	MINPT-O-EOU				
5220.57	219.84	5073.17	5000.72	36.01	OSF1.50	19460.00	12520.00	MINPT-O-EOU				
5222.99	225.49	5071.83	4997.50	35.12	OSF1.50	19650.00	12520.00	MINPT-O-EOU				
5226.42	232.73	5070.44	4993.69	34.03	OSF1.50	19900.00	12520.00	MINPT-O-EOU				
5218.01	272.32	5035.63	4945.69	28.99	OSF1.50	21180.00	12520.00	MinPt-CtCt				
5220.89	279.21	5033.91	4941.67	28.29	OSF1.50	21460.00	12520.00	MINPT-O-EOU				
5230.24	290.93	5035.45	4939.31	27.19	OSF1.50	21870.00	12520.00	MinPt-O-ADP				
5224.48	306.36	5019.41	4918.12	25.78	OSF1.50	22320.00	12520.00	MinPt-CtCt				
5224.69	307.07	5019.14	4917.62	25.72	OSF1.50	22370.00	12520.00	MINPT-O-EOU				
5224.91	307.35	5019.17	4917.56	25.70	OSF1.50	22390.00	12520.00	MinPt-O-ADP				
5229.58	309.45	5022.44	4920.12	25.54	OSF1.50	22554.23	12520.00	MinPt-O-SF				
Cimarex Vaca Draw 20-17												
Federal #1H ST01 0ft-2 1966ft												
(Def Survey)												
3818.41	32.81	3816.72	3785.60	107951.71	MAS = 10.00 (m)	0.00	0.00	Surface				Pass
3818.31	32.81	3816.55	3785.50	34823.57	MAS = 10.00 (m)	23.00	23.00	WRP				
3816.42	32.81	3813.58	3783.61	3206.81	MAS = 10.00 (m)	290.00	290.00	MinPis				
3816.89	32.81	3813.20	3784.08	1876.39	MAS = 10.00 (m)	450.00	450.00	MINPT-O-EOU				
3866.19	32.81	3853.47	3833.38	349.12	MAS = 10.00 (m)	2600.00	2599.98	MinPt-O-SF				
3898.57	32.81	3886.11	3865.76	360.62	MAS = 10.00 (m)	2900.00	2898.70	MinPis				
3970.14	32.81	3957.70	3937.33	367.79	MAS = 10.00 (m)	3330.00	3324.52	MinPt-O-SF				
4511.78	32.81	4490.76	4478.97	232.88	MAS = 10.00 (m)	6444.82	6409.03	MinPt-O-SF				
4521.04	32.81	4499.98	4488.23	232.88	MAS = 10.00 (m)	6500.00	6463.74	MinPt-O-SF				
4557.40	32.81	4537.15	4524.60	244.94	MAS = 10.00 (m)	6890.00	6852.91	MinPt-O-SF				
4593.49	35.21	4569.47	4558.28	205.22	OSF1.50	8370.00	8332.91	MINPT-O-EOU				
4593.96	35.82	4569.53	4558.14	201.58	OSF1.50	8520.00	8482.91	MinPt-O-ADP				
4598.67	39.96	4571.48	4558.71	180.00	OSF1.50	9550.00	9512.91	MinPt-CtCt				
4567.49	52.10	4532.20	4515.38	135.75	OSF1.50	11830.00	11792.91	MinPt-CtCt				
4567.57	52.32	4532.14	4515.25	135.17	OSF1.50	11870.00	11832.91	MINPT-O-EOU				
4567.66	52.42	4532.16	4515.24	134.90	OSF1.50	11890.00	11852.91	MinPt-O-ADP				
4561.26	59.41	4521.10	4501.85	118.42	OSF1.50	12980.00	12518.43	MinPt-CtCt				
4561.23	60.67	4520.23	4500.55	115.87	OSF1.50	13080.00	12520.00	MinPt-CtCt				
4561.40	61.21	4520.04	4500.18	114.83	OSF1.50	13130.00	12520.00	MINPT-O-EOU				

Cimarex Vaca Draw 20-17
Federal #1H ST01 0ft-2 1966ft
(Def Survey)

Pass

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	
4561.66	61.54	4520.08	4500.12	114.21	OSF1.50	13160.00	12520.00				MinPt-O-ADP
4554.36	73.72	4504.66	4480.64	94.76	OSF1.50	13830.00	12520.00				MinPt-CtCt
4554.70	74.73	4504.33	4479.97	93.45	OSF1.50	13900.00	12520.00				MINPT-O-EOU
4555.07	75.18	4504.40	4479.89	92.90	OSF1.50	13930.00	12520.00				MinPt-O-ADP
4563.11	84.99	4505.90	4478.12	82.10	OSF1.50	14350.00	12520.00				MinPt-CtCt
4557.26	99.57	4490.33	4457.69	69.78	OSF1.50	14950.00	12520.00				MinPt-CtCt
4558.03	101.95	4489.52	4456.08	68.14	OSF1.50	15070.00	12520.00				MINPT-O-EOU
4559.03	103.14	4489.72	4455.89	67.36	OSF1.50	15130.00	12520.00				MinPt-O-ADP
4537.63	141.10	4443.01	4396.53	48.79	OSF1.50	16500.00	12520.00				MinPt-CtCt
4538.41	143.41	4442.25	4394.99	48.00	OSF1.50	16610.00	12520.00				MINPT-O-EOU
4540.32	147.90	4441.16	4392.41	46.55	OSF1.50	16770.00	12520.00				MINPT-O-EOU
4541.61	149.44	4441.43	4392.17	46.08	OSF1.50	16840.00	12520.00				MinPt-O-ADP
4544.21	152.55	4441.96	4391.67	45.16	OSF1.50	16950.00	12520.00				MinPt-O-ADP
4555.63	161.11	4447.67	4394.51	42.84	OSF1.50	17260.00	12520.00				MINPT-O-EOU
4556.24	169.16	4442.91	4387.08	40.78	OSF1.50	17480.00	12520.00				MinPt-CtCt
4559.13	176.85	4440.68	4382.29	39.02	OSF1.50	17780.00	12520.00				MINPT-O-EOU
4580.69	178.67	4441.02	4382.02	38.63	OSF1.50	17860.00	12520.00				MinPt-O-ADP
4541.82	211.81	4400.06	4330.01	32.41	OSF1.50	18950.00	12520.00				MinPt-CtCt
4542.34	213.39	4399.53	4328.95	32.17	OSF1.50	19030.00	12520.00				MINPT-O-EOU
4542.97	214.18	4399.64	4328.80	32.05	OSF1.50	19070.00	12520.00				MinPt-O-ADP
4549.91	232.07	4409.64	4332.83	29.71	OSF1.50	19630.00	12520.00				MinPt-CtCt
4528.07	258.68	4355.07	4269.40	26.42	OSF1.50	20530.00	12520.00				MinPt-CtCt
4529.15	261.78	4354.08	4267.37	26.11	OSF1.50	20670.00	12520.00				MINPT-O-EOU
4530.73	263.59	4354.45	4267.14	25.94	OSF1.50	20750.00	12520.00				MINPT-O-EOU
4548.39	278.05	4362.48	4270.34	24.68	OSF1.50	21240.00	12520.00				MinPt-O-ADP
4551.17	288.74	4358.12	4262.42	23.77	OSF1.50	21540.00	12520.00				MinPt-CtCt
4553.40	295.99	4355.53	4257.42	23.20	OSF1.50	21820.00	12520.00				MINPT-O-EOU
4555.83	299.73	4355.46	4256.10	22.92	OSF1.50	21950.00	12520.00				MINPT-O-EOU
4556.22	300.17	4355.96	4256.05	22.89	OSF1.50	21970.00	12520.00				MinPt-O-ADP
4558.36	312.13	4349.72	4246.23	22.01	OSF1.50	22320.00	12520.00				MinPt-CtCt
4558.61	312.91	4349.45	4245.70	21.96	OSF1.50	22370.00	12520.00				MINPT-O-EOU
4558.86	313.21	4349.50	4245.65	21.94	OSF1.50	22390.00	12520.00				MinPt-O-ADP
4564.24	315.46	4353.38	4248.78	21.81	OSF1.50	22554.23	12520.00				MinPt-O-SF

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

Pass

3818.41	32.81	3815.87	3785.60	107928.47	MAS = 10.00 (m)	0.00	0.00				Surface
3818.31	32.81	3815.70	3785.50	34816.08	MAS = 10.00 (m)	23.00	23.00				WRP
3816.42	32.81	3812.73	3783.61	3206.10	MAS = 10.00 (m)	290.00	290.00				MinPts
3816.89	32.81	3812.35	3784.08	1875.98	MAS = 10.00 (m)	450.00	450.00				MINPT-O-EOU
3866.19	32.81	3852.62	3833.38	349.04	MAS = 10.00 (m)	2600.00	2599.98				MinPt-O-SF
3898.57	32.81	3885.26	3865.76	360.54	MAS = 10.00 (m)	2900.00	2898.70				MinPts
3970.14	32.81	3956.85	3937.33	367.71	MAS = 10.00 (m)	3330.00	3324.52				MinPt-O-SF
4511.78	32.81	4489.91	4478.97	232.84	MAS = 10.00 (m)	6444.82	6409.03				MinPt-O-SF
4521.04	32.81	4499.13	4488.23	232.84	MAS = 10.00 (m)	6500.00	6463.74				MinPt-O-SF
4557.40	32.81	4536.30	4524.60	244.89	MAS = 10.00 (m)	6890.00	6852.91				MinPt-O-SF
4593.49	36.06	4568.62	4557.43	205.18	OSF1.50	8370.00	8332.91				MINPT-O-EOU
4593.96	36.67	4568.68	4557.29	201.54	OSF1.50	8520.00	8482.91				MinPt-O-ADP
4598.67	40.81	4570.63	4557.86	179.96	OSF1.50	9550.00	9512.91				MinPt-CtCt
4561.79	56.01	4523.62	4505.78	127.82	OSF1.50	12420.00	12346.13				MinPt-CtCt
4561.82	56.10	4523.59	4505.72	127.59	OSF1.50	12440.00	12360.04				MINPT-O-EOU
4561.86	56.15	4523.60	4505.71	127.48	OSF1.50	12450.00	12366.76				MinPt-O-ADP
4597.68	82.92	5441.57	5414.76	102.50	OSF1.50	15530.00	12520.00				MinPt-O-SF

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		

TD

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

Pass

3818.46	32.81	3815.95	3785.65	N/A	MAS = 10.00 (m)	0.00	0.00			Surface	
3818.46	32.81	3815.90	3785.65	69533.70	MAS = 10.00 (m)	23.00	23.00			WRP	
3818.46	32.81	3800.55	3785.65	247.63	MAS = 10.00 (m)	2500.00	2500.00			MinPls	
3818.47	32.81	3800.52	3785.66	246.94	MAS = 10.00 (m)	2510.00	2510.00			MINPT-O-EOU	
3845.12	32.81	3825.96	3812.31	230.72	MAS = 10.00 (m)	2900.00	2898.70			MINPT-O-EOU	
4343.32	100.21	4275.68	4243.11	66.64	OSF1.50	12450.00	12366.76			MinPt-CtCt	
4343.37	100.40	4275.60	4242.97	66.51	OSF1.50	12480.00	12385.98			MINPT-O-EOU	
4343.41	100.46	4275.61	4242.95	66.47	OSF1.50	12490.00	12392.06			MinPt-O-ADP	
4474.51	105.75	4403.18	4368.77	64.97	OSF1.50	13560.00	12520.00			MinPt-O-SF	
4489.31	106.08	4417.76	4383.23	64.97	OSF1.50	13620.00	12520.00			MinPt-O-SF	
10966.57	133.10	10877.00	10833.47	125.93	OSF1.50	22554.23	12520.00			TD	



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 lockring |
| 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 |

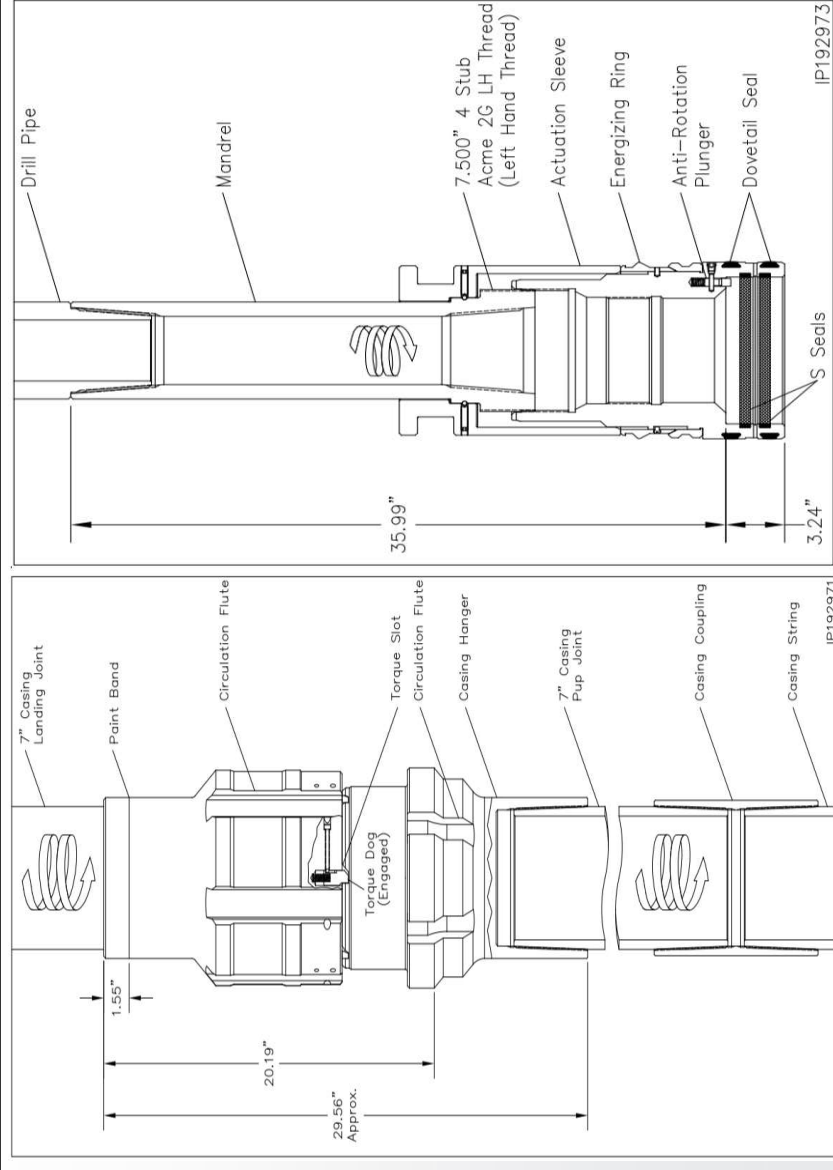


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SLIDE TITLE HERE | 2

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

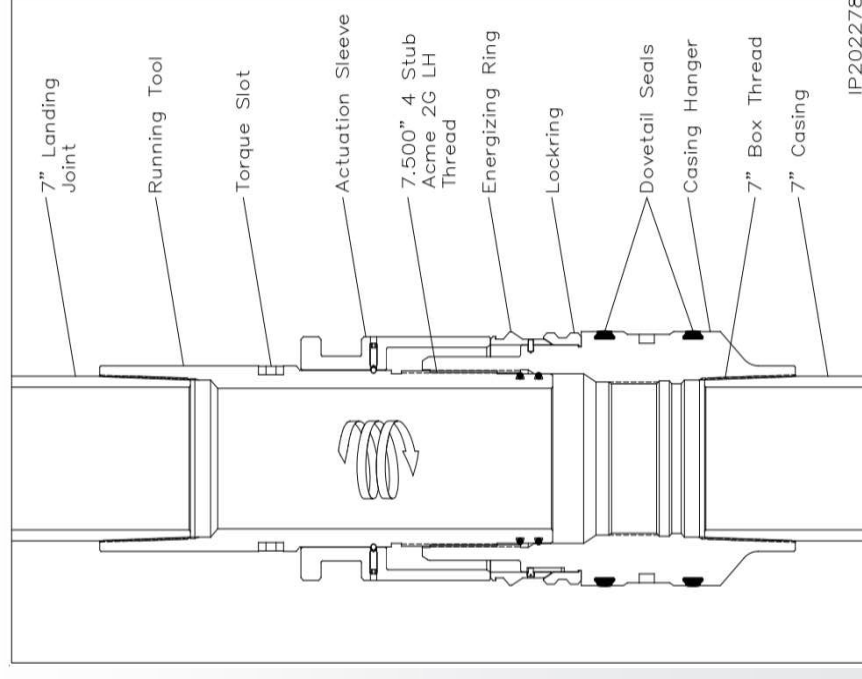


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Offline Cementing Equipment-Solid Body Mandrel Hanger

- 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



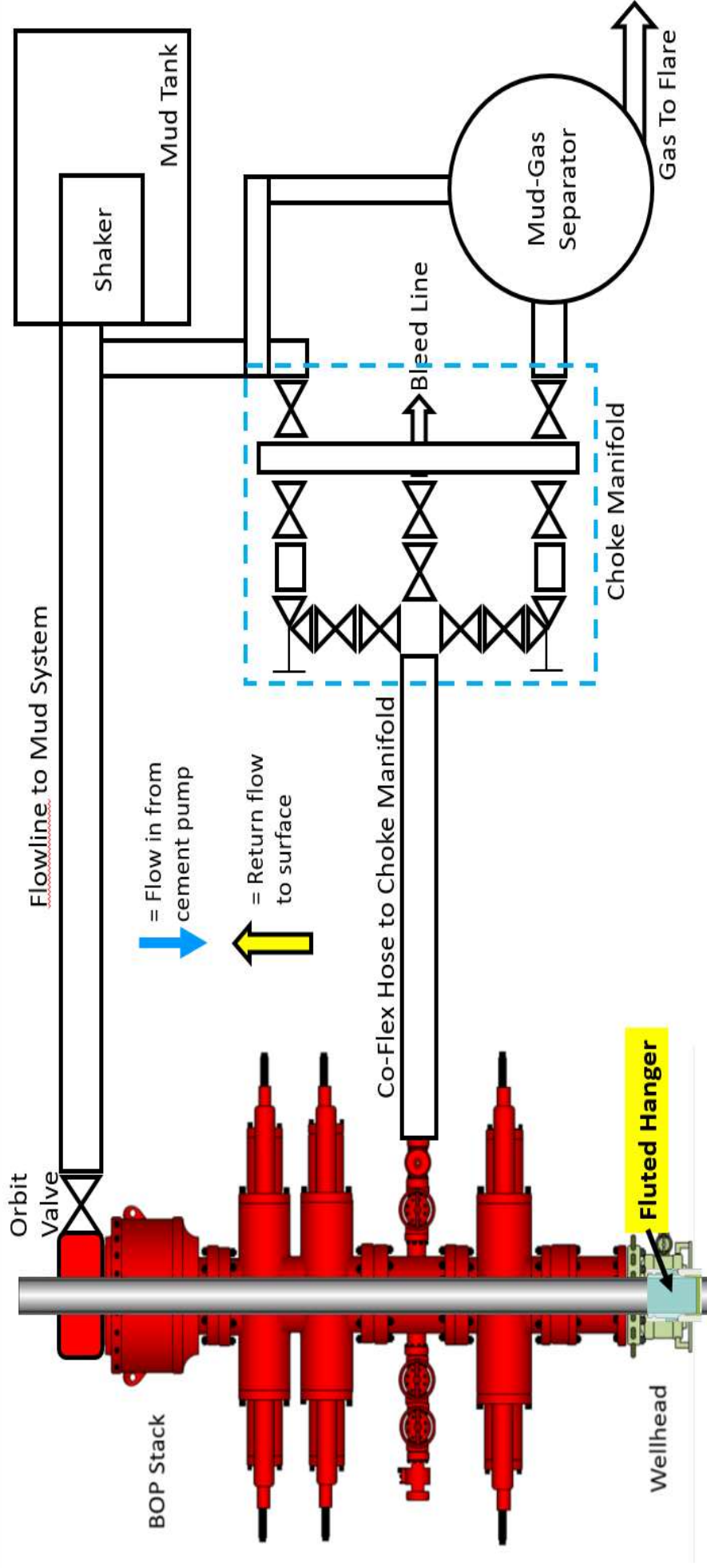
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Conventional Cementing Flow Diagram

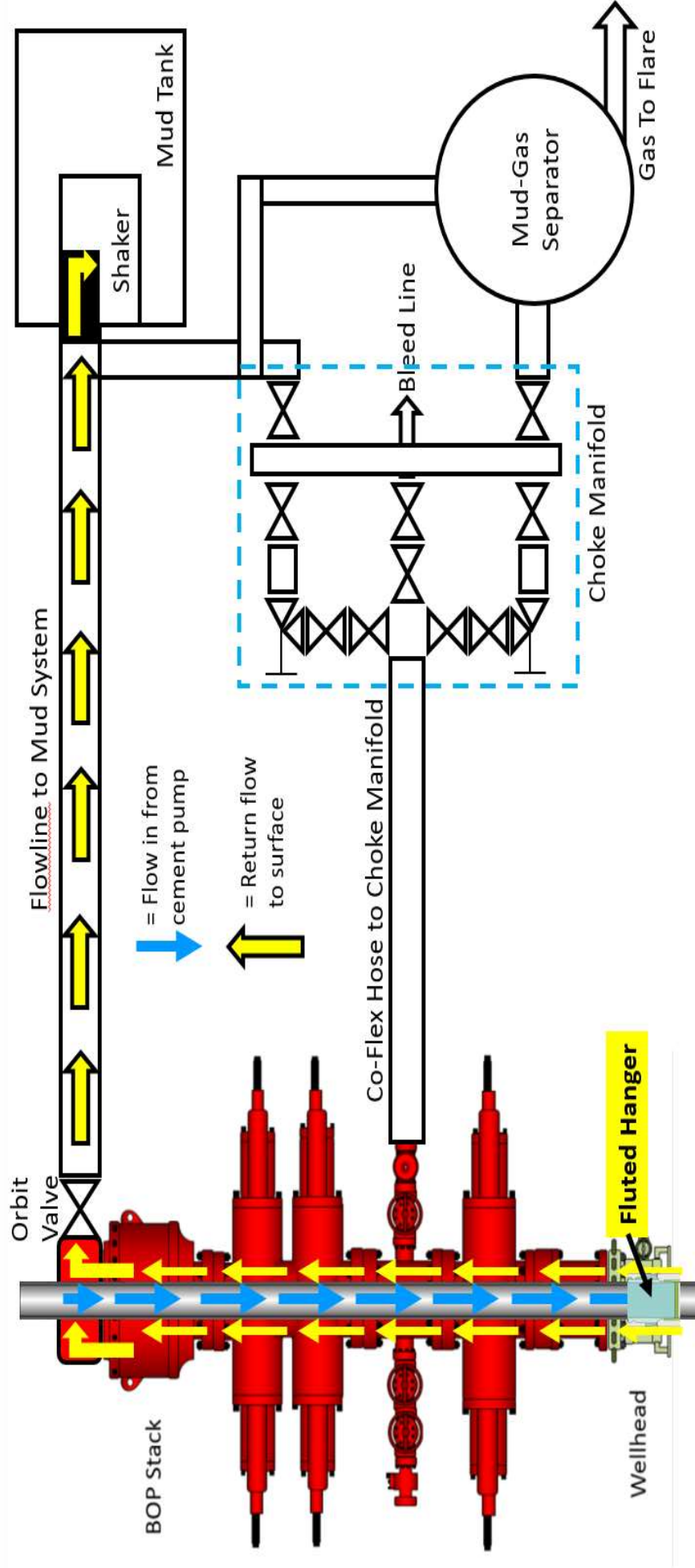


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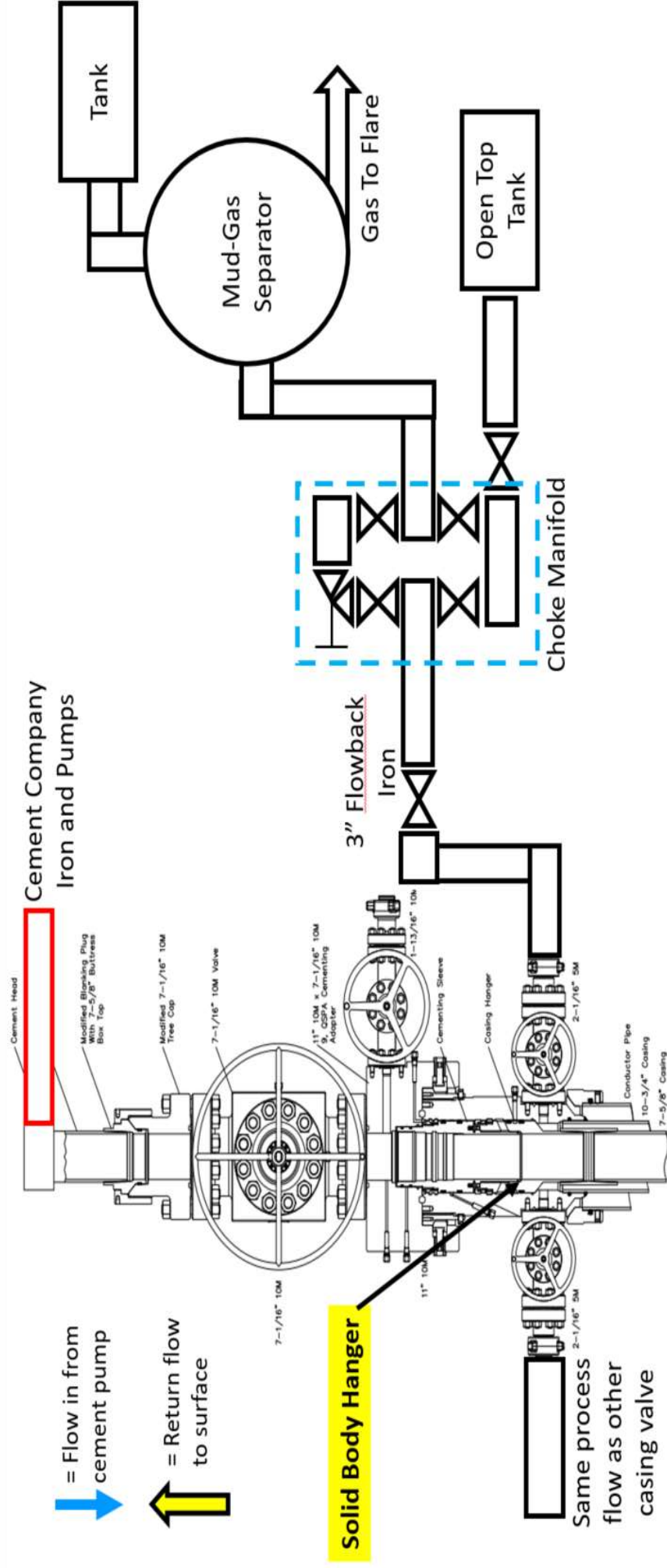
Conventional Cementing Flow Diagram



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Offline Cementing Flow Diagram



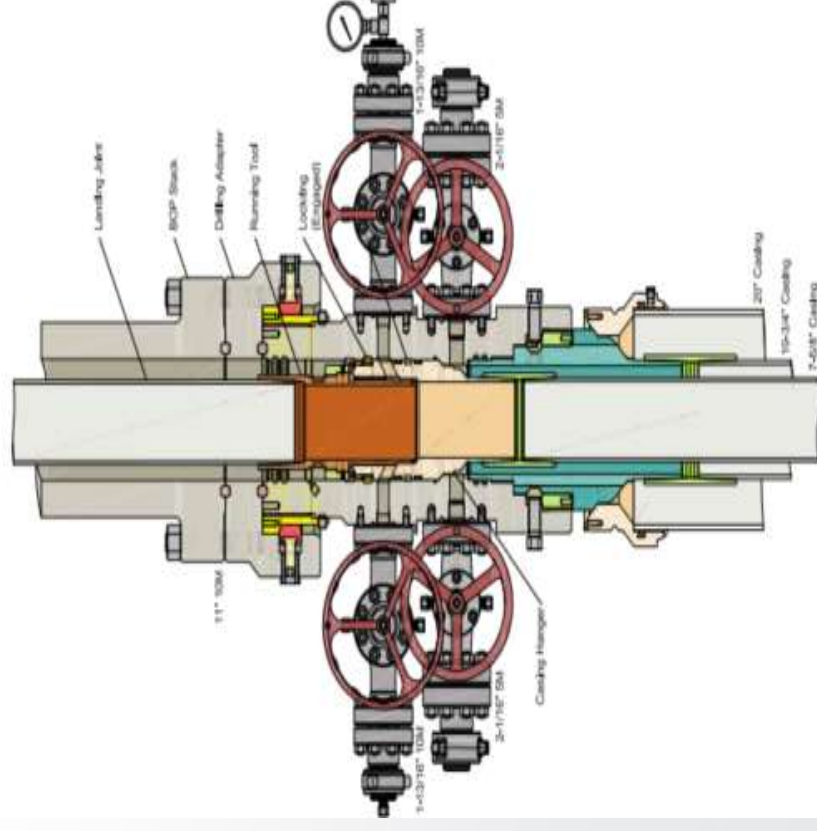
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SLIDE TITLE HERE | 7

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**

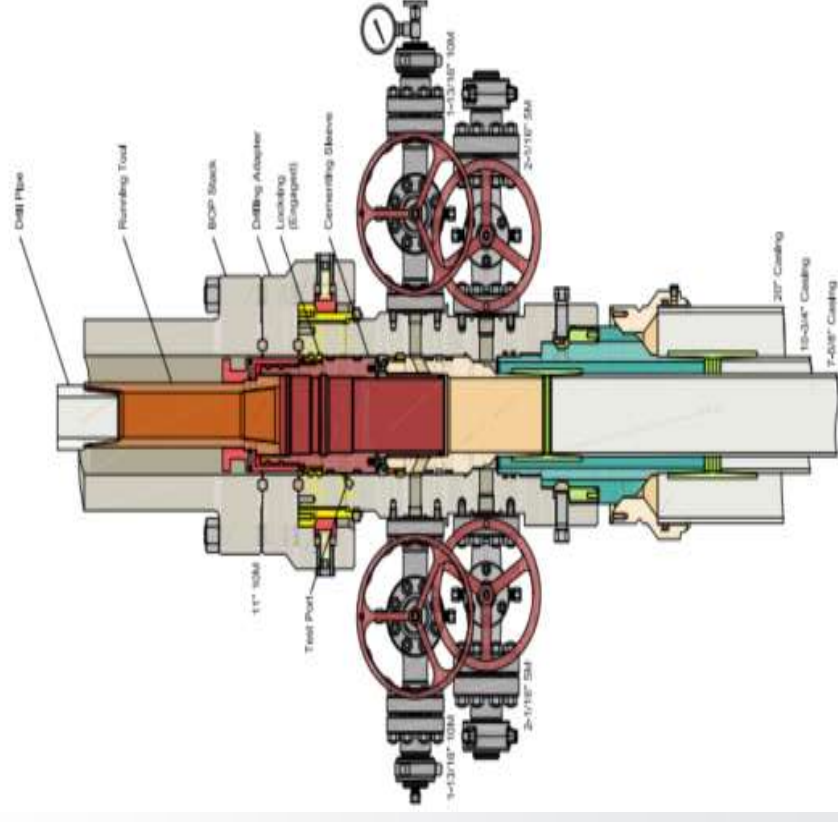


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Offline Cementing Progression

- 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

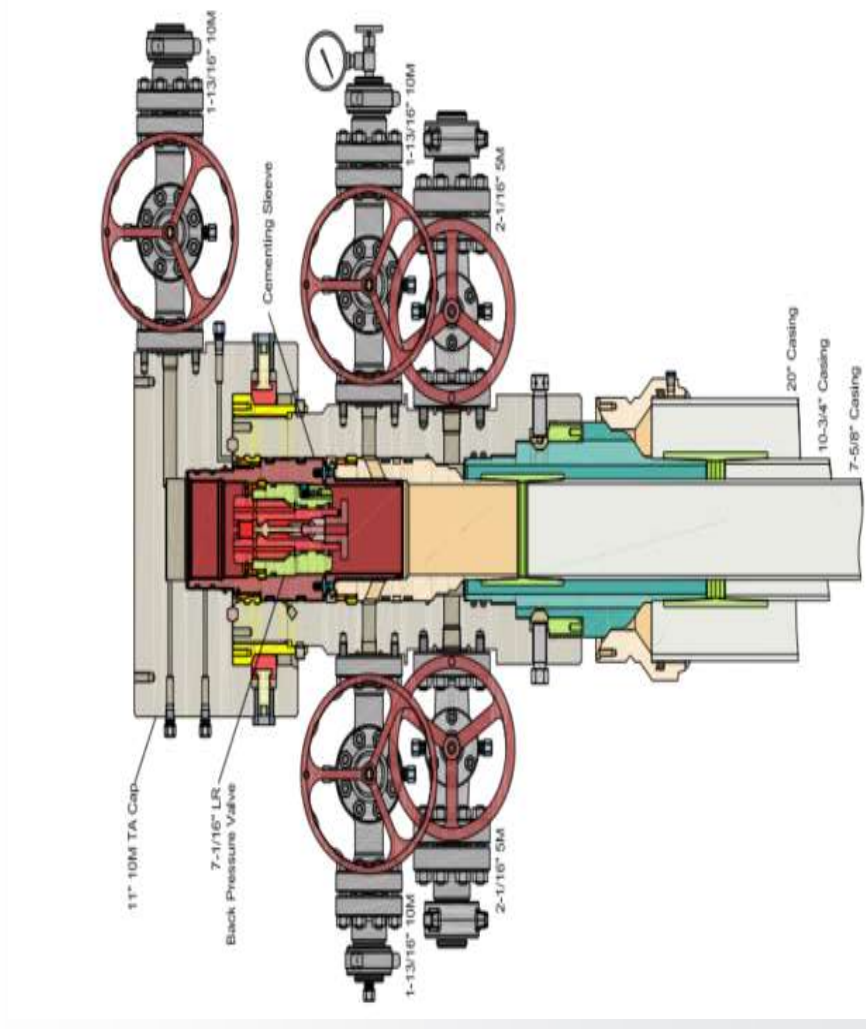


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Offline Cementing Progression

- 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

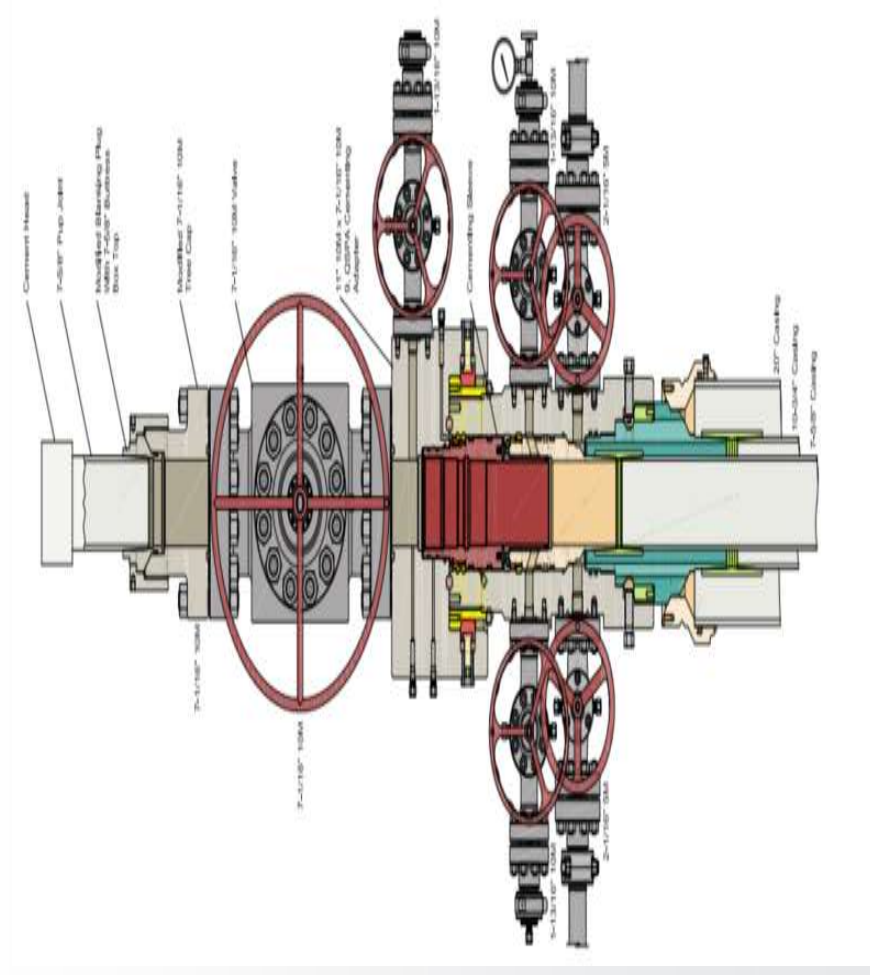


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Offline Cementing Progression

- 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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SLIDE TITLE HERE | 13

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District IV

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

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

CONDITIONS

Action 20503

CONDITIONS OF APPROVAL

Operator:	OGRID:	Action Number:	Action Type:
CIMAREX ENERGY CO. 600 N. Marienfeld Street Suite 600 Midland, TX79701	215099	20503	C-103A

OCD Reviewer	Condition
pkautz	None