

U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Well Name: CASSIUS FED COM 1510	Well Location: T23S / R29E / SEC 22 / NENE / 32.2957214 / -103.9682422	County or Parish/State: EDDY / NM
Well Number: 114H	Type of Well: OIL WELL	Allottee or Tribe Name:
Lease Number: NMNM111416	Unit or CA Name:	Unit or CA Number:
US Well Number: 3001549240	Operator: NOVO OIL AND GAS NORTHERN DELAWARE LLC	

Notice of Intent

Sundry ID: 2794799

Type of Submission: Notice of Intent

Type of Action: APD Change

Date Sundry Submitted: 06/11/2024

Time Sundry Submitted: 02:59

Date proposed operation will begin: 06/11/2024

Procedure Description: NOVO OIL AND GAS NORTHERN DELAWARE LLC Respectfully requests permission to make the following changes to the original APD Cassius Federal Com 1510 114H API# 30-015-49240: No Additional Surface Disturbance Changes: Name Change, SHL, FTP, PPP1, PPP2, PPP3, LTP, BHL: Name Change: From Cassius Federal Com 1510 114H To: Cassius Fed Com 114H SHL From: 764' FNL, 1302' FEL of Sec. 22-T23S-R29E TO: 765' FNL, 1362' FEL, Sec 22-T-23S-R29E FTP From: 100' FSL, 330' FEL of Sec. 22-T23S-R29E TO: 100' FNL, 340' FEL, Sec 22-T-23S-R29E LTP From: 100' FNL, 330' FEL of Sec. 10-T23S-R29E TO: 100' FNL, 340' FEL, Sec 10-T-23S-R29E BHL From: 10' FNL, 330' FEL of Sec. 10-T23S-R29E TO: 100' FNL, 340' FEL, Sec 10-T-23S-R29E Casing/Cement design per the attached drilling program. Permian Resources also requests the following variances: BOP Break Batch/Spud OLCV Attachments: C102 Layout Drilling Program Directional Plan Multibowl Diagram 5MBOP/5MCM BOP Break Test Procedure Batch/Spud OLCV

NOI Attachments

Procedure Description

CASSIUS_FED_COM_114H_Sundry_Attachments_20240612073222.pdf

Well Name: CASSIUS FED COM 1510

Well Location: T23S / R29E / SEC 22 / NENE / 32.2957214 / -103.9682422

County or Parish/State: EDDY / NM

Well Number: 114H

Type of Well: OIL WELL

Allottee or Tribe Name:

Lease Number: NMNM111416

Unit or CA Name:

Unit or CA Number:

US Well Number: 3001549240

Operator: NOVO OIL AND GAS NORTHERN DELAWARE LLC

Operator

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

Operator Electronic Signature: CASSIE EVANS

Signed on: JUN 12, 2024 07:32 AM

Name: NOVO OIL AND GAS NORTHERN DELAWARE LLC

Title: Regulatory Specialist

Street Address: 300 N MARIENFELD ST STE 1000

City: MIDLAND

State: TX

Phone: (432) 260-4388

Email address: CASSIE.EVANS@PERMIANRES.COM

Field

Representative Name:

Street Address:

City:

State:

Zip:

Phone:

Email address:

BLM Point of Contact

BLM POC Name: ALLISON MORENCY

BLM POC Title: Contractor WO

BLM POC Phone: 2029127157

BLM POC Email Address: amorency@blm.gov

Disposition: Approved

Disposition Date: 06/13/2024

Signature: AM

Form 3160-5
(June 2019)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

5. Lease Serial No. **NMNM111416**

6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well
 Oil Well Gas Well Other

2. Name of Operator **NOVO OIL AND GAS NORTHERN DELAWARE LLC**

3a. Address **300 N MARIENFIELD STREET SUITE 1000, MID** 3b. Phone No. (include area code) **(432) 695-4222**

4. Location of Well (Footage, Sec., T.,R.,M., or Survey Description)
SEC 22/T23S/R29E/NMP

7. If Unit of CA/Agreement, Name and/or No.

8. Well Name and No. **CASSIUS FED COM 1510/114H**

9. API Well No. **3001549240**

10. Field and Pool or Exploratory Area
LAGUNA SALADO/BONE SPRING

11. Country or Parish, State
EDDY/NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input type="checkbox"/> Other
	<input checked="" type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recomplate horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has detennined that the site is ready for final inspection.)

NOVO OIL AND GAS NORTHERN DELAWARE LLC Respectfully requests permission to make the following changes to the original APD Cassius Federal Com 1510 114H API# 30-015-49240:

No Additional Surface Disturbance

Changes: Name Change, SHL, FTP, PPP1, PPP2, PPP3, LTP, BHL:

Name Change:

From Cassius Federal Com 1510 114H

To: Cassius Fed Com 114H

SHL From: 764 FNL, 1302 FEL of Sec. 22-T23S-R29E TO: 765 FNL, 1362 FEL, Sec 22-T-23S-R29E

FTP From: 100 FSL, 330 FEL of Sec. 22-T23S-R29E TO: 100 FNL, 340 FEL, Sec 22-T-23S-R29E

Continued on page 3 additional information

14. I hereby certify that the foregoing is true and correct. Name (Printed/Typed)
CASSIE EVANS / Ph: (432) 260-4388

Signature (Electronic Submission)

Title **Regulatory Specialist**

Date **06/12/2024**

THE SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by **ALLISON MORENCY / Ph: (202) 912-7157 / Approved**

Contractor WO Title **CARLSBAD** Date **06/13/2024**

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

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.

(Instructions on page 2)

GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations and reports of such operations when completed as indicated on Federal and Indian lands pursuant to applicable Federal law and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local area or regional procedures and practices, are either shown below, will be issued by or may be obtained from the local Federal office.

SPECIFIC INSTRUCTIONS

Item 4 - Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult the local Federal office for specific instructions.

Item 13: Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by the local Federal office. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to the top of any tubing left in the hole; method of closing top of well and date well site conditioned for final inspection looking for approval of the abandonment. If the proposal will involve **hydraulic fracturing operations**, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 351 et seq., 25 U.S.C. 396; 43 CFR 3160.

PRINCIPAL PURPOSE: The information is used to: (1) Evaluate, when appropriate, approve applications, and report completion of subsequent well operations, on a Federal or Indian lease; and (2) document for administrative use, information for the management, disposal and use of National Resource lands and resources, such as: (a) evaluating the equipment and procedures to be used during a proposed subsequent well operation and reviewing the completed well operations for compliance with the approved plan; (b) requesting and granting approval to perform those actions covered by 43 CFR 3162.3-2, 3162.3-3, and 3162.3-4; (c) reporting the beginning or resumption of production, as required by 43 CFR 3162.4-1(c) and (d) analyzing future applications to drill or modify operations in light of data obtained and methods used.

ROUTINE USES: Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions in connection with congressional inquiries or to consumer reporting agencies to facilitate collection of debts owed the Government.

EFFECT OF NOT PROVIDING THE INFORMATION: Filing of this notice and report and disclosure of the information is mandatory for those subsequent well operations specified in 43 CFR 3162.3-2, 3162.3-3, 3162.3-4.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM collects this information to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.

Response to this request is mandatory.

The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C St., N.W., Mail Stop 401 LS, Washington, D.C. 20240

Additional Information

Additional Remarks

LTP From: 100 FNL, 330 FEL of Sec. 10-T23S-R29E TO: 100 FNL, 340 FEL, Sec 10-T-23S-R29E

BHL From: 10 FNL, 330 FEL of Sec. 10-T23S-R29E TO: 100 FNL, 340 FEL, Sec 10-T-23S-R29E

Casing/Cement design per the attached drilling program.

Permian Resources also requests the following variances:

BOP Break

Batch/Spud

OLCV

Attachments:

C102

Layout

Drilling Program

Directional Plan

Multibowl Diagram

5MBOP/5MCM

BOP Break Test Procedure

Batch/Spud

OLCV

Location of Well

0. SHL: NENE / 764 FNL / 1302 FEL / TWSP: 23S / RANGE: 29E / SECTION: 22 / LAT: 32.2957214 / LONG: -103.9682422 (TVD: 0 feet, MD: 0 feet)

PPP: NENE / 412 FNL / 471 FEL / TWSP: 23S / RANGE: 29E / SECTION: 22 / LAT: 32.2966851 / LONG: -103.9655527 (TVD: 7325 feet, MD: 7405 feet)

BHL: NENE / 10 FNL / 330 FEL / TWSP: 23S / RANGE: 29E / SECTION: 10 / LAT: 32.3270068 / LONG: -103.9651598 (TVD: 7865 feet, MD: 18696 feet)

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazon Road, Artec, NM 87410
District IV
1220 S. St Francis Dr., NM 87505
Phone: (505) 476-3460 Fax (505) 476-3462

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

Form C-102

Revised August 1, 2011

Submit one copy to appropriate District Office

AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-015-49240		² Pool Code 96721		³ Pool Name Laguna Salado; Bone Spring	
⁴ Property Code		⁵ Property Name CASSIUS FED COM			⁶ Well Number 114H
⁷ OGRID No. 372920		⁸ Operator Name Novo Oil & Gas Northern Delaware, LLC			⁹ Elevation 3,000'

¹⁰ Surface Location

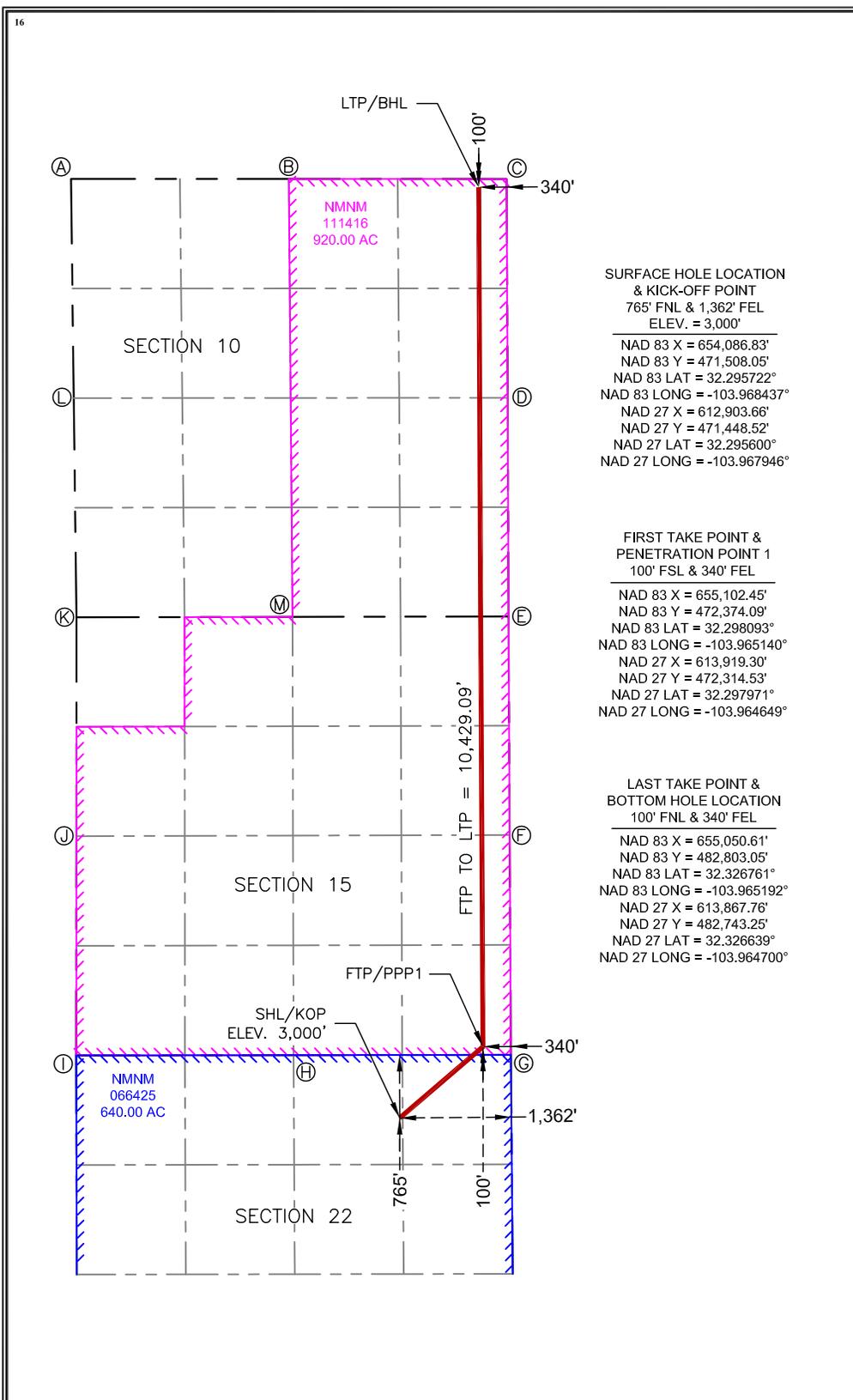
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	22	23 S	29 E		765'	NORTH	1,362'	EAST	EDDY

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
A	10	23 S	29 E		100'	NORTH	340'	EAST	EDDY

¹² Dedicated Acres 320	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



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.

Cassie Evans

6/10/2024

Signature	Date
Cassie Evans	
Printed Name	
Cassie.Evans@permanres.com	
Email Address	

CORNER COORDINATES NEW MEXICO EAST - NAD 83	
A	CALCULATED CORNER N:482,904.46' E:650,077.43'
B	IRON PIPE W/ BRASS CAP (RAN OVER) N:482,903.50' E:652,734.15'
C	IRON PIPE W/ BRASS CAP (RAN OVER) N:482,902.98' E:655,390.11'
D	IRON PIPE W/ BRASS CAP (RAN OVER) N:480,247.77' E:655,403.54'
E	IRON PIPE W/ BRASS CAP N:477,594.76' E:655,414.17'
F	IRON PIPE W/ BRASS CAP N:474,943.07' E:655,427.48'
G	IRON PIPE W/ BRASS CAP N:472,274.53' E:655,443.03'
H	IRON PIPE W/ BRASS CAP N:472,271.10' E:652,792.08'
I	CALCULATED CORNER N:472,267.13' E:650,140.84'
J	IRON PIPE W/ BRASS CAP (RAN OVER) N:474,927.95' E:650,143.86'
K	CALCULATED CORNER N:477,584.20' E:650,144.28'
L	CALCULATED CORNER N:480,244.34' E:650,110.86'
M	IRON PIPE W/ BRASS CAP (RAN OVER) N:477,588.80' E:652,779.28'

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.



Date: 6/3/2024

Permian Resources - Cassius Fed Com 114H

1. Geologic Formations

Formation	Elevation	TVD	Lithology	Target
Rustler	-2780	250	Sandstone	No
Top of Salt	-2466	564	Salt	No
Lamar	-580	2450	Anhydrite/Shale	No
Yates	NP	NP	Anhydrite/Shale	No
Seven Rivers	NP	NP	Limestone	No
Queen	NP	NP	Limestone	No
Grayburg	NP	NP	Limestone	No
San Andres	NP	NP	Limestone	No
Cherry Canyon	1045	4075	Sandstone	No
Brushy Canyon	2520	5550	Sandstone	No
Bone Spring Lime	3700	6730	Limestone/Shale	No
1st Bone Spring	4704	7734	Sandstone/Limestone/Shale	Yes
2nd Bone Spring	5550	8580	Sandstone/Limestone/Shale	No
3rd Bone Spring	6220	9250	Sandstone/Limestone/Shale	No
Wolfcamp	6950	9980	Shale	No

2. Blowout Prevention

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	x	Tested to:
12.25	13-5/8"	5M	Annular	x	2500 psi
			Blind Ram	x	5000 psi
			Pipe Ram	x	
			Double Ram		
			Other*		
8.75	13-5/8"	5M	Annular	x	2500 psi
			Blind Ram	x	5000 psi
			Pipe Ram	x	
			Double Ram		
			Other*		

Equipment: BOPE with working pressure ratings in excess of anticipated maximum surface pressure will be utilized for well control from drill out of surface casing to TMD. 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. All BOPE connections shall be flanged, welded or clamped. All choke lines shall be straight unless targeted with running tees or tee blocks are used, and choke lines shall be anchored to prevent whip and reduce vibrations. All valves in the choke line & the choke manifold shall be full opening as to not cause restrictions and to allow for straight fluid paths to minimize potential erosion. All gauges utilized in the well control system shall be of a type designed for drilling fluid service. A top drive inside BOP valve will be utilized at all times. Subs equipped with full opening valves sized to fit the drill pipe and collars will be available on the rig floor in the open position. The key to operate said valve equipped subs will be on the rig floor at all times. The accumulator system will have sufficient capacity to open the HCR and close all three sets of rams plus the annular preventer while retaining at least 300 psi above precharge on the closing manifold (accumulator system shall be capable of doing so without using the closing unit pumps). The fluid reservoir capacity will be double the usable fluid volume of the accumulator system capacity, and the fluid level will be maintained at the manufacturer's recommended level. Prior to connecting the closing unit to the BOP stack, an accumulator precharge pressure test shall be performed to ensure the precharge pressure is within 100 psi of the desired precharge pressure (only nitrogen gas will be used to precharge). Two independent power sources will be made available at all times to power the closing unit pumps so that the pumps can automatically start when the closing valve manifold pressure has decreased to the preset level. Closing unit pumps will be sized to allow opening of HCR and closing of annular preventer on 5" drill pipe achieving at least 200 psi above precharge pressure with the accumulator system isolated from service in less than two minutes. A valve shall be installed in the closing line as close to the annular preventer as possible to act as a locking device; the valve shall be maintained in the open position and shall be closed only when the power source for the accumulator system is inoperative. Remote controls capable of opening and closing all preventers & the HCR shall be readily accessible to the driller; master controls with the same capability will be operable at the accumulator. The wellhead will be a multibowl speed head allowing for hangoff of intermediate casing & isolation of the 133/8 x 95/8 annulus without breaking the connection between the BOP & wellhead to install an additional casing head. A wear bushing will be installed & inspected frequently to guard against internal wear to wellhead. VBRs (variablebore rams) will be run in upper rambody of BOP stack to provide redundancy to annular preventer while RIH w/ production casing;

Requesting Variance? YES

Variance request: Flex hose and offline cement variances, see attachments in section 8.

Testing Procedure: The BOP test shall be performed before drilling out of the surface casing shoe and will occur at a minimum: a. when initially installed b. whenever any seal subject to test pressure is broken c. following related repairs d. at 30 day intervals e. checked daily as to mechanical operating conditions. The ram type preventer(s) will be tested using a test plug to 250 psi (low) and 5,000 psi (high) (casinghead WP) with a test plug upon its installation onto the 13 surface casing. If a test plug is not used, the ram type preventer(s) shall be tested to 70% of the minimum internal yield pressure of the casing. The annular type preventer(s) shall be tested to 3500 psi. Pressure will be maintained for at least 10 minutes or until provisions of the test are met, whichever is longer. A Sundry Notice (Form 3160 5), along with a copy of the BOP test report, shall be submitted to the local BLM office within 5 working days following the test. If the bleed line is connected into the buffer tank (header), all BOP equipment including the buffer tank and associated valves will be rated at the required BOP pressure. The BLM office will be provided with a minimum of four (4) hours notice of BOP testing to allow witnessing. The BOP Configuration, choke manifold layout, and accumulator system, will be in compliance with Onshore Order 2 for a 5,000 psi system. A remote accumulator and a multi-bowl system will be used, please see attachment in section 8 for multi-bowl procedure. Pressures, capacities, and specific placement and use of the manual and/or hydraulic controls, accumulator controls, bleed lines, etc., will be identified at the time of the BLM 'witnessed BOP test. Any remote controls will be capable of both opening and closing all preventers and shall be readily accessible. Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checked 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), choke lines, and choke manifold. See attached schematics.

Choke Diagram Attachment: 5 M Choe Manifold

BOP Diagram Attachment: BOP Schematic

3. Casing

String	Hole Size	Casing Size	Top	Bottom	Top TVD	Bottom TVD	Length	Grade	Weight	Connection	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
Surface	17.5	13.375	0	275	0	275	275	J55	54.5	BTC	8.32	3.12	Dry	7.91	Dry	7.42
Intermediate	12.25	9.625	0	3200	0	3200	3200	J55	36	BTC	2.91	1.66	Dry	2.97	Dry	2.62
Production	8.75	5.5	0	8319	0	7865	8319	P110RY	17	GeoConn	1.83	1.91	Dry	2.34	Dry	2.34
Production	7.875	5.5	8319	18271	7865	7865	9952	P110RY	17	GeoConn	1.83	1.91	Dry	2.34	Dry	2.34
BLM Min Safety Factor											1.125	1	1.6	1.6		

Non API casing spec sheets and casing design assumptions attached.

4. Cement

String	Lead/Tail	Top MD	Bottom MD	Quantity (sx)	Yield	Density	Cu Ft	Excess %	Cement Type	Additives
Surface	Tail	0	275	220	1.34	14.8	290	50%	Class C	Accelerator
Intermediate	Lead	0	2560	570	2.08	12.7	1180	50%	Class C	Salt, Extender, and LCM
Intermediate	Tail	2560	3200	240	1.34	14.8	310	50%	Class C	Accelerator
Production	Lead	2700	7569	700	2.41	11.5	1680	40%	Class H	POZ, Extender, Fluid Loss, Dispersant, Retarder
Production	Tail	7569	18271	1390	1.73	12.5	2400	25%	Class H	POZ, Extender, Fluid Loss, Dispersant, Retarder

5. Circulating Medium

Mud System Type: Closed

Will an air or gas system be used: No

Describe what will be on location to control well or mitigate other conditions: Sufficient quantities of mud materials will be on the well site at all times for the purpose of assuring well control and maintaining wellbore integrity. Surface interval will employ fresh water mud. The intermediate hole will utilize a saturated brine fluid to inhibit salt washout. The production hole will employ brine based and oil base fluid to inhibit formation reactivity and of the appropriate density to maintain well control.

Describe the mud monitoring system utilized: Centrifuge separation system. Open tank monitoring with EDR will be used for drilling fluids and return volumes. Open tank monitoring will be used for cement and cuttings return volumes. Mud properties will be monitored at least every 24 hours using industry accepted

Cuttings Volume: 8360 Cu Ft

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight	Max Weight
0	275	Spud Mud	8.6	9.5
275	3200	Salt Saturated	10	10
3200	8319	Water Based Mud	9	10
8319	18271	OBM	9	10

6. Test, Logging, Coring

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

Will utilize MWD/LWD (Gamma Ray logging) from intermediate hole to TD of the well.

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

DIRECTIONAL SURVEY,GAMMA RAY LOG,

Coring operation description for the well:

7. Pressure

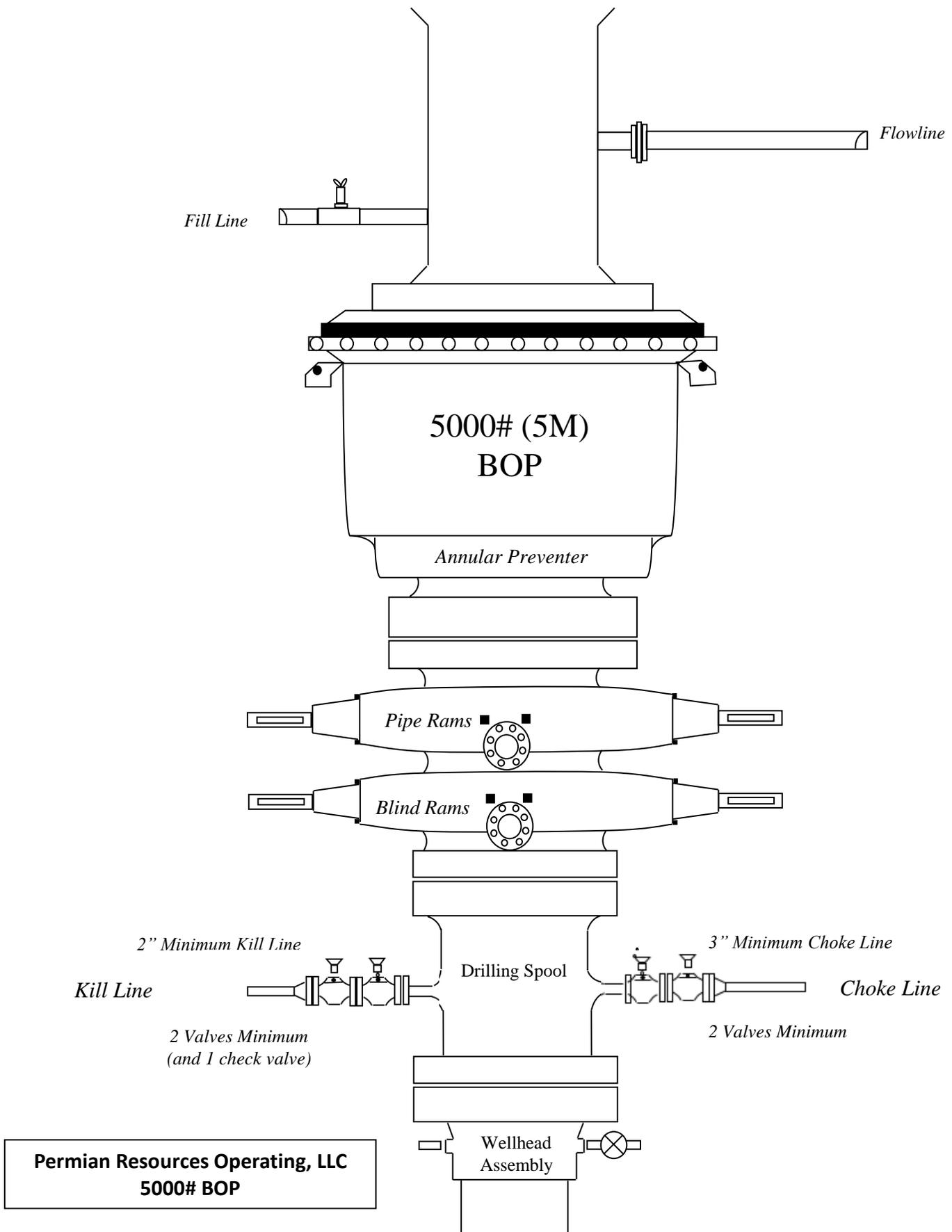
Anticipated Bottom Hole Pressure	4090	psi
Anticipated Surface Pressure	2359.5	psi
Anticipated Bottom Hole Temperature	136	°F
Anticipated Abnormal pressure, temp, or geo hazards	No	

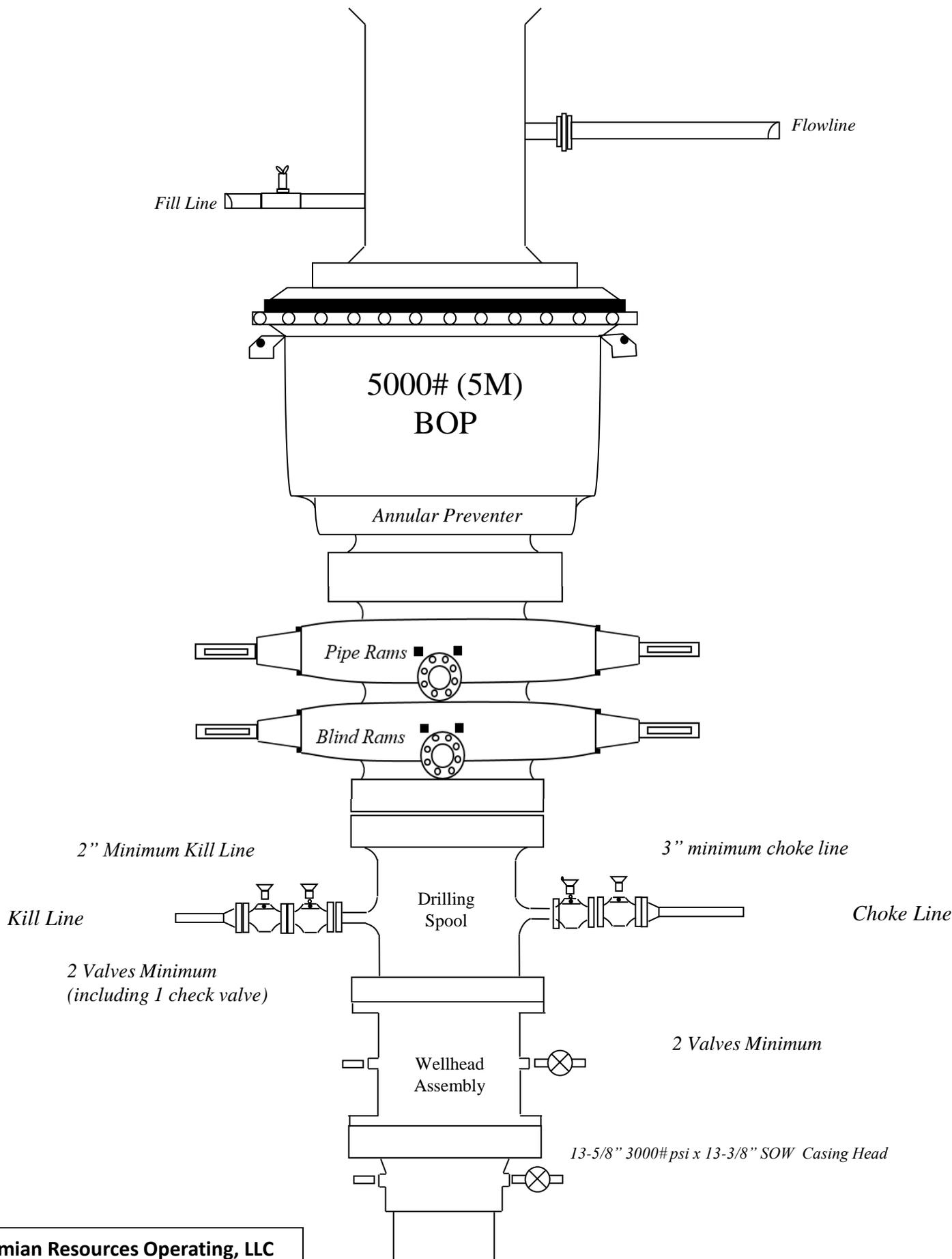
8. Waste Management

Waste Type:	Drilling
Waste content description:	Fresh water based drilling fluid
Amount of waste:	1500 bbls
Waste disposal frequency:	Weekly (after drilling all surfaces)
Safe containment description:	Steel tanks with plastic-lined containment berms
Waste disposal type:	Haul to commercial facility
Disposal location ownership:	Commercial
Waste Type:	Grey Water & Human Waste
Waste content description:	Grey Water/Human Waste
Amount of waste:	5000 gallons
Waste disposal frequency:	Weekly
Safe containment description:	Approved waste storage tanks with containment
Waste disposal type:	Haul to commercial facility
Disposal location ownership:	Commercial
Waste Type:	Garbage
Waste content description:	General trash/garbage
Amount of waste:	5000 lbs
Waste disposal frequency:	Weekly
Safe containment description:	Enclosed trash trailer
Waste disposal type:	Haul to commercial facility
Disposal location ownership:	Commercial
Waste Type:	Drilling
Waste content description:	Drill Cuttings
Amount of waste:	8360 Cu Ft
Waste disposal frequency:	Per well
Safe containment description:	Steel tanks
Waste disposal type:	Haul to commercial facility
Disposal location ownership:	Commercial
Waste Type:	Drilling
Waste content description:	Brine water based drilling fluid
Amount of waste:	1500 bbls
Waste disposal frequency:	Monthly
Safe containment description:	Steel tanks with plastic-lined containment berms
Waste disposal type:	Haul to commercial facility
Disposal location ownership:	Commercial

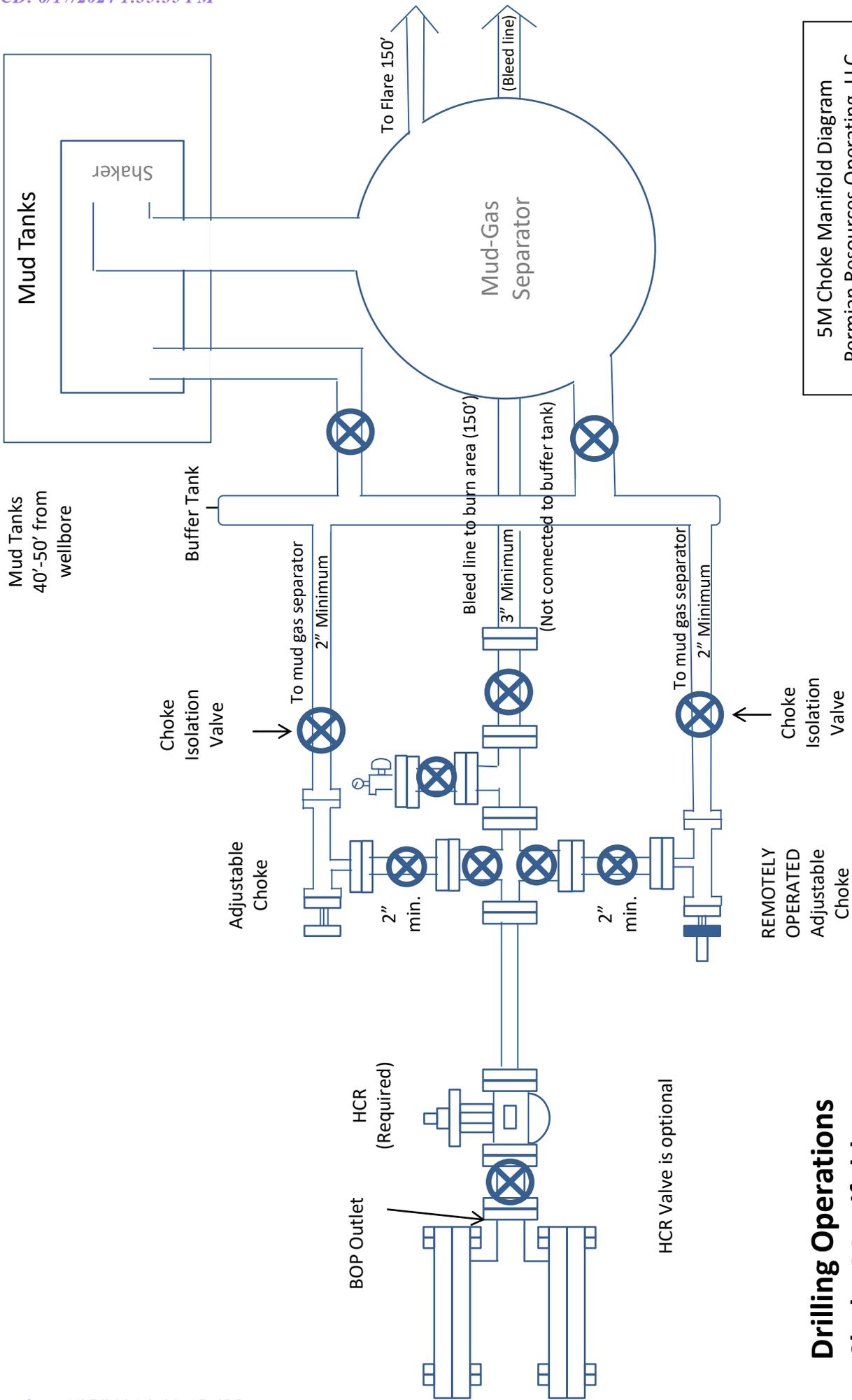
9. Other Information

Well Plan and AC Report: attached
Batching Drilling Procedure: attached
WBD: attached
Flex Hose Specs: attached
Offline Cementing Procedure Attached:



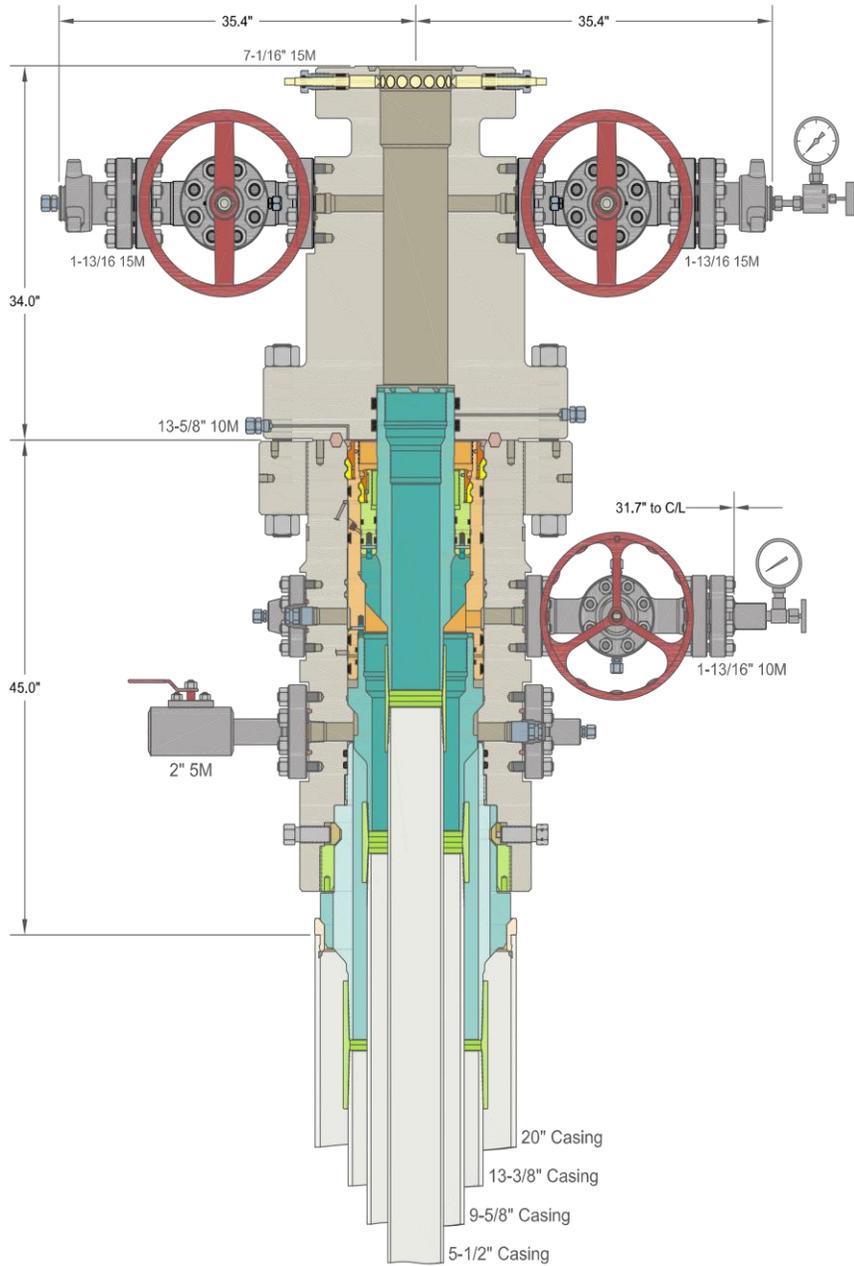


Permian Resources Operating, LLC
5000# BOP



5M Choke Manifold Diagram
 Permian Resources Operating, LLC

**Drilling Operations
 Choke Manifold
 5M Service**



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ALL DIMENSIONS APPROXIMATE

CACTUS WELLHEAD LLC

CENTENNIAL RESOURCE DEVELOPMENT
LEE CO, NM

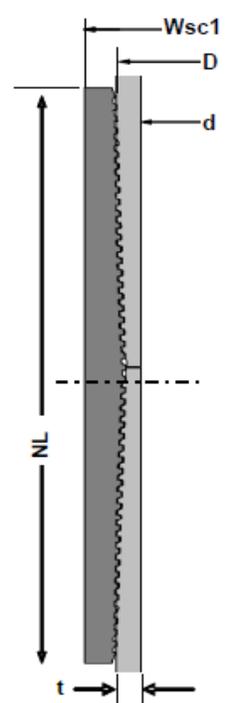
20" x 13-3/8" x 9-5/8" x 5-1/2" 10M MBU-3T-CFL-R-DBLO System
With 13-5/8" 10M x 7-1/16" 15M CTH-DBLHPS Tubing Head,
20" Landing Ring & Pin Down Mandrel Casing Hangers

DRAWN	DLE	10JUN20
APPRV		

DRAWING NO. HBE0000338

Metal One Corp. 	GEOCONN-SC Pipe: SeAH P110RY 95%PBW (SMYS110ksi) *1 Coupling: P110RY (SMYS110ksi) Connection Data Sheet	Page Date Rev.	MAI GC 5.5 17 SeAH P110RY 95%RBW+SC-Cplg6.050 P110RY 3-Feb-21 0
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GEOCONN-SC



Geometry	Imperial		S.I.	
Pipe Body				
Grade *1	P110RY	-	P110RY	-
SMYS	110	ksi	110	ksi
Pipe OD (D)	5.500	in	139.70	mm
Weight	17.00	lb/ft	25.33	kg/m
Wall Thickness (t)	0.304	in	7.72	mm
Pipe ID (d)	4.892	in	124.26	mm
Drift Dia.	4.767	in	121.08	mm
Connection				
Coupling SMYS	110	ksi	110	ksi
SC-Coupling OD (Wsc1)	6.050	in	153.67	mm
Coupling Length (NL)	8.350	in	212.09	mm
Make up Loss	4.125	in	104.78	mm
Pipe Critical Area	4.96	in ²	3,202	mm ²
Box Critical Area	6.10	in ²	3,937	mm ²
Thread Taper	1 / 16 (3/4" per ft)			
Number of Threads	5 TPI			

Performance	Imperial		S.I.	
Performance Properties for Pipe Body				
S.M.Y.S. *1	546	klps	2,428	kN
M.I.Y.P. *1	11,550	psi	79.66	MPa
Collapse Strength *1	7,480	psi	51.59	MPa

Note S.M.Y.S.= Specified Minimum YIELD Strength of Pipe body
 M.I.Y.P. = Minimum Internal Yield Pressure of Pipe body

*1: SeAH P110RY 95%RBW: SMYS110ksi, MIYP11,550psi

Performance Properties for Connection	
Min. Connection Joint Strength	100% of S.M.Y.S.
Min. Compression Yield	100% of S.M.Y.S.
Internal Pressure	100% of M.I.Y.P.
External Pressure	100% of Collapse Strength
Max. DLS (deg. /100ft)	>90

Recommended Torque				
Min.	10,800	ft-lb	14,600	N-m
Opti.	12,000	ft-lb	16,200	N-m
Max.	13,200	ft-lb	17,800	N-m
Operational Max.	15,600	ft-lb	21,100	N-m

Note : Operational Max. torque can be applied for high torque application

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 The products described in this Connection Data Sheet are not recommended for use in deep water offshore applications. For more information, please refer to http://www.mto.co.jp/mo-con/_images/top/WebsiteTerms_Active_20333287_1.pdf the contents of which are incorporated by reference into this Connection Data Sheet.

NEW MEXICO

(SP) EDDY

CASSIUS FED COM

CASSIUS FED COM 114H

OWB

Plan: PWP0

Standard Planning Report - Geographic

05 June, 2024

Planning Report - Geographic

Database:	Compass_17	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Company:	NEW MEXICO	TVD Reference:	KB @ 3030.0usft
Project:	(SP) EDDY	MD Reference:	KB @ 3030.0usft
Site:	CASSIUS FED COM	North Reference:	Grid
Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWP0		

Project	(SP) EDDY		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	CASSIUS FED COM				
Site Position:		Northing:	471,508.05 usft	Latitude:	32° 17' 44.600 N
From:	Map	Easting:	654,053.83 usft	Longitude:	103° 58' 6.757 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "		

Well	CASSIUS FED COM 114H					
Well Position	+N/-S	0.0 usft	Northing:	471,508.05 usft	Latitude:	32° 17' 44.599 N
	+E/-W	0.0 usft	Easting:	654,086.83 usft	Longitude:	103° 58' 6.373 W
Position Uncertainty	0.0 usft		Wellhead Elevation:	usft	Ground Level:	3,000.0 usft
Grid Convergence:	0.19 °					

Wellbore	OWB					
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength	
			(°)	(°)	(nT)	
	IGRF200510	12/31/2009	7.94	60.24	48,795.25386451	

Design	PWP0				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	4.88	

Plan Survey Tool Program	Date	6/5/2024			
Depth From	Depth To	Survey (Wellbore)	Tool Name	Remarks	
(usft)	(usft)				
1	0.0	18,271.5 PWP0 (OWB)	MWD		
			OWSG_Rev2_ MWD - Standar		

Plan Sections											
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target	
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)		
(usft)			(usft)			(°/100usft)	(°/100usft)	(°/100usft)			
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	0.00	
2,826.9	16.54	49.55	2,815.5	76.9	90.2	2.00	2.00	0.00	49.55		
6,683.0	16.54	49.55	6,512.0	789.1	925.4	0.00	0.00	0.00	0.00		
7,509.9	0.00	0.00	7,327.5	866.0	1,015.6	2.00	-2.00	0.00	180.00		
7,569.9	0.00	0.00	7,387.5	866.0	1,015.6	0.00	0.00	0.00	0.00		
8,319.9	90.00	359.72	7,865.0	1,343.5	1,013.2	12.00	12.00	-0.04	359.72		
18,271.5	90.00	359.72	7,865.0	11,295.0	963.8	0.00	0.00	0.00	0.00	0.00	BHL CFC 114H

Planning Report - Geographic

Database:	Compass_17	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Company:	NEW MEXICO	TVD Reference:	KB @ 3030.0usft
Project:	(SP) EDDY	MD Reference:	KB @ 3030.0usft
Site:	CASSIUS FED COM	North Reference:	Grid
Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWPO		

Planned Survey											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude		
0.0	0.00	0.00	0.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
100.0	0.00	0.00	100.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
200.0	0.00	0.00	200.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
300.0	0.00	0.00	300.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
400.0	0.00	0.00	400.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
500.0	0.00	0.00	500.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
600.0	0.00	0.00	600.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
700.0	0.00	0.00	700.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
800.0	0.00	0.00	800.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
900.0	0.00	0.00	900.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
1,000.0	0.00	0.00	1,000.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
1,100.0	0.00	0.00	1,100.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
1,200.0	0.00	0.00	1,200.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
1,300.0	0.00	0.00	1,300.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
1,400.0	0.00	0.00	1,400.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
1,500.0	0.00	0.00	1,500.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
1,600.0	0.00	0.00	1,600.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
1,700.0	0.00	0.00	1,700.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
1,800.0	0.00	0.00	1,800.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
1,900.0	0.00	0.00	1,900.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
2,000.0	0.00	0.00	2,000.0	0.0	0.0	471,508.05	654,086.83	32° 17' 44.599 N	103° 58' 6.373 W		
Start Build 2.00											
2,100.0	2.00	49.55	2,100.0	1.1	1.3	471,509.18	654,088.16	32° 17' 44.610 N	103° 58' 6.357 W		
2,200.0	4.00	49.55	2,199.8	4.5	5.3	471,512.58	654,092.14	32° 17' 44.643 N	103° 58' 6.311 W		
2,300.0	6.00	49.55	2,299.5	10.2	11.9	471,518.23	654,098.78	32° 17' 44.699 N	103° 58' 6.233 W		
2,400.0	8.00	49.55	2,398.7	18.1	21.2	471,526.14	654,108.05	32° 17' 44.777 N	103° 58' 6.125 W		
2,500.0	10.00	49.55	2,497.5	28.2	33.1	471,536.29	654,119.95	32° 17' 44.877 N	103° 58' 5.986 W		
2,600.0	12.00	49.55	2,595.6	40.6	47.6	471,548.67	654,134.47	32° 17' 44.999 N	103° 58' 5.816 W		
2,700.0	14.00	49.55	2,693.1	55.2	64.8	471,563.27	654,151.59	32° 17' 45.143 N	103° 58' 5.616 W		
2,800.0	16.00	49.55	2,789.6	72.0	84.4	471,580.06	654,171.28	32° 17' 45.308 N	103° 58' 5.386 W		
2,826.9	16.54	49.55	2,815.5	76.9	90.2	471,584.96	654,177.02	32° 17' 45.357 N	103° 58' 5.319 W		
Start 3856.0 hold at 2826.9 MD											
2,900.0	16.54	49.55	2,885.5	90.4	106.0	471,598.45	654,192.85	32° 17' 45.490 N	103° 58' 5.134 W		
3,000.0	16.54	49.55	2,981.4	108.9	127.7	471,616.92	654,214.51	32° 17' 45.672 N	103° 58' 4.881 W		
3,100.0	16.54	49.55	3,077.3	127.3	149.3	471,635.39	654,236.17	32° 17' 45.854 N	103° 58' 4.628 W		
3,200.0	16.54	49.55	3,173.1	145.8	171.0	471,653.86	654,257.83	32° 17' 46.036 N	103° 58' 4.375 W		
3,300.0	16.54	49.55	3,269.0	164.3	192.7	471,672.33	654,279.49	32° 17' 46.218 N	103° 58' 4.122 W		
3,400.0	16.54	49.55	3,364.9	182.8	214.3	471,690.80	654,301.15	32° 17' 46.400 N	103° 58' 3.868 W		
3,500.0	16.54	49.55	3,460.7	201.2	236.0	471,709.27	654,322.81	32° 17' 46.582 N	103° 58' 3.615 W		
3,600.0	16.54	49.55	3,556.6	219.7	257.6	471,727.74	654,344.47	32° 17' 46.764 N	103° 58' 3.362 W		
3,700.0	16.54	49.55	3,652.4	238.2	279.3	471,746.21	654,366.13	32° 17' 46.946 N	103° 58' 3.109 W		
3,800.0	16.54	49.55	3,748.3	256.6	301.0	471,764.68	654,387.79	32° 17' 47.128 N	103° 58' 2.856 W		
3,900.0	16.54	49.55	3,844.2	275.1	322.6	471,783.16	654,409.45	32° 17' 47.310 N	103° 58' 2.603 W		
4,000.0	16.54	49.55	3,940.0	293.6	344.3	471,801.63	654,431.12	32° 17' 47.492 N	103° 58' 2.350 W		
4,100.0	16.54	49.55	4,035.9	312.0	365.9	471,820.10	654,452.78	32° 17' 47.674 N	103° 58' 2.097 W		
4,200.0	16.54	49.55	4,131.8	330.5	387.6	471,838.57	654,474.44	32° 17' 47.856 N	103° 58' 1.844 W		
4,300.0	16.54	49.55	4,227.6	349.0	409.3	471,857.04	654,496.10	32° 17' 48.038 N	103° 58' 1.591 W		
4,400.0	16.54	49.55	4,323.5	367.5	430.9	471,875.51	654,517.76	32° 17' 48.220 N	103° 58' 1.337 W		
4,500.0	16.54	49.55	4,419.3	385.9	452.6	471,893.98	654,539.42	32° 17' 48.403 N	103° 58' 1.084 W		
4,600.0	16.54	49.55	4,515.2	404.4	474.2	471,912.45	654,561.08	32° 17' 48.585 N	103° 58' 0.831 W		
4,700.0	16.54	49.55	4,611.1	422.9	495.9	471,930.92	654,582.74	32° 17' 48.767 N	103° 58' 0.578 W		
4,800.0	16.54	49.55	4,706.9	441.3	517.6	471,949.39	654,604.40	32° 17' 48.949 N	103° 58' 0.325 W		
4,900.0	16.54	49.55	4,802.8	459.8	539.2	471,967.86	654,626.06	32° 17' 49.131 N	103° 58' 0.072 W		

Planning Report - Geographic

Database:	Compass_17	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Company:	NEW MEXICO	TVD Reference:	KB @ 3030.0usft
Project:	(SP) EDDY	MD Reference:	KB @ 3030.0usft
Site:	CASSIUS FED COM	North Reference:	Grid
Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWPO		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,000.0	16.54	49.55	4,898.7	478.3	560.9	471,986.33	654,647.72	32° 17' 49.313 N	103° 57' 59.819 W	
5,100.0	16.54	49.55	4,994.5	496.8	582.5	472,004.80	654,669.38	32° 17' 49.495 N	103° 57' 59.566 W	
5,200.0	16.54	49.55	5,090.4	515.2	604.2	472,023.27	654,691.04	32° 17' 49.677 N	103° 57' 59.313 W	
5,300.0	16.54	49.55	5,186.2	533.7	625.9	472,041.74	654,712.71	32° 17' 49.859 N	103° 57' 59.060 W	
5,400.0	16.54	49.55	5,282.1	552.2	647.5	472,060.21	654,734.37	32° 17' 50.041 N	103° 57' 58.806 W	
5,500.0	16.54	49.55	5,378.0	570.6	669.2	472,078.68	654,756.03	32° 17' 50.223 N	103° 57' 58.553 W	
5,600.0	16.54	49.55	5,473.8	589.1	690.9	472,097.16	654,777.69	32° 17' 50.405 N	103° 57' 58.300 W	
5,700.0	16.54	49.55	5,569.7	607.6	712.5	472,115.63	654,799.35	32° 17' 50.587 N	103° 57' 58.047 W	
5,800.0	16.54	49.55	5,665.6	626.0	734.2	472,134.10	654,821.01	32° 17' 50.769 N	103° 57' 57.794 W	
5,900.0	16.54	49.55	5,761.4	644.5	755.8	472,152.57	654,842.67	32° 17' 50.951 N	103° 57' 57.541 W	
6,000.0	16.54	49.55	5,857.3	663.0	777.5	472,171.04	654,864.33	32° 17' 51.133 N	103° 57' 57.288 W	
6,100.0	16.54	49.55	5,953.1	681.5	799.2	472,189.51	654,885.99	32° 17' 51.315 N	103° 57' 57.035 W	
6,200.0	16.54	49.55	6,049.0	699.9	820.8	472,207.98	654,907.65	32° 17' 51.497 N	103° 57' 56.782 W	
6,300.0	16.54	49.55	6,144.9	718.4	842.5	472,226.45	654,929.31	32° 17' 51.679 N	103° 57' 56.529 W	
6,400.0	16.54	49.55	6,240.7	736.9	864.1	472,244.92	654,950.97	32° 17' 51.861 N	103° 57' 56.275 W	
6,500.0	16.54	49.55	6,336.6	755.3	885.8	472,263.39	654,972.63	32° 17' 52.043 N	103° 57' 56.022 W	
6,558.0	16.54	49.55	6,392.2	766.1	898.4	472,274.10	654,985.20	32° 17' 52.149 N	103° 57' 55.876 W	
NMNM 111416 Entry at 6558.0 MD										
6,600.0	16.54	49.55	6,432.5	773.8	907.5	472,281.86	654,994.30	32° 17' 52.226 N	103° 57' 55.769 W	
6,683.0	16.54	49.55	6,512.0	789.1	925.4	472,297.18	655,012.27	32° 17' 52.377 N	103° 57' 55.559 W	
Start Drop -2.00										
6,700.0	16.20	49.55	6,528.3	792.2	929.1	472,300.30	655,015.92	32° 17' 52.407 N	103° 57' 55.517 W	
6,800.0	14.20	49.55	6,624.8	809.3	949.0	472,317.31	655,035.87	32° 17' 52.575 N	103° 57' 55.283 W	
6,900.0	12.20	49.55	6,722.2	824.1	966.4	472,332.12	655,053.24	32° 17' 52.721 N	103° 57' 55.080 W	
7,000.0	10.20	49.55	6,820.3	836.7	981.2	472,344.72	655,068.02	32° 17' 52.845 N	103° 57' 54.908 W	
7,100.0	8.20	49.55	6,919.0	847.0	993.3	472,355.09	655,080.18	32° 17' 52.947 N	103° 57' 54.766 W	
7,200.0	6.20	49.55	7,018.2	855.2	1,002.9	472,363.22	655,089.71	32° 17' 53.027 N	103° 57' 54.654 W	
7,300.0	4.20	49.55	7,117.8	861.1	1,009.8	472,369.10	655,096.61	32° 17' 53.085 N	103° 57' 54.574 W	
7,400.0	2.20	49.55	7,217.6	864.7	1,014.0	472,372.72	655,100.85	32° 17' 53.121 N	103° 57' 54.524 W	
7,509.9	0.00	0.00	7,327.5	866.0	1,015.6	472,374.09	655,102.45	32° 17' 53.135 N	103° 57' 54.505 W	
Start 60.0 hold at 7509.9 MD										
7,569.9	0.00	0.00	7,387.5	866.0	1,015.6	472,374.09	655,102.45	32° 17' 53.135 N	103° 57' 54.505 W	
Start DLS 12.00 TFO 359.72										
7,575.0	0.61	359.72	7,392.6	866.1	1,015.6	472,374.12	655,102.45	32° 17' 53.135 N	103° 57' 54.505 W	
7,600.0	3.61	359.72	7,417.6	867.0	1,015.6	472,375.04	655,102.45	32° 17' 53.144 N	103° 57' 54.505 W	
7,625.0	6.61	359.72	7,442.5	869.2	1,015.6	472,377.27	655,102.44	32° 17' 53.166 N	103° 57' 54.505 W	
7,650.0	9.61	359.72	7,467.2	872.7	1,015.6	472,380.79	655,102.42	32° 17' 53.201 N	103° 57' 54.505 W	
7,675.0	12.61	359.72	7,491.7	877.6	1,015.6	472,385.61	655,102.40	32° 17' 53.249 N	103° 57' 54.506 W	
7,700.0	15.61	359.72	7,516.0	883.7	1,015.5	472,391.70	655,102.37	32° 17' 53.309 N	103° 57' 54.506 W	
7,725.0	18.61	359.72	7,539.9	891.0	1,015.5	472,399.06	655,102.33	32° 17' 53.382 N	103° 57' 54.506 W	
7,750.0	21.61	359.72	7,563.4	899.6	1,015.5	472,407.65	655,102.29	32° 17' 53.467 N	103° 57' 54.506 W	
7,775.0	24.61	359.72	7,586.3	909.4	1,015.4	472,417.46	655,102.24	32° 17' 53.564 N	103° 57' 54.506 W	
7,800.0	27.61	359.72	7,608.8	920.4	1,015.3	472,428.47	655,102.18	32° 17' 53.673 N	103° 57' 54.506 W	
7,825.0	30.61	359.72	7,630.6	932.6	1,015.3	472,440.63	655,102.12	32° 17' 53.793 N	103° 57' 54.507 W	
7,850.0	33.61	359.72	7,651.8	945.9	1,015.2	472,453.91	655,102.06	32° 17' 53.924 N	103° 57' 54.507 W	
7,875.0	36.61	359.72	7,672.2	960.2	1,015.2	472,468.29	655,101.99	32° 17' 54.067 N	103° 57' 54.507 W	
7,900.0	39.61	359.72	7,691.9	975.7	1,015.1	472,483.72	655,101.91	32° 17' 54.219 N	103° 57' 54.507 W	
7,925.0	42.61	359.72	7,710.8	992.1	1,015.0	472,500.15	655,101.83	32° 17' 54.382 N	103° 57' 54.508 W	
7,950.0	45.61	359.72	7,728.7	1,009.5	1,014.9	472,517.55	655,101.74	32° 17' 54.554 N	103° 57' 54.508 W	
7,975.0	48.61	359.72	7,745.7	1,027.8	1,014.8	472,535.87	655,101.65	32° 17' 54.735 N	103° 57' 54.508 W	
8,000.0	51.61	359.72	7,761.7	1,047.0	1,014.7	472,555.05	655,101.56	32° 17' 54.925 N	103° 57' 54.509 W	
8,025.0	54.61	359.72	7,776.7	1,067.0	1,014.6	472,575.04	655,101.46	32° 17' 55.123 N	103° 57' 54.509 W	
8,050.0	57.61	359.72	7,790.7	1,087.7	1,014.5	472,595.79	655,101.35	32° 17' 55.328 N	103° 57' 54.509 W	

Planning Report - Geographic

Database:	Compass_17	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Company:	NEW MEXICO	TVD Reference:	KB @ 3030.0usft
Project:	(SP) EDDY	MD Reference:	KB @ 3030.0usft
Site:	CASSIUS FED COM	North Reference:	Grid
Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWPO		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
8,075.0	60.61	359.72	7,803.5	1,109.2	1,014.4	472,617.24	655,101.25	32° 17' 55.541 N	103° 57' 54.510 W	
8,100.0	63.61	359.72	7,815.2	1,131.3	1,014.3	472,639.34	655,101.14	32° 17' 55.759 N	103° 57' 54.510 W	
8,125.0	66.61	359.72	7,825.7	1,154.0	1,014.2	472,662.01	655,101.02	32° 17' 55.984 N	103° 57' 54.511 W	
8,150.0	69.61	359.72	7,835.1	1,177.2	1,014.1	472,685.21	655,100.91	32° 17' 56.213 N	103° 57' 54.511 W	
8,175.0	72.61	359.72	7,843.1	1,200.8	1,014.0	472,708.86	655,100.79	32° 17' 56.447 N	103° 57' 54.511 W	
8,200.0	75.61	359.72	7,850.0	1,224.8	1,013.8	472,732.90	655,100.67	32° 17' 56.685 N	103° 57' 54.512 W	
8,225.0	78.61	359.72	7,855.6	1,249.2	1,013.7	472,757.27	655,100.55	32° 17' 56.926 N	103° 57' 54.512 W	
8,250.0	81.61	359.72	7,859.9	1,273.8	1,013.6	472,781.89	655,100.43	32° 17' 57.170 N	103° 57' 54.513 W	
8,275.0	84.61	359.72	7,862.9	1,298.7	1,013.5	472,806.71	655,100.30	32° 17' 57.416 N	103° 57' 54.513 W	
8,300.0	87.61	359.72	7,864.5	1,323.6	1,013.3	472,831.65	655,100.18	32° 17' 57.662 N	103° 57' 54.514 W	
8,319.9	90.00	359.72	7,865.0	1,343.5	1,013.2	472,851.55	655,100.08	32° 17' 57.859 N	103° 57' 54.514 W	
Start 9951.6 hold at 8319.9 MD										
8,400.0	90.00	359.72	7,865.0	1,423.6	1,012.8	472,931.64	655,099.68	32° 17' 58.652 N	103° 57' 54.515 W	
8,500.0	90.00	359.72	7,865.0	1,523.6	1,012.4	473,031.64	655,099.19	32° 17' 59.642 N	103° 57' 54.517 W	
8,600.0	90.00	359.72	7,865.0	1,623.6	1,011.9	473,131.64	655,098.69	32° 18' 0.631 N	103° 57' 54.519 W	
8,700.0	90.00	359.72	7,865.0	1,723.6	1,011.4	473,231.64	655,098.19	32° 18' 1.621 N	103° 57' 54.521 W	
8,800.0	90.00	359.72	7,865.0	1,823.6	1,010.9	473,331.63	655,097.69	32° 18' 2.610 N	103° 57' 54.523 W	
8,900.0	90.00	359.72	7,865.0	1,923.6	1,010.4	473,431.63	655,097.20	32° 18' 3.600 N	103° 57' 54.524 W	
9,000.0	90.00	359.72	7,865.0	2,023.6	1,009.9	473,531.63	655,096.70	32° 18' 4.589 N	103° 57' 54.526 W	
9,100.0	90.00	359.72	7,865.0	2,123.6	1,009.4	473,631.63	655,096.20	32° 18' 5.579 N	103° 57' 54.528 W	
9,200.0	90.00	359.72	7,865.0	2,223.6	1,008.9	473,731.63	655,095.71	32° 18' 6.569 N	103° 57' 54.530 W	
9,300.0	90.00	359.72	7,865.0	2,323.6	1,008.4	473,831.63	655,095.21	32° 18' 7.558 N	103° 57' 54.531 W	
9,400.0	90.00	359.72	7,865.0	2,423.6	1,007.9	473,931.63	655,094.71	32° 18' 8.548 N	103° 57' 54.533 W	
9,500.0	90.00	359.72	7,865.0	2,523.6	1,007.4	474,031.63	655,094.22	32° 18' 9.537 N	103° 57' 54.535 W	
9,600.0	90.00	359.72	7,865.0	2,623.6	1,006.9	474,131.62	655,093.72	32° 18' 10.527 N	103° 57' 54.537 W	
9,700.0	90.00	359.72	7,865.0	2,723.6	1,006.4	474,231.62	655,093.22	32° 18' 11.516 N	103° 57' 54.539 W	
9,800.0	90.00	359.72	7,865.0	2,823.6	1,005.9	474,331.62	655,092.72	32° 18' 12.506 N	103° 57' 54.540 W	
9,900.0	90.00	359.72	7,865.0	2,923.6	1,005.4	474,431.62	655,092.23	32° 18' 13.496 N	103° 57' 54.542 W	
10,000.0	90.00	359.72	7,865.0	3,023.6	1,004.9	474,531.62	655,091.73	32° 18' 14.485 N	103° 57' 54.544 W	
10,100.0	90.00	359.72	7,865.0	3,123.6	1,004.4	474,631.62	655,091.23	32° 18' 15.475 N	103° 57' 54.546 W	
10,200.0	90.00	359.72	7,865.0	3,223.6	1,003.9	474,731.62	655,090.74	32° 18' 16.464 N	103° 57' 54.548 W	
10,300.0	90.00	359.72	7,865.0	3,323.6	1,003.4	474,831.62	655,090.24	32° 18' 17.454 N	103° 57' 54.549 W	
10,400.0	90.00	359.72	7,865.0	3,423.6	1,002.9	474,931.61	655,089.74	32° 18' 18.444 N	103° 57' 54.551 W	
10,500.0	90.00	359.72	7,865.0	3,523.6	1,002.4	475,031.61	655,089.24	32° 18' 19.433 N	103° 57' 54.553 W	
10,600.0	90.00	359.72	7,865.0	3,623.6	1,001.9	475,131.61	655,088.75	32° 18' 20.423 N	103° 57' 54.555 W	
10,700.0	90.00	359.72	7,865.0	3,723.6	1,001.4	475,231.61	655,088.25	32° 18' 21.412 N	103° 57' 54.557 W	
10,800.0	90.00	359.72	7,865.0	3,823.6	1,000.9	475,331.61	655,087.75	32° 18' 22.402 N	103° 57' 54.558 W	
10,900.0	90.00	359.72	7,865.0	3,923.6	1,000.4	475,431.61	655,087.26	32° 18' 23.391 N	103° 57' 54.560 W	
11,000.0	90.00	359.72	7,865.0	4,023.6	999.9	475,531.61	655,086.76	32° 18' 24.381 N	103° 57' 54.562 W	
11,100.0	90.00	359.72	7,865.0	4,123.6	999.4	475,631.61	655,086.26	32° 18' 25.371 N	103° 57' 54.564 W	
11,200.0	90.00	359.72	7,865.0	4,223.6	998.9	475,731.60	655,085.77	32° 18' 26.360 N	103° 57' 54.565 W	
11,300.0	90.00	359.72	7,865.0	4,323.6	998.4	475,831.60	655,085.27	32° 18' 27.350 N	103° 57' 54.567 W	
11,400.0	90.00	359.72	7,865.0	4,423.6	997.9	475,931.60	655,084.77	32° 18' 28.339 N	103° 57' 54.569 W	
11,500.0	90.00	359.72	7,865.0	4,523.6	997.4	476,031.60	655,084.27	32° 18' 29.329 N	103° 57' 54.571 W	
11,600.0	90.00	359.72	7,865.0	4,623.5	996.9	476,131.60	655,083.78	32° 18' 30.318 N	103° 57' 54.573 W	
11,700.0	90.00	359.72	7,865.0	4,723.5	996.4	476,231.60	655,083.28	32° 18' 31.308 N	103° 57' 54.574 W	
11,800.0	90.00	359.72	7,865.0	4,823.5	995.9	476,331.60	655,082.78	32° 18' 32.298 N	103° 57' 54.576 W	
11,900.0	90.00	359.72	7,865.0	4,923.5	995.5	476,431.60	655,082.29	32° 18' 33.287 N	103° 57' 54.578 W	
12,000.0	90.00	359.72	7,865.0	5,023.5	995.0	476,531.59	655,081.79	32° 18' 34.277 N	103° 57' 54.580 W	
12,100.0	90.00	359.72	7,865.0	5,123.5	994.5	476,631.59	655,081.29	32° 18' 35.266 N	103° 57' 54.582 W	
12,200.0	90.00	359.72	7,865.0	5,223.5	994.0	476,731.59	655,080.79	32° 18' 36.256 N	103° 57' 54.583 W	
12,300.0	90.00	359.72	7,865.0	5,323.5	993.5	476,831.59	655,080.30	32° 18' 37.246 N	103° 57' 54.585 W	
12,400.0	90.00	359.72	7,865.0	5,423.5	993.0	476,931.59	655,079.80	32° 18' 38.235 N	103° 57' 54.587 W	
12,500.0	90.00	359.72	7,865.0	5,523.5	992.5	477,031.59	655,079.30	32° 18' 39.225 N	103° 57' 54.589 W	

Planning Report - Geographic

Database:	Compass_17	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Company:	NEW MEXICO	TVD Reference:	KB @ 3030.0usft
Project:	(SP) EDDY	MD Reference:	KB @ 3030.0usft
Site:	CASSIUS FED COM	North Reference:	Grid
Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWPO		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
12,600.0	90.00	359.72	7,865.0	5,623.5	992.0	477,131.59	655,078.81	32° 18' 40.214 N	103° 57' 54.591 W	
12,700.0	90.00	359.72	7,865.0	5,723.5	991.5	477,231.59	655,078.31	32° 18' 41.204 N	103° 57' 54.592 W	
12,800.0	90.00	359.72	7,865.0	5,823.5	991.0	477,331.58	655,077.81	32° 18' 42.193 N	103° 57' 54.594 W	
12,900.0	90.00	359.72	7,865.0	5,923.5	990.5	477,431.58	655,077.31	32° 18' 43.183 N	103° 57' 54.596 W	
13,000.0	90.00	359.72	7,865.0	6,023.5	990.0	477,531.58	655,076.82	32° 18' 44.173 N	103° 57' 54.598 W	
13,100.0	90.00	359.72	7,865.0	6,123.5	989.5	477,631.58	655,076.32	32° 18' 45.162 N	103° 57' 54.599 W	
13,200.0	90.00	359.72	7,865.0	6,223.5	989.0	477,731.58	655,075.82	32° 18' 46.152 N	103° 57' 54.601 W	
13,300.0	90.00	359.72	7,865.0	6,323.5	988.5	477,831.58	655,075.33	32° 18' 47.141 N	103° 57' 54.603 W	
13,400.0	90.00	359.72	7,865.0	6,423.5	988.0	477,931.58	655,074.83	32° 18' 48.131 N	103° 57' 54.605 W	
13,500.0	90.00	359.72	7,865.0	6,523.5	987.5	478,031.58	655,074.33	32° 18' 49.120 N	103° 57' 54.607 W	
13,600.0	90.00	359.72	7,865.0	6,623.5	987.0	478,131.57	655,073.84	32° 18' 50.110 N	103° 57' 54.608 W	
13,700.0	90.00	359.72	7,865.0	6,723.5	986.5	478,231.57	655,073.34	32° 18' 51.100 N	103° 57' 54.610 W	
13,800.0	90.00	359.72	7,865.0	6,823.5	986.0	478,331.57	655,072.84	32° 18' 52.089 N	103° 57' 54.612 W	
13,900.0	90.00	359.72	7,865.0	6,923.5	985.5	478,431.57	655,072.34	32° 18' 53.079 N	103° 57' 54.614 W	
14,000.0	90.00	359.72	7,865.0	7,023.5	985.0	478,531.57	655,071.85	32° 18' 54.068 N	103° 57' 54.616 W	
14,100.0	90.00	359.72	7,865.0	7,123.5	984.5	478,631.57	655,071.35	32° 18' 55.058 N	103° 57' 54.617 W	
14,200.0	90.00	359.72	7,865.0	7,223.5	984.0	478,731.57	655,070.85	32° 18' 56.047 N	103° 57' 54.619 W	
14,300.0	90.00	359.72	7,865.0	7,323.5	983.5	478,831.57	655,070.36	32° 18' 57.037 N	103° 57' 54.621 W	
14,400.0	90.00	359.72	7,865.0	7,423.5	983.0	478,931.57	655,069.86	32° 18' 58.027 N	103° 57' 54.623 W	
14,500.0	90.00	359.72	7,865.0	7,523.5	982.5	479,031.56	655,069.36	32° 18' 59.016 N	103° 57' 54.625 W	
14,600.0	90.00	359.72	7,865.0	7,623.5	982.0	479,131.56	655,068.86	32° 19' 0.006 N	103° 57' 54.626 W	
14,700.0	90.00	359.72	7,865.0	7,723.5	981.5	479,231.56	655,068.37	32° 19' 0.995 N	103° 57' 54.628 W	
14,800.0	90.00	359.72	7,865.0	7,823.5	981.0	479,331.56	655,067.87	32° 19' 1.985 N	103° 57' 54.630 W	
14,900.0	90.00	359.72	7,865.0	7,923.5	980.5	479,431.56	655,067.37	32° 19' 2.975 N	103° 57' 54.632 W	
15,000.0	90.00	359.72	7,865.0	8,023.5	980.0	479,531.56	655,066.88	32° 19' 3.964 N	103° 57' 54.633 W	
15,100.0	90.00	359.72	7,865.0	8,123.5	979.5	479,631.56	655,066.38	32° 19' 4.954 N	103° 57' 54.635 W	
15,200.0	90.00	359.72	7,865.0	8,223.5	979.0	479,731.56	655,065.88	32° 19' 5.943 N	103° 57' 54.637 W	
15,300.0	90.00	359.72	7,865.0	8,323.5	978.6	479,831.55	655,065.39	32° 19' 6.933 N	103° 57' 54.639 W	
15,400.0	90.00	359.72	7,865.0	8,423.5	978.1	479,931.55	655,064.89	32° 19' 7.922 N	103° 57' 54.641 W	
15,500.0	90.00	359.72	7,865.0	8,523.5	977.6	480,031.55	655,064.39	32° 19' 8.912 N	103° 57' 54.642 W	
15,600.0	90.00	359.72	7,865.0	8,623.5	977.1	480,131.55	655,063.89	32° 19' 9.902 N	103° 57' 54.644 W	
15,700.0	90.00	359.72	7,865.0	8,723.5	976.6	480,231.55	655,063.40	32° 19' 10.891 N	103° 57' 54.646 W	
15,800.0	90.00	359.72	7,865.0	8,823.5	976.1	480,331.55	655,062.90	32° 19' 11.881 N	103° 57' 54.648 W	
15,900.0	90.00	359.72	7,865.0	8,923.5	975.6	480,431.55	655,062.40	32° 19' 12.870 N	103° 57' 54.650 W	
16,000.0	90.00	359.72	7,865.0	9,023.5	975.1	480,531.55	655,061.91	32° 19' 13.860 N	103° 57' 54.651 W	
16,100.0	90.00	359.72	7,865.0	9,123.5	974.6	480,631.54	655,061.41	32° 19' 14.849 N	103° 57' 54.653 W	
16,200.0	90.00	359.72	7,865.0	9,223.5	974.1	480,731.54	655,060.91	32° 19' 15.839 N	103° 57' 54.655 W	
16,300.0	90.00	359.72	7,865.0	9,323.5	973.6	480,831.54	655,060.41	32° 19' 16.829 N	103° 57' 54.657 W	
16,400.0	90.00	359.72	7,865.0	9,423.5	973.1	480,931.54	655,059.92	32° 19' 17.818 N	103° 57' 54.659 W	
16,500.0	90.00	359.72	7,865.0	9,523.5	972.6	481,031.54	655,059.42	32° 19' 18.808 N	103° 57' 54.660 W	
16,600.0	90.00	359.72	7,865.0	9,623.5	972.1	481,131.54	655,058.92	32° 19' 19.797 N	103° 57' 54.662 W	
16,700.0	90.00	359.72	7,865.0	9,723.5	971.6	481,231.54	655,058.43	32° 19' 20.787 N	103° 57' 54.664 W	
16,800.0	90.00	359.72	7,865.0	9,823.5	971.1	481,331.54	655,057.93	32° 19' 21.776 N	103° 57' 54.666 W	
16,900.0	90.00	359.72	7,865.0	9,923.5	970.6	481,431.53	655,057.43	32° 19' 22.766 N	103° 57' 54.667 W	
17,000.0	90.00	359.72	7,865.0	10,023.5	970.1	481,531.53	655,056.94	32° 19' 23.756 N	103° 57' 54.669 W	
17,100.0	90.00	359.72	7,865.0	10,123.5	969.6	481,631.53	655,056.44	32° 19' 24.745 N	103° 57' 54.671 W	
17,200.0	90.00	359.72	7,865.0	10,223.5	969.1	481,731.53	655,055.94	32° 19' 25.735 N	103° 57' 54.673 W	
17,300.0	90.00	359.72	7,865.0	10,323.5	968.6	481,831.53	655,055.44	32° 19' 26.724 N	103° 57' 54.675 W	
17,400.0	90.00	359.72	7,865.0	10,423.5	968.1	481,931.53	655,054.95	32° 19' 27.714 N	103° 57' 54.676 W	
17,500.0	90.00	359.72	7,865.0	10,523.5	967.6	482,031.53	655,054.45	32° 19' 28.703 N	103° 57' 54.678 W	
17,600.0	90.00	359.72	7,865.0	10,623.5	967.1	482,131.53	655,053.95	32° 19' 29.693 N	103° 57' 54.680 W	
17,700.0	90.00	359.72	7,865.0	10,723.5	966.6	482,231.52	655,053.46	32° 19' 30.683 N	103° 57' 54.682 W	
17,800.0	90.00	359.72	7,865.0	10,823.5	966.1	482,331.52	655,052.96	32° 19' 31.672 N	103° 57' 54.684 W	
17,900.0	90.00	359.72	7,865.0	10,923.5	965.6	482,431.52	655,052.46	32° 19' 32.662 N	103° 57' 54.685 W	

Planning Report - Geographic

Database:	Compass_17	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Company:	NEW MEXICO	TVD Reference:	KB @ 3030.0usft
Project:	(SP) EDDY	MD Reference:	KB @ 3030.0usft
Site:	CASSIUS FED COM	North Reference:	Grid
Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWPO		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
18,000.0	90.00	359.72	7,865.0	11,023.5	965.1	482,531.52	655,051.96	32° 19' 33.651 N	103° 57' 54.687 W	
18,100.0	90.00	359.72	7,865.0	11,123.5	964.6	482,631.52	655,051.47	32° 19' 34.641 N	103° 57' 54.689 W	
18,200.0	90.00	359.72	7,865.0	11,223.5	964.1	482,731.52	655,050.97	32° 19' 35.630 N	103° 57' 54.691 W	
18,271.5	90.00	359.72	7,865.0	11,295.0	963.8	482,803.05	655,050.61	32° 19' 36.338 N	103° 57' 54.692 W	
TD at 18271.5										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
BHL CFC 114H - hit/miss target - Shape - Point	0.00	0.00	7,865.0	11,295.0	963.8	482,803.05	655,050.61	32° 19' 36.338 N	103° 57' 54.692 W	
FTP CFC 114H - plan hits target center by 197.8usft at 7948.0usft MD (7727.3 TVD, 1008.1 N, 1014.9 E) - Point	0.00	0.00	7,865.0	866.0	1,015.6	472,374.09	655,102.45	32° 17' 53.135 N	103° 57' 54.505 W	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment	
2,000.0	2,000.0	0.0	0.0	Start Build 2.00	
2,826.9	2,815.5	76.9	90.2	Start 3856.0 hold at 2826.9 MD	
6,558.0	6,392.2	766.1	898.4	NMNM 111416 Entry at 6558.0 MD	
6,683.0	6,512.0	789.1	925.4	Start Drop -2.00	
7,509.9	7,327.5	866.0	1,015.6	Start 60.0 hold at 7509.9 MD	
7,569.9	7,387.5	866.0	1,015.6	Start DLS 12.00 TFO 359.72	
8,319.9	7,865.0	1,343.5	1,013.2	Start 9951.6 hold at 8319.9 MD	
18,271.5	7,865.0	11,295.0	963.8	TD at 18271.5	

NEW MEXICO

(SP) EDDY

CASSIUS FED COM

CASSIUS FED COM 114H

OWB

PWP0

Anticollision Report

05 June, 2024

Anticollision Report

Company:	NEW MEXICO	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Project:	(SP) EDDY	TVD Reference:	KB @ 3030.0usft
Reference Site:	CASSIUS FED COM	MD Reference:	KB @ 3030.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	Compass_17
Reference Design:	PWP0	Offset TVD Reference:	Offset Datum

Reference	PWP0		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum centre distance of 1,000.0usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date	6/5/2024		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	18,271.5	PWP0 (OWB)	MWD	OWSG_Rev2_MWD - Standard

Site Name	Reference Measure	Offset Measure	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation	Warning
Offset Well - Wellbore - Design						
CASSIUS FED COM						
CASSIUS FED COM 113H - OWB - PWP0	2,000.0	2,000.0	33.0	18.9	2.336	CC, ES, SF
CASSIUS FED COM 123H - OWB - PWP0	2,000.0	2,000.0	99.0	84.9	7.009	CC, ES
CASSIUS FED COM 123H - OWB - PWP0	2,100.0	2,097.8	101.4	86.6	6.840	SF
CASSIUS FED COM 124H - OWB - PWP0	2,000.0	2,000.0	66.0	51.9	4.673	CC, ES
CASSIUS FED COM 124H - OWB - PWP0	2,100.0	2,100.0	67.3	52.5	4.538	SF
SATURNINUS FED COM						
SATURNINUS FED COM 112H - OWB - PWP0						Out of range
SATURNINUS FED COM 121H - OWB - PWP0						Out of range
SATURNINUS FED COM 122H - OWB - PWP0						Out of range
SATURNINUS FED COM 171H - OWB - PWP0						Out of range

Offset Design CASSIUS FED COM - CASSIUS FED COM 113H - OWB - PWP0														Offset Site Error:	0.0 usft
Survey Program: 0-MWD														Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
							+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-33.0	33.0						
100.0	100.0	100.0	100.0	0.3	0.3	-90.00	0.0	-33.0	33.0	32.5	0.50	65.755			
200.0	200.0	200.0	200.0	0.6	0.6	-90.00	0.0	-33.0	33.0	31.8	1.22	27.076			
300.0	300.0	300.0	300.0	1.0	1.0	-90.00	0.0	-33.0	33.0	31.1	1.94	17.048			
400.0	400.0	400.0	400.0	1.3	1.3	-90.00	0.0	-33.0	33.0	30.3	2.65	12.440			
500.0	500.0	500.0	500.0	1.7	1.7	-90.00	0.0	-33.0	33.0	29.6	3.37	9.793			
600.0	600.0	600.0	600.0	2.0	2.0	-90.00	0.0	-33.0	33.0	28.9	4.09	8.075			
700.0	700.0	700.0	700.0	2.4	2.4	-90.00	0.0	-33.0	33.0	28.2	4.80	6.870			
800.0	800.0	800.0	800.0	2.8	2.8	-90.00	0.0	-33.0	33.0	27.5	5.52	5.978			
900.0	900.0	900.0	900.0	3.1	3.1	-90.00	0.0	-33.0	33.0	26.8	6.24	5.291			
1,000.0	1,000.0	1,000.0	1,000.0	3.5	3.5	-90.00	0.0	-33.0	33.0	26.0	6.95	4.745			
1,100.0	1,100.0	1,100.0	1,100.0	3.8	3.8	-90.00	0.0	-33.0	33.0	25.3	7.67	4.302			
1,200.0	1,200.0	1,200.0	1,200.0	4.2	4.2	-90.00	0.0	-33.0	33.0	24.6	8.39	3.934			
1,300.0	1,300.0	1,300.0	1,300.0	4.6	4.6	-90.00	0.0	-33.0	33.0	23.9	9.11	3.624			
1,400.0	1,400.0	1,400.0	1,400.0	4.9	4.9	-90.00	0.0	-33.0	33.0	23.2	9.82	3.360			
1,500.0	1,500.0	1,500.0	1,500.0	5.3	5.3	-90.00	0.0	-33.0	33.0	22.5	10.54	3.131			

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	NEW MEXICO	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Project:	(SP) EDDY	TVD Reference:	KB @ 3030.0usft
Reference Site:	CASSIUS FED COM	MD Reference:	KB @ 3030.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	Compass_17
Reference Design:	PWP0	Offset TVD Reference:	Offset Datum

Offset Design CASSIUS FED COM - CASSIUS FED COM 113H - OWB - PWP0													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
1,600.0	1,600.0	1,600.0	1,600.0	5.6	5.6	-90.00	0.0	-33.0	33.0	21.7	11.26	2.932		
1,700.0	1,700.0	1,700.0	1,700.0	6.0	6.0	-90.00	0.0	-33.0	33.0	21.0	11.97	2.756		
1,800.0	1,800.0	1,800.0	1,800.0	6.3	6.3	-90.00	0.0	-33.0	33.0	20.3	12.69	2.600		
1,900.0	1,900.0	1,900.0	1,900.0	6.7	6.7	-90.00	0.0	-33.0	33.0	19.6	13.41	2.461		
2,000.0	2,000.0	2,000.0	2,000.0	7.1	7.1	-90.00	0.0	-33.0	33.0	18.9	14.12	2.336	CC, ES, SF	
2,100.0	2,100.0	2,099.5	2,099.5	7.4	7.4	-138.75	1.6	-33.7	35.0	20.2	14.83	2.360		
2,200.0	2,199.8	2,198.8	2,198.6	7.8	7.8	-136.83	6.4	-35.7	41.0	25.5	15.53	2.641		
2,300.0	2,299.5	2,297.5	2,297.0	8.1	8.1	-134.62	14.2	-39.0	51.1	34.9	16.23	3.150		
2,400.0	2,398.7	2,395.6	2,394.3	8.5	8.5	-132.64	25.2	-43.5	65.3	48.3	16.92	3.858		
2,500.0	2,497.5	2,492.6	2,490.2	8.9	8.8	-131.02	39.0	-49.3	83.4	65.8	17.60	4.740		
2,600.0	2,595.6	2,588.5	2,584.4	9.2	9.2	-129.74	55.6	-56.2	105.5	87.3	18.28	5.773		
2,700.0	2,693.1	2,685.0	2,678.8	9.6	9.6	-129.17	74.1	-64.0	130.9	111.9	19.01	6.886		
2,800.0	2,789.6	2,781.2	2,772.8	10.0	9.9	-129.62	92.5	-71.7	158.4	138.6	19.75	8.020		
2,826.9	2,815.5	2,806.9	2,798.0	10.1	10.0	-129.85	97.4	-73.8	166.1	146.2	19.95	8.328		
2,900.0	2,885.5	2,876.8	2,866.3	10.4	10.3	-130.75	110.8	-79.4	187.5	167.0	20.50	9.144		
3,000.0	2,981.4	2,972.3	2,959.8	10.9	10.7	-131.69	129.2	-87.0	216.7	195.5	21.27	10.191		
3,100.0	3,077.3	3,067.9	3,053.3	11.3	11.1	-132.41	147.5	-94.7	246.0	224.0	22.04	11.161		
3,200.0	3,173.1	3,163.5	3,146.8	11.8	11.5	-132.97	165.8	-102.4	275.3	252.5	22.83	12.061		
3,300.0	3,269.0	3,259.0	3,240.3	12.3	11.9	-133.43	184.2	-110.0	304.7	281.1	23.62	12.897		
3,400.0	3,364.9	3,354.6	3,333.8	12.8	12.3	-133.81	202.5	-117.7	334.0	309.6	24.43	13.675		
3,500.0	3,460.7	3,450.2	3,427.2	13.2	12.7	-134.12	220.8	-125.4	363.4	338.2	25.24	14.398		
3,600.0	3,556.6	3,545.8	3,520.7	13.7	13.1	-134.39	239.2	-133.0	392.8	366.7	26.06	15.073		
3,700.0	3,652.4	3,641.3	3,614.2	14.2	13.6	-134.62	257.5	-140.7	422.2	395.3	26.88	15.704		
3,800.0	3,748.3	3,736.9	3,707.7	14.7	14.0	-134.82	275.8	-148.3	451.5	423.8	27.71	16.293		
3,900.0	3,844.2	3,832.5	3,801.2	15.3	14.4	-135.00	294.2	-156.0	480.9	452.4	28.55	16.845		
4,000.0	3,940.0	3,928.1	3,894.7	15.8	14.8	-135.15	312.5	-163.7	510.3	480.9	29.39	17.363		
4,100.0	4,035.9	4,023.6	3,988.1	16.3	15.2	-135.29	330.8	-171.3	539.7	509.5	30.24	17.850		
4,200.0	4,131.8	4,119.2	4,081.6	16.8	15.7	-135.42	349.2	-179.0	569.1	538.0	31.09	18.308		
4,300.0	4,227.6	4,214.8	4,175.1	17.4	16.1	-135.53	367.5	-186.7	598.5	566.6	31.94	18.739		
4,400.0	4,323.5	4,310.4	4,268.6	17.9	16.5	-135.63	385.8	-194.3	627.9	595.1	32.80	19.145		
4,500.0	4,419.3	4,405.9	4,362.1	18.4	17.0	-135.72	404.2	-202.0	657.4	623.7	33.66	19.529		
4,600.0	4,515.2	4,501.5	4,455.6	19.0	17.4	-135.81	422.5	-209.7	686.8	652.2	34.52	19.893		
4,700.0	4,611.1	4,597.1	4,549.1	19.5	17.8	-135.89	440.8	-217.3	716.2	680.8	35.39	20.236		
4,800.0	4,706.9	4,692.6	4,642.5	20.0	18.3	-135.96	459.2	-225.0	745.6	709.3	36.26	20.562		
4,900.0	4,802.8	4,788.2	4,736.0	20.6	18.7	-136.03	477.5	-232.7	775.0	737.9	37.13	20.872		
5,000.0	4,898.7	4,883.8	4,829.5	21.1	19.2	-136.09	495.8	-240.3	804.4	766.4	38.01	21.165		
5,100.0	4,994.5	4,979.4	4,923.0	21.7	19.6	-136.14	514.2	-248.0	833.8	794.9	38.88	21.445		
5,200.0	5,090.4	5,074.9	5,016.5	22.2	20.0	-136.20	532.5	-255.7	863.2	823.5	39.76	21.711		
5,300.0	5,186.2	5,170.5	5,110.0	22.8	20.5	-136.25	550.8	-263.3	892.6	852.0	40.64	21.964		
5,400.0	5,282.1	5,266.1	5,203.5	23.3	20.9	-136.29	569.2	-271.0	922.1	880.5	41.52	22.206		
5,500.0	5,378.0	5,361.7	5,296.9	23.9	21.4	-136.34	587.5	-278.7	951.5	909.1	42.41	22.437		
5,600.0	5,473.8	5,457.2	5,390.4	24.4	21.8	-136.38	605.8	-286.3	980.9	937.6	43.29	22.658		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	NEW MEXICO	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Project:	(SP) EDDY	TVD Reference:	KB @ 3030.0usft
Reference Site:	CASSIUS FED COM	MD Reference:	KB @ 3030.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	Compass_17
Reference Design:	PWP0	Offset TVD Reference:	Offset Datum

Offset Design CASSIUS FED COM - CASSIUS FED COM 123H - OWB - PWP0													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-99.0	99.0					
100.0	100.0	100.0	100.0	0.3	0.3	-90.00	0.0	-99.0	99.0	98.5	0.50	197.266		
200.0	200.0	200.0	200.0	0.6	0.6	-90.00	0.0	-99.0	99.0	97.8	1.22	81.227		
300.0	300.0	300.0	300.0	1.0	1.0	-90.00	0.0	-99.0	99.0	97.1	1.94	51.143		
400.0	400.0	400.0	400.0	1.3	1.3	-90.00	0.0	-99.0	99.0	96.3	2.65	37.321		
500.0	500.0	500.0	500.0	1.7	1.7	-90.00	0.0	-99.0	99.0	95.6	3.37	29.380		
600.0	600.0	600.0	600.0	2.0	2.0	-90.00	0.0	-99.0	99.0	94.9	4.09	24.226		
700.0	700.0	700.0	700.0	2.4	2.4	-90.00	0.0	-99.0	99.0	94.2	4.80	20.610		
800.0	800.0	800.0	800.0	2.8	2.8	-90.00	0.0	-99.0	99.0	93.5	5.52	17.933		
900.0	900.0	900.0	900.0	3.1	3.1	-90.00	0.0	-99.0	99.0	92.8	6.24	15.872		
1,000.0	1,000.0	1,000.0	1,000.0	3.5	3.5	-90.00	0.0	-99.0	99.0	92.0	6.95	14.236		
1,100.0	1,100.0	1,100.0	1,100.0	3.8	3.8	-90.00	0.0	-99.0	99.0	91.3	7.67	12.905		
1,200.0	1,200.0	1,200.0	1,200.0	4.2	4.2	-90.00	0.0	-99.0	99.0	90.6	8.39	11.802		
1,300.0	1,300.0	1,300.0	1,300.0	4.6	4.6	-90.00	0.0	-99.0	99.0	89.9	9.11	10.873		
1,400.0	1,400.0	1,400.0	1,400.0	4.9	4.9	-90.00	0.0	-99.0	99.0	89.2	9.82	10.079		
1,500.0	1,500.0	1,500.0	1,500.0	5.3	5.3	-90.00	0.0	-99.0	99.0	88.5	10.54	9.394		
1,600.0	1,600.0	1,600.0	1,600.0	5.6	5.6	-90.00	0.0	-99.0	99.0	87.7	11.26	8.795		
1,700.0	1,700.0	1,700.0	1,700.0	6.0	6.0	-90.00	0.0	-99.0	99.0	87.0	11.97	8.269		
1,800.0	1,800.0	1,800.0	1,800.0	6.3	6.3	-90.00	0.0	-99.0	99.0	86.3	12.69	7.801		
1,900.0	1,900.0	1,900.0	1,900.0	6.7	6.7	-90.00	0.0	-99.0	99.0	85.6	13.41	7.384		
2,000.0	2,000.0	2,000.0	2,000.0	7.1	7.1	-90.00	0.0	-99.0	99.0	84.9	14.12	7.009 CC, ES		
2,100.0	2,100.0	2,097.8	2,097.8	7.4	7.4	-139.40	1.3	-100.0	101.4	86.6	14.82	6.840 SF		
2,200.0	2,199.8	2,195.3	2,195.2	7.8	7.8	-139.01	5.2	-103.2	108.6	93.1	15.51	6.998		
2,300.0	2,299.5	2,292.2	2,291.7	8.1	8.1	-138.44	11.6	-108.3	120.5	104.3	16.19	7.441		
2,400.0	2,398.7	2,388.0	2,386.8	8.5	8.4	-137.79	20.5	-115.4	137.1	120.3	16.86	8.132		
2,500.0	2,497.5	2,482.6	2,480.3	8.9	8.8	-137.12	31.7	-124.3	158.4	140.9	17.52	9.040		
2,600.0	2,595.6	2,575.6	2,571.7	9.2	9.1	-136.45	45.0	-135.0	184.2	166.1	18.18	10.136		
2,700.0	2,693.1	2,670.0	2,664.1	9.6	9.5	-135.98	60.3	-147.2	214.0	195.1	18.87	11.339		
2,800.0	2,789.6	2,764.6	2,756.7	10.0	9.9	-136.05	75.6	-159.5	246.2	226.6	19.59	12.566		
2,826.9	2,815.5	2,790.0	2,781.5	10.1	10.0	-136.14	79.8	-162.8	255.2	235.5	19.79	12.900		
2,900.0	2,885.5	2,858.6	2,848.6	10.4	10.3	-136.72	90.9	-171.7	280.1	259.8	20.32	13.786		
3,000.0	2,981.4	2,952.6	2,940.5	10.9	10.6	-137.36	106.2	-183.9	314.2	293.2	21.06	14.923		
3,100.0	3,077.3	3,046.5	3,032.4	11.3	11.0	-137.88	121.4	-196.1	348.3	326.5	21.80	15.977		
3,200.0	3,173.1	3,140.5	3,124.3	11.8	11.4	-138.30	136.7	-208.3	382.5	359.9	22.56	16.954		
3,300.0	3,269.0	3,234.5	3,216.2	12.3	11.8	-138.66	151.9	-220.5	416.6	393.3	23.33	17.863		
3,400.0	3,364.9	3,328.4	3,308.1	12.8	12.2	-138.96	167.2	-232.6	450.8	426.7	24.10	18.708		
3,500.0	3,460.7	3,422.4	3,400.0	13.2	12.6	-139.22	182.5	-244.8	485.0	460.1	24.88	19.495		
3,600.0	3,556.6	3,516.3	3,491.9	13.7	13.0	-139.44	197.7	-257.0	519.2	493.5	25.66	20.230		
3,700.0	3,652.4	3,610.3	3,583.8	14.2	13.4	-139.64	213.0	-269.2	553.4	526.9	26.46	20.917		
3,800.0	3,748.3	3,704.2	3,675.7	14.7	13.9	-139.82	228.2	-281.4	587.6	560.3	27.25	21.560		
3,900.0	3,844.2	3,798.2	3,767.6	15.3	14.3	-139.97	243.5	-293.6	621.8	593.7	28.06	22.163		
4,000.0	3,940.0	3,892.1	3,859.5	15.8	14.7	-140.11	258.7	-305.8	656.0	627.1	28.86	22.729		
4,100.0	4,035.9	3,986.1	3,951.4	16.3	15.1	-140.23	274.0	-318.0	690.2	660.5	29.67	23.260		
4,200.0	4,131.8	4,080.1	4,043.3	16.8	15.5	-140.35	289.3	-330.2	724.4	693.9	30.49	23.761		
4,300.0	4,227.6	4,174.0	4,135.2	17.4	16.0	-140.45	304.5	-342.4	758.6	727.3	31.31	24.233		
4,400.0	4,323.5	4,268.0	4,227.1	17.9	16.4	-140.55	319.8	-354.6	792.9	760.7	32.13	24.678		
4,500.0	4,419.3	4,361.9	4,319.0	18.4	16.8	-140.63	335.0	-366.8	827.1	794.1	32.95	25.099		
4,600.0	4,515.2	4,455.9	4,410.9	19.0	17.2	-140.71	350.3	-379.0	861.3	827.5	33.78	25.497		
4,700.0	4,611.1	4,549.8	4,502.8	19.5	17.7	-140.78	365.6	-391.2	895.5	860.9	34.61	25.874		
4,800.0	4,706.9	4,643.8	4,594.8	20.0	18.1	-140.85	380.8	-403.4	929.8	894.3	35.44	26.232		
4,900.0	4,802.8	4,737.7	4,686.7	20.6	18.5	-140.92	396.1	-415.6	964.0	927.7	36.28	26.572		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	NEW MEXICO	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Project:	(SP) EDDY	TVD Reference:	KB @ 3030.0usft
Reference Site:	CASSIUS FED COM	MD Reference:	KB @ 3030.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	Compass_17
Reference Design:	PWP0	Offset TVD Reference:	Offset Datum

Offset Design	CASSIUS FED COM - CASSIUS FED COM 123H - OWB - PWP0											Offset Site Error:	0.0 usft
Survey Program:	0-MWD											Offset Well Error:	0.0 usft
Reference	Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Rule Assigned:		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)		Offset (usft)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor
5,000.0	4,898.7	4,831.7	4,778.6	21.1	19.0	-140.97	411.3	-427.8	998.2	961.1	37.12	26.895	

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	NEW MEXICO	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Project:	(SP) EDDY	TVD Reference:	KB @ 3030.0usft
Reference Site:	CASSIUS FED COM	MD Reference:	KB @ 3030.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	Compass_17
Reference Design:	PWP0	Offset TVD Reference:	Offset Datum

Offset Design CASSIUS FED COM - CASSIUS FED COM 124H - OWB - PWP0													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.0	0.0	0.0	0.0	0.0	0.0	-90.00	0.0	-66.0	66.0	65.5	0.50	131.511		
100.0	100.0	100.0	100.0	0.3	0.3	-90.00	0.0	-66.0	66.0	64.8	1.22	54.151		
200.0	200.0	200.0	200.0	0.6	0.6	-90.00	0.0	-66.0	66.0	64.1	1.94	34.095		
300.0	300.0	300.0	300.0	1.0	1.0	-90.00	0.0	-66.0	66.0	63.3	2.65	24.880		
400.0	400.0	400.0	400.0	1.3	1.3	-90.00	0.0	-66.0	66.0	62.6	3.37	19.587		
500.0	500.0	500.0	500.0	1.7	1.7	-90.00	0.0	-66.0	66.0	61.9	4.09	16.150		
600.0	600.0	600.0	600.0	2.0	2.0	-90.00	0.0	-66.0	66.0	61.2	4.80	13.740		
700.0	700.0	700.0	700.0	2.4	2.4	-90.00	0.0	-66.0	66.0	60.5	5.52	11.956		
800.0	800.0	800.0	800.0	2.8	2.8	-90.00	0.0	-66.0	66.0	59.8	6.24	10.581		
900.0	900.0	900.0	900.0	3.1	3.1	-90.00	0.0	-66.0	66.0	59.0	6.95	9.490		
1,000.0	1,000.0	1,000.0	1,000.0	3.5	3.5	-90.00	0.0	-66.0	66.0	58.3	7.67	8.604		
1,100.0	1,100.0	1,100.0	1,100.0	3.8	3.8	-90.00	0.0	-66.0	66.0	57.6	8.39	7.868		
1,200.0	1,200.0	1,200.0	1,200.0	4.2	4.2	-90.00	0.0	-66.0	66.0	56.9	9.11	7.249		
1,300.0	1,300.0	1,300.0	1,300.0	4.6	4.6	-90.00	0.0	-66.0	66.0	56.2	9.82	6.720		
1,400.0	1,400.0	1,400.0	1,400.0	4.9	4.9	-90.00	0.0	-66.0	66.0	55.5	10.54	6.262		
1,500.0	1,500.0	1,500.0	1,500.0	5.3	5.3	-90.00	0.0	-66.0	66.0	54.7	11.26	5.864		
1,600.0	1,600.0	1,600.0	1,600.0	5.6	5.6	-90.00	0.0	-66.0	66.0	54.0	11.97	5.512		
1,700.0	1,700.0	1,700.0	1,700.0	6.0	6.0	-90.00	0.0	-66.0	66.0	53.3	12.69	5.201		
1,800.0	1,800.0	1,800.0	1,800.0	6.3	6.3	-90.00	0.0	-66.0	66.0	52.6	13.41	4.923		
1,900.0	1,900.0	1,900.0	1,900.0	6.7	6.7	-90.00	0.0	-66.0	66.0	51.9	14.12	4.673 CC, ES		
2,000.0	2,000.0	2,000.0	2,000.0	7.1	7.1	-90.00	0.0	-66.0	66.0	51.2	14.84	4.538 SF		
2,100.0	2,100.0	2,100.0	2,100.0	7.4	7.4	-140.49	0.0	-66.0	67.3	50.5	15.55	4.596		
2,200.0	2,199.8	2,199.8	2,199.8	7.8	7.8	-143.11	0.0	-66.0	71.5	49.8	16.26	4.763		
2,300.0	2,299.5	2,301.3	2,301.2	8.1	8.1	-145.94	1.5	-65.0	77.4	49.1	16.96	4.961		
2,400.0	2,398.7	2,402.9	2,402.8	8.5	8.5	-147.83	5.9	-61.9	84.1	48.4	17.65	5.178		
2,500.0	2,497.5	2,504.8	2,504.2	8.9	8.9	-148.95	13.3	-56.8	91.4	47.7	18.34	5.410		
2,600.0	2,595.6	2,606.9	2,605.5	9.2	9.2	-149.44	23.7	-49.6	99.2	47.0	19.03	5.651		
2,700.0	2,693.1	2,709.1	2,706.4	9.6	9.6	-149.44	37.1	-40.4	107.5	46.3	19.72	5.899		
2,800.0	2,789.6	2,811.2	2,806.6	10.0	10.0	-149.04	53.5	-29.1	116.3	45.6	19.92	5.972		
2,826.9	2,815.5	2,838.0	2,832.8	10.1	10.1	-148.96	58.1	-26.0	119.0	44.9	20.46	6.176		
2,900.0	2,885.5	2,910.7	2,903.9	10.4	10.4	-148.90	70.5	-17.4	126.4	44.2	21.21	6.435		
3,000.0	2,981.4	3,010.2	3,001.2	10.9	10.8	-148.83	87.5	-5.7	136.5	43.5	21.97	6.672		
3,100.0	3,077.3	3,109.7	3,098.5	11.3	11.2	-148.77	104.6	6.1	146.6	42.8	22.74	6.892		
3,200.0	3,173.1	3,209.2	3,195.8	11.8	11.6	-148.72	121.6	17.8	156.7	42.1	23.52	7.094		
3,300.0	3,269.0	3,308.7	3,293.2	12.3	12.0	-148.68	138.6	29.6	166.9	41.4	24.31	7.280		
3,400.0	3,364.9	3,408.1	3,390.5	12.8	12.4	-148.64	155.6	41.3	177.0	40.7	25.11	7.453		
3,500.0	3,460.7	3,507.6	3,487.8	13.2	12.8	-148.61	172.7	53.0	187.1	40.0	25.91	7.614		
3,600.0	3,556.6	3,607.1	3,585.1	13.7	13.2	-148.57	189.7	64.8	197.3	39.3	26.72	7.763		
3,700.0	3,652.4	3,706.6	3,682.4	14.2	13.6	-148.55	206.7	76.5	207.4	38.6	27.53	7.901		
3,800.0	3,748.3	3,806.1	3,779.7	14.7	14.1	-148.52	223.8	88.3	217.5	37.9	28.35	8.031		
3,900.0	3,844.2	3,905.6	3,877.0	15.3	14.5	-148.50	240.8	100.0	227.6	37.2	29.17	8.151		
4,000.0	3,940.0	4,005.1	3,974.3	15.8	14.9	-148.48	257.8	111.7	237.8	36.5	30.00	8.264		
4,100.0	4,035.9	4,104.5	4,071.7	16.3	15.4	-148.46	274.8	123.5	247.9	35.8	30.83	8.370		
4,200.0	4,131.8	4,204.0	4,169.0	16.8	15.8	-148.44	291.9	135.2	258.0	35.1	31.66	8.470		
4,300.0	4,227.6	4,303.5	4,266.3	17.4	16.3	-148.42	308.9	147.0	268.2	34.4	32.50	8.563		
4,400.0	4,323.5	4,403.0	4,363.6	17.9	16.7	-148.41	325.9	158.7	278.3	33.7	33.34	8.651		
4,500.0	4,419.3	4,502.5	4,460.9	18.4	17.1	-148.39	343.0	170.4	288.4	33.0	34.18	8.734		
4,600.0	4,515.2	4,602.0	4,558.2	19.0	17.6	-148.38	360.0	182.2	298.5	32.3	35.03	8.812		
4,700.0	4,611.1	4,701.5	4,655.5	19.5	18.0	-148.37	377.0	193.9	308.7	31.6	35.88	8.886		
4,800.0	4,706.9	4,800.9	4,752.8	20.0	18.5	-148.35	394.1	205.7	318.8	30.9	36.73	8.956		
4,900.0	4,802.8	4,900.4	4,850.1	20.6	18.9	-148.34	411.1	217.4	328.9	30.2				

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	NEW MEXICO	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Project:	(SP) EDDY	TVD Reference:	KB @ 3030.0usft
Reference Site:	CASSIUS FED COM	MD Reference:	KB @ 3030.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	Compass_17
Reference Design:	PWP0	Offset TVD Reference:	Offset Datum

Offset Design CASSIUS FED COM - CASSIUS FED COM 124H - OWB - PWP0													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
5,000.0	4,898.7	4,999.9	4,947.5	21.1	19.4	-148.33	428.1	229.1	339.1	301.5	37.58	9.022		
5,100.0	4,994.5	5,099.4	5,044.8	21.7	19.9	-148.32	445.1	240.9	349.2	310.7	38.43	9.085		
5,200.0	5,090.4	5,198.9	5,142.1	22.2	20.3	-148.31	462.2	252.6	359.3	320.0	39.29	9.145		
5,300.0	5,186.2	5,298.4	5,239.4	22.8	20.8	-148.30	479.2	264.4	369.4	329.3	40.15	9.202		
5,400.0	5,282.1	5,397.9	5,336.7	23.3	21.2	-148.30	496.2	276.1	379.6	338.6	41.01	9.256		
5,500.0	5,378.0	5,497.3	5,434.0	23.9	21.7	-148.29	513.3	287.8	389.7	347.8	41.87	9.307		
5,600.0	5,473.8	5,596.8	5,531.3	24.4	22.1	-148.28	530.3	299.6	399.8	357.1	42.73	9.357		
5,700.0	5,569.7	5,696.3	5,628.6	25.0	22.6	-148.27	547.3	311.3	410.0	366.4	43.60	9.403		
5,800.0	5,665.6	5,795.8	5,726.0	25.5	23.1	-148.27	564.4	323.1	420.1	375.6	44.46	9.448		
5,900.0	5,761.4	5,895.3	5,823.3	26.1	23.5	-148.26	581.4	334.8	430.2	384.9	45.33	9.491		
6,000.0	5,857.3	5,994.8	5,920.6	26.7	24.0	-148.26	598.4	346.5	440.3	394.1	46.20	9.532		
6,100.0	5,953.1	6,094.3	6,017.9	27.2	24.5	-148.25	615.4	358.3	450.5	403.4	47.06	9.571		
6,200.0	6,049.0	6,193.7	6,115.2	27.8	24.9	-148.24	632.5	370.0	460.6	412.7	47.93	9.609		
6,300.0	6,144.9	6,293.2	6,212.5	28.3	25.4	-148.24	649.5	381.8	470.7	421.9	48.81	9.645		
6,400.0	6,240.7	6,392.7	6,309.8	28.9	25.8	-148.23	666.5	393.5	480.9	431.2	49.68	9.680		
6,500.0	6,336.6	6,492.2	6,407.1	29.5	26.3	-148.23	683.6	405.2	491.0	440.4	50.55	9.713		
6,600.0	6,432.5	6,591.7	6,504.4	30.0	26.8	-148.22	700.6	417.0	501.1	449.7	51.42	9.745		
6,683.0	6,512.0	6,674.2	6,585.2	30.5	27.2	-148.22	714.7	426.7	509.5	457.4	52.15	9.771		
6,700.0	6,528.3	6,691.2	6,601.8	30.6	27.2	-148.23	717.6	428.7	511.2	458.9	52.30	9.775		
6,800.0	6,624.8	6,790.8	6,699.2	31.1	27.7	-148.18	734.7	440.5	519.3	466.2	53.18	9.766		
6,900.0	6,722.2	6,890.6	6,796.9	31.6	28.2	-147.90	751.8	452.3	524.5	470.5	54.08	9.699		
7,000.0	6,820.3	6,990.5	6,894.5	32.1	28.7	-147.39	768.9	464.0	526.8	471.8	55.00	9.579		
7,100.0	6,919.0	7,090.2	6,992.1	32.5	29.1	-146.64	785.9	475.8	526.2	470.3	55.93	9.408		
7,200.0	7,018.2	7,189.8	7,089.5	32.9	29.6	-145.65	803.0	487.6	522.8	465.9	56.89	9.191		
7,300.0	7,117.8	7,285.3	7,183.0	33.3	30.0	-144.47	819.2	498.7	516.9	459.0	57.84	8.936		
7,400.0	7,217.6	7,374.4	7,270.6	33.6	30.4	-143.30	832.5	507.9	509.9	451.1	58.73	8.681		
7,509.9	7,327.5	7,472.7	7,367.8	33.9	30.9	-92.46	844.6	516.3	501.4	441.8	59.66	8.405		
7,569.9	7,387.5	7,526.6	7,421.2	34.1	31.1	-91.85	850.1	520.0	497.0	436.8	60.14	8.264		
7,575.0	7,392.6	7,531.2	7,425.8	34.1	31.1	-91.56	850.5	520.3	496.6	436.5	60.18	8.253		
7,600.0	7,417.6	7,553.8	7,448.3	34.2	31.2	-91.61	852.5	521.7	495.1	434.7	60.36	8.202		
7,625.0	7,442.5	7,576.4	7,470.8	34.3	31.3	-91.81	854.4	523.0	493.6	433.1	60.52	8.157		
7,650.0	7,467.2	7,600.0	7,494.3	34.4	31.4	-92.15	856.2	524.3	492.4	431.7	60.67	8.116		
7,675.0	7,491.7	7,621.5	7,515.7	34.5	31.4	-92.60	857.7	525.3	491.3	430.5	60.77	8.084		
7,700.0	7,516.0	7,643.7	7,537.8	34.6	31.5	-93.18	859.1	526.3	490.4	429.5	60.86	8.057		
7,725.0	7,539.9	7,665.7	7,559.7	34.7	31.6	-93.88	860.3	527.1	489.7	428.8	60.93	8.038		
7,750.0	7,563.4	7,687.2	7,581.3	34.8	31.7	-94.67	861.4	527.9	489.4	428.4	60.97	8.027		
7,764.2	7,576.5	7,700.0	7,594.0	34.8	31.7	-95.18	862.0	528.3	489.4	428.4	60.99	8.023		
7,775.0	7,586.3	7,708.3	7,602.3	34.9	31.7	-95.54	862.4	528.5	489.4	428.4	60.99	8.024		
7,800.0	7,608.8	7,728.9	7,622.8	35.0	31.8	-96.46	863.2	529.1	489.8	428.9	60.98	8.033		
7,825.0	7,630.6	7,748.8	7,642.8	35.2	31.9	-97.42	863.8	529.5	490.8	429.8	60.95	8.052		
7,850.0	7,651.8	7,768.1	7,662.0	35.3	31.9	-98.38	864.4	529.9	492.2	431.3	60.89	8.084		
7,875.0	7,672.2	7,786.6	7,680.5	35.4	32.0	-99.32	864.8	530.2	494.4	433.5	60.81	8.129		
7,900.0	7,691.9	7,804.3	7,698.2	35.6	32.1	-100.21	865.1	530.4	497.2	436.5	60.72	8.189		
7,925.0	7,710.8	7,821.1	7,715.0	35.7	32.1	-101.02	865.3	530.5	500.8	440.2	60.60	8.265		
7,950.0	7,728.7	7,837.0	7,731.0	35.9	32.2	-101.73	865.4	530.6	505.3	444.9	60.47	8.357		
7,975.0	7,745.7	7,853.5	7,747.4	36.0	32.2	-102.45	865.4	530.6	510.7	450.4	60.35	8.463		
8,000.0	7,761.7	7,867.8	7,761.7	36.2	32.3	-102.92	865.4	530.6	517.0	456.8	60.21	8.588		
8,025.0	7,776.7	7,882.8	7,776.7	36.4	32.3	-103.38	865.4	530.6	524.3	464.2	60.09	8.726		
8,050.0	7,790.7	7,896.8	7,790.7	36.5	32.4	-103.65	865.4	530.6	532.5	472.6	59.97	8.881		
8,075.0	7,803.5	7,909.6	7,803.5	36.7	32.4	-103.72	865.4	530.6	541.8	481.9	59.85	9.052		
8,100.0	7,815.2	7,921.3	7,815.2	36.9	32.4	-103.57	865.4	530.6	551.9	492.2	59.74	9.239		

CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	NEW MEXICO	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Project:	(SP) EDDY	TVD Reference:	KB @ 3030.0usft
Reference Site:	CASSIUS FED COM	MD Reference:	KB @ 3030.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	Compass_17
Reference Design:	PWP0	Offset TVD Reference:	Offset Datum

Offset Design CASSIUS FED COM - CASSIUS FED COM 124H - OWB - PWP0													Offset Site Error:	0.0 usft
Survey Program: 0-MWD													Offset Well Error:	0.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
		Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
8,125.0	7,825.7	7,931.8	7,825.7	37.1	32.5	-103.18	865.4	530.6	563.1	503.5	59.63	9.443		
8,150.0	7,835.1	7,941.1	7,835.1	37.3	32.5	-102.53	865.4	530.6	575.3	515.7	59.53	9.663		
8,175.0	7,843.1	7,949.2	7,843.1	37.5	32.5	-101.60	865.4	530.6	588.3	528.9	59.44	9.898		
8,200.0	7,850.0	7,956.1	7,850.0	37.6	32.5	-100.37	865.4	530.6	602.2	542.9	59.35	10.147		
8,225.0	7,855.6	7,961.6	7,855.6	37.8	32.5	-98.83	865.4	530.6	617.0	557.7	59.28	10.409		
8,250.0	7,859.9	7,965.9	7,859.9	38.0	32.6	-96.96	865.4	530.6	632.5	573.3	59.20	10.684		
8,275.0	7,862.9	7,968.9	7,862.9	38.2	32.6	-94.77	865.4	530.6	648.7	589.6	59.14	10.970		
8,300.0	7,864.5	7,970.6	7,864.5	38.4	32.6	-92.24	865.4	530.6	665.6	606.5	59.07	11.267		
8,319.9	7,865.0	7,971.0	7,865.0	38.6	32.6	-90.00	865.4	530.6	679.3	620.3	59.02	11.509		
8,400.0	7,865.0	7,971.0	7,865.0	39.3	32.6	-90.00	865.4	530.6	737.6	678.8	58.89	12.525		
8,500.0	7,865.0	7,971.0	7,865.0	40.2	32.6	-90.00	865.4	530.6	815.6	756.8	58.84	13.861		
8,600.0	7,865.0	7,971.0	7,865.0	41.1	32.6	-90.00	865.4	530.6	898.0	839.1	58.87	15.253		
8,700.0	7,865.0	7,971.0	7,865.0	42.1	32.6	-90.00	865.4	530.6	983.7	924.7	58.95	16.686		

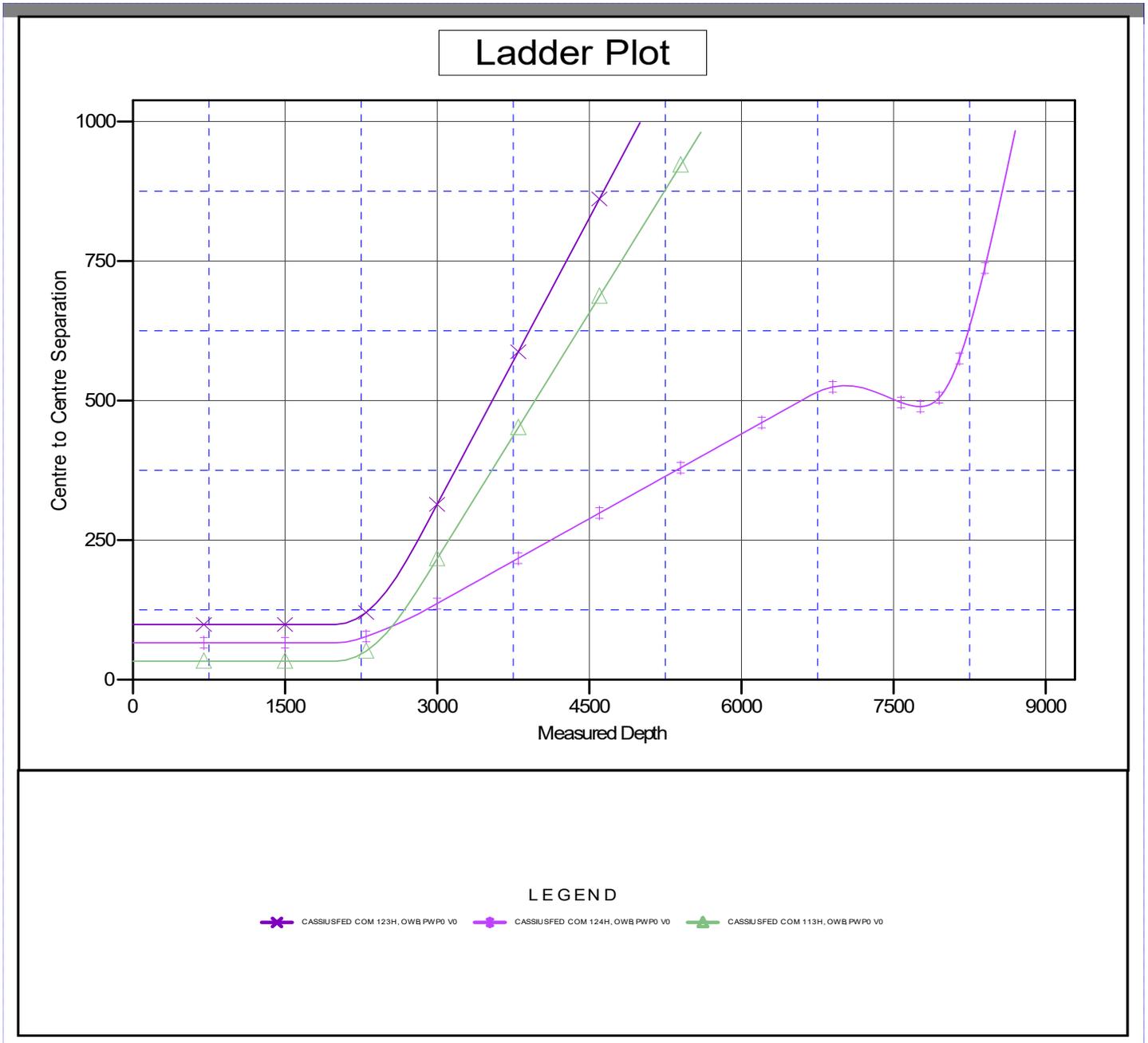
CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	NEW MEXICO	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Project:	(SP) EDDY	TVD Reference:	KB @ 3030.0usft
Reference Site:	CASSIUS FED COM	MD Reference:	KB @ 3030.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	Compass_17
Reference Design:	PWP0	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3030.0usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: CASSIUS FED COM 114H
 Coordinate System is US State Plane 1983, New Mexico Eastern Zone
 Grid Convergence at Surface is: 0.19°



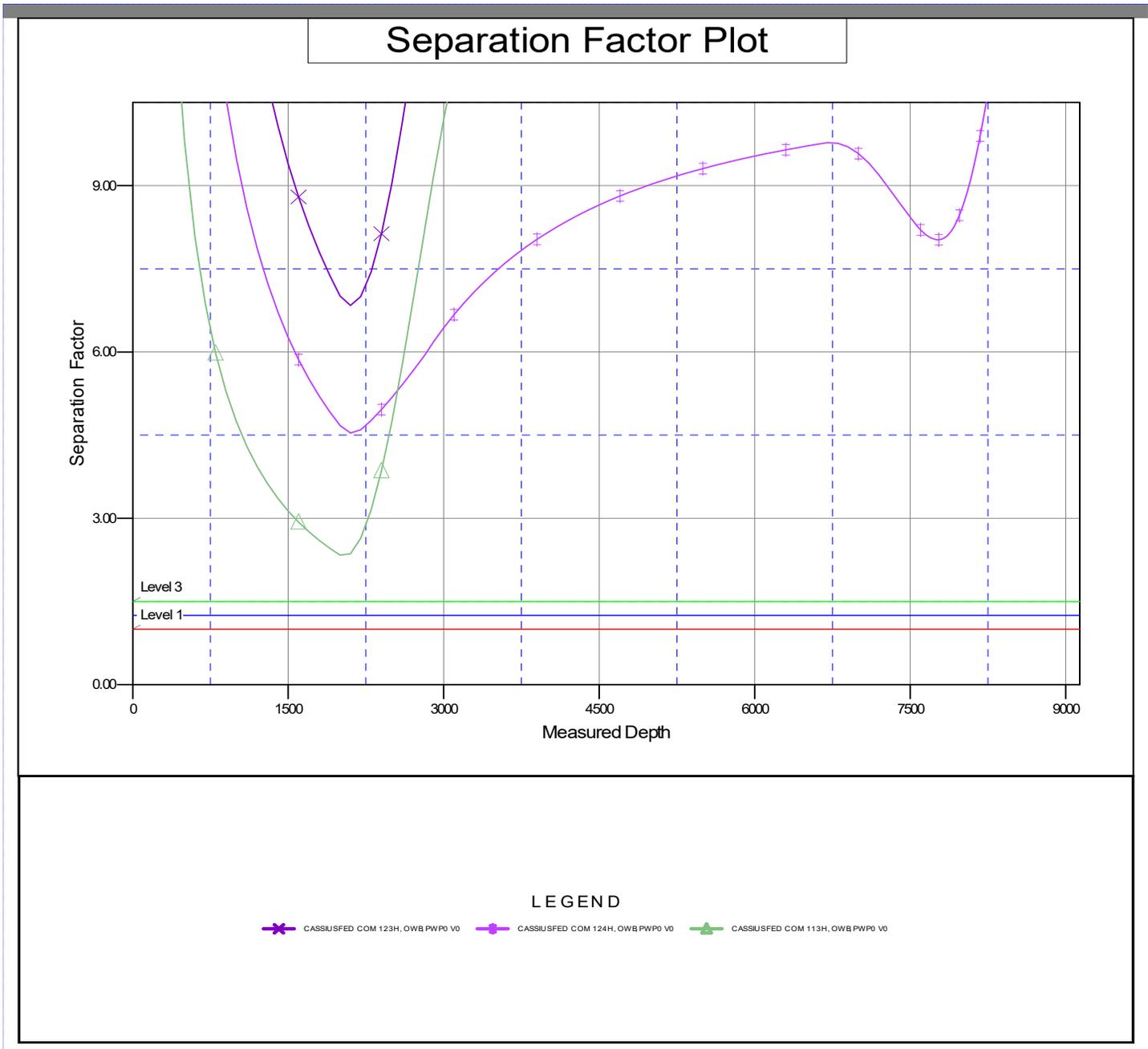
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	NEW MEXICO	Local Co-ordinate Reference	Well CASSIUS FED COM 114H
Project:	(SP) EDDY	TVD Reference:	KB @ 3030.0usft
Reference Site:	CASSIUS FED COM	MD Reference:	KB @ 3030.0usft
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	CASSIUS FED COM 114H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	Compass_17
Reference Design:	PWP0	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3030.0usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: CASSIUS FED COM 114H
 Coordinate System is US State Plane 1983, New Mexico Eastern Zone
 Grid Convergence at Surface is: 0.19°



CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Permian Resources Multi-Well Pad Batch Drilling Procedure

Surface Casing - PR intends to Batch set all 13-3/8" casing to a depth approved in the APD. 17-1/2" Surface Holes will be batch drilled by a rig. Appropriate notifications will be made prior to spudding the well, running and cementing casing and prior to skidding to the rig to the next well on pad.

1. Drill 17-1/2" Surface hole to Approved Depth with Rig and perform wellbore cleanup cycles. Trip out and rack back drilling BHA.
2. Run and land 13-3/8" 54.5# J55 BTC casing see Illustration 1-1 Below to depth approved in APD.
3. Set packoff and test to 5k psi
4. Offline Cement
5. Install wellhead with pressure gauge and nightcap. Nightcap is shown on final wellhead Stack up Illustration #2-2.
6. Skid Rig to adjacent well to drill Surface hole.
7. Surface casing test will be performed by the rig in order to allow ample time for Cement to develop 500psi compressive strength. Casing test to 0.22 psi/ft or 1500 psi whichever is

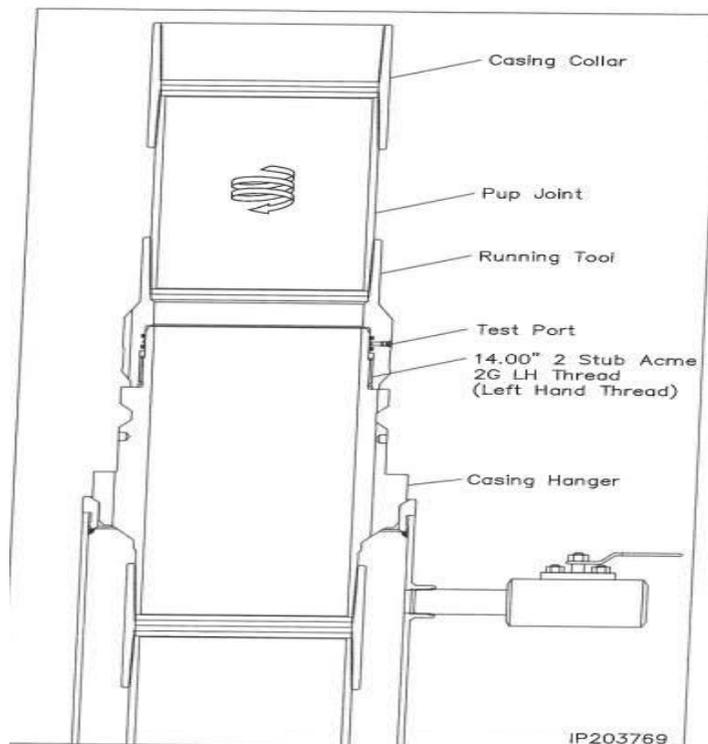


Illustration 1-1

Intermediate Casing – PR intends to Batch set all intermediate casing strings to a depth approved in the APD, typically set into Lamar. 12-1/4" Intermediate Holes will be batch drilled by the rig. Appropriate notifications will be made prior Testing BOPE, and prior to running/cementing all casing strings.

1. Rig will remove the nightcap and install and test BOPE.
2. Test Surface casing per COA WOC timing (.22 psi/ft or 1500 psi whichever is greater) - not to exceed 70% casing burst. Cement must have achieved 500psi compressive strength prior to test.
3. Install wear bushing then drill out 13-3/8" shoe-track plus 20' and conduct FIT to minimum of the MW equivalent anticipated to control the formation pressure to the next casing point.
4. Drill Intermediate hole to approved casing point. Trip out of hole with BHA to run Casing.
5. Remove wear bushing then run and land Intermediate Casing with mandrel hanger in wellhead.
6. Cement casing to surface with floats holding.
7. Washout stack then run wash tool in wellhead and wash hanger and pack-off setting area.
8. Install pack-off and test void to 5,000 psi for 15 minutes. Nightcap shown on final wellhead stack up illustration 2-2 on page 3.
9. Test casing per COA WOC timing (.22 psi/ft or 1500 psi whichever is greater) - not to exceed 70% casing burst. Cement must have achieved 500psi compressive strength prior to test.

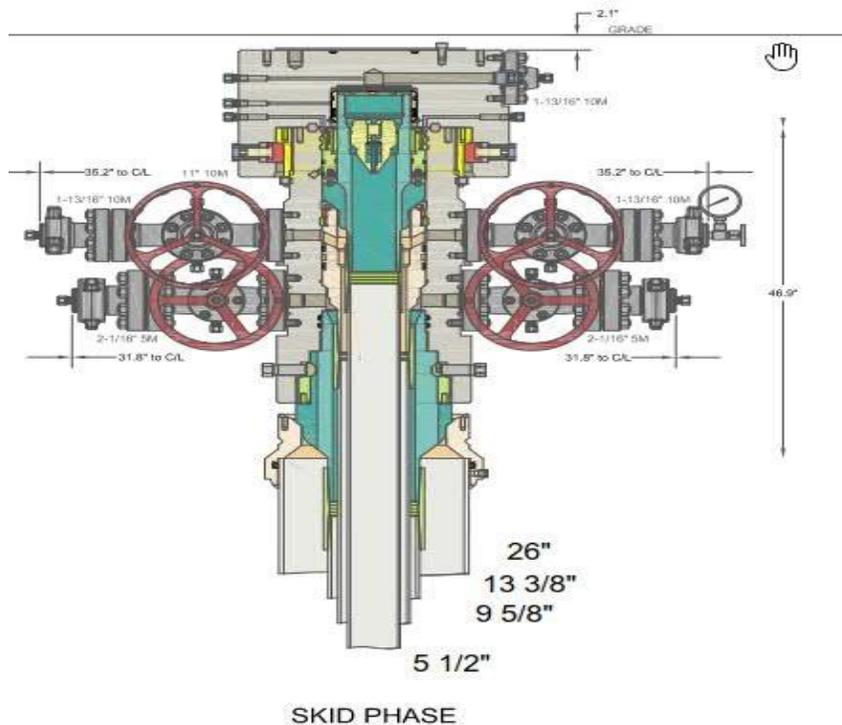


Illustration 2-2

Production Casing – PR intends to Batch set all Production casings with Rig. Appropriate notifications will be made prior Testing BOPE, and prior to running/cementing all casing strings.

1. Big Rig will remove the nightcap and install and test BOPE.
2. Install wear bushing then drill Intermediate shoe-track plus 20' and conduct FIT to minimum MW equivalent to control the formation pressure to TD of well.
3. Drill Vertical hole to KOP – Trip out for Curve BHA.
4. Drill Curve, landing in production interval – Trip for Lateral BHA.
5. Drill Lateral / Production hole to Permitted BHL, perform cleanup cycles and trip out to run 5 1/2" Production Casing.
6. Remove wear bushing then run 5-1/2" production casing to TD landing casing mandrel in wellhead.
7. Cement 5-1/2" Production string with floats holding.
8. Run in with wash tool and wash wellhead area – install pack-off and test void to 5,000psi for 15 minutes.
9. Install BPV in 5-1/2" mandrel hanger – Nipple down BOPE and install nightcap.
10. Test nightcap void to 5,000psi for 30 minutes per illustration 2-2

Permian Resources BOP Break Testing Variance Procedure

Subject: Request for a Variance Allowing break Testing of the Blowout Preventer Equipment (BOPE). Permian Resources requests a variance to ONLY test broken pressure seals on the BOPE and function test BOP when skidding a drilling rig between multiple wells on a pad.

Background

Title 43 CFR 3172, Drilling Operations, Sections 6.b.9.iv states that the BOP test must be performed whenever any seal subject to test pressure is broken. The current interpretation of the Bureau of Land Management (BLM) requires a complete BOP test and not just a test of the affected component. 43 CFR 3172.13, Variances from minimum standards states, "An operator may request the authorized officer to approve a variance from any of the minimum standards prescribed in [§§ 3172.6](#) through [3172.12](#). All such requests shall be submitted in writing to the appropriate authorized officer and provide information as to the circumstances which warrant approval of the variance(s) requested and the proposed alternative methods by which the related minimum standard(s) are to be satisfied. The authorized officer, after considering all relevant factors, if appropriate, may approve the requested variance(s) if it is determined that the proposed alternative(s) meet or exceed the objectives of the applicable minimum standard(s)." Permian Resources feels the break testing the BOPE is such a situation. Therefore, as per 43 CFR 3172.13, Permian Resources submits this request for the variance.

Supporting Documentation

The language used in 43 CFR 3172 became effective on December 19, 1988 and has remained the standard for regulating BLM onshore drilling operations for over 30 years. During this time, there have been significant changes in drilling technology. The BLM continues to use the variance request process to allow for the use of modern technology and acceptable engineering practices that have arisen since 43 CFR 3172 was originally released. The Permian Resources drilling rig fleet has many modern upgrades that allow the intact BOP stack to be moved between well slots on a multi-well pad, as well as, wellhead designs that incorporate quick connects facilitating release of the BOP from the wellhead without breaking any BOP stack components apart. These technologies have been used extensively offshore, and other regulators, API, and many operators around the world have endorsed break testing as safe and reliable.

Figure 1: Winch System attached to BOP Stack

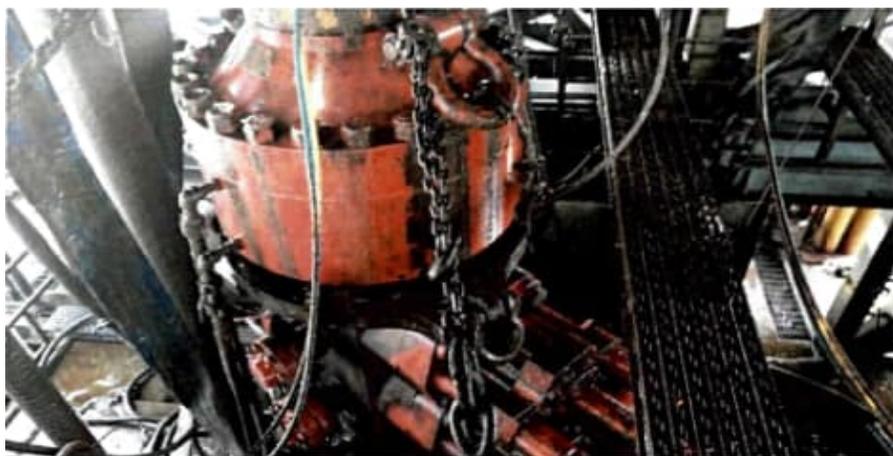


Figure 2: BOP Winch System



American Petroleum Institute (API) standards, specification and recommended practices are considered the industry standard and are consistently utilized and referenced by the industry. 43 CFR 3172 recognizes API recommended Practices (RP) 53 in its original development. API Standard 53, Well Control Equipment Systems for Drilling Wells (Fifth Edition, December 2018, Annex C, Table C.4) recognizes break testing as an acceptable practice. Specifically, API Standard 53, Section 5.3.7.1 states "A pressure test of the pressure containing component shall be performed following the disconnection or repair, limited to the affected component." See Table C.4 below for reference.

62		API STANDARD 53	
Table C.4—Initial Pressure Testing, Surface BOP Stacks			
Component to be Pressure Tested	Pressure Test—Low Pressure ^{a,c} psig (MPa)	Pressure Test—High Pressure ^{a,c}	
		Change Out of Component, Elastomer, or Ring Gasket	No Change Out of Component, Elastomer, or Ring Gasket
Annular preventer ^b	250 to 350 (1.72 to 2.41)	RWP of annular preventer	MASP or 70% annular RWP, whichever is lower.
Fixed pipe, variable bore, blind, and BSR preventers ^{b,c}	250 to 350 (1.72 to 2.41)	RWP of ram preventer or wellhead system, whichever is lower	ITP
Choke and kill line and BOP side outlet valves below ram preventers (both sides)	250 to 350 (1.72 to 2.41)	RWP of side outlet valve or wellhead system, whichever is lower	ITP
Choke manifold—upstream of chokes ^a	250 to 350 (1.72 to 2.41)	RWP of ram preventers or wellhead system, whichever is lower	ITP
Choke manifold—downstream of chokes ^a	250 to 350 (1.72 to 2.41)	RWP of valve(s), line(s), or MASP for the well program, whichever is lower	
Kelly, kelly valves, drill pipe safety valves, IBOPs	250 to 350 (1.72 to 2.41)	MASP for the well program	

^a Pressure test evaluation periods shall be a minimum of five minutes. No visible leaks. The pressure shall remain stable during the evaluation period. The pressure shall not decrease below the intended test pressure.

^b Annular(s) and VBR(s) shall be pressure tested on the largest and smallest OD drill pipe to be used in well program.

^c For pad drilling operations, moving from one wellhead to another within the 21 days, pressure testing is required for pressure-containing and pressure-controlling connections when the integrity of a pressure seal is broken.

^d For surface offshore operations, the ram BOPs shall be pressure tested with the ram locks engaged and the closing and locking pressure vented during the initial test. For land operations, the ram BOPs shall be pressure tested with the ram locks engaged and the closing and locking pressure vented at commissioning and annually.

^e Adjustable chokes are not required to be full sealing devices. Pressure testing against a closed choke is not required.

The Bureau of Safety and Environmental Enforcement (BSEE), Department of Interior, has also utilized the API standards, specification and best practices in the development of its offshore oil and gas regulations and incorporates them by reference within its regulations.

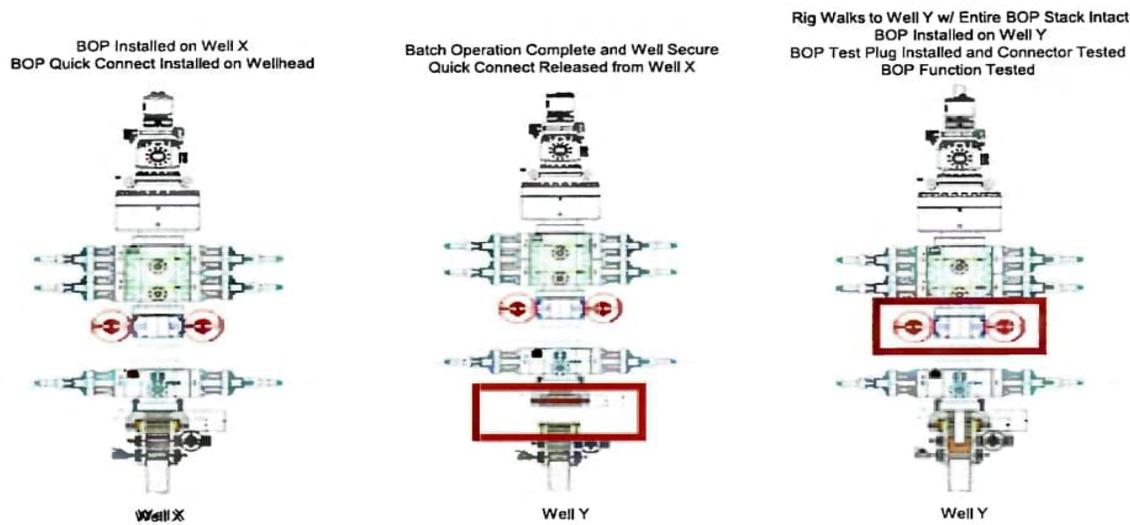
Break testing has been approved by the BLM in the past with other operators based on the detailed information provided in this document.

Permian Resources feels break testing and our current procedures meet the intent of 43 CFR 3172 and often exceed it. There has been no evidence that break testing results in more components failing than seen on full BOP tests. Permian Resources internal standards require complete BOPE tests more often than that of 43 CFR 3172 (every 21 days). In addition to function testing the annular, pipe rams and blind rams after each BOP nipple up, Permian Resources performs a choke drill with the rig crew prior to drilling out every casing shoe. This is additional training for the rig crew that exceeds the requirements of 43 CFR 3172.

Procedures

- 1) Permian Resources will use this document for our break testing plan for New Mexico Delaware Basin. The summary below will be referenced in the APD or Sundry Notice and receive approval prior to implementing this variance.
- 2) Permian Resources will perform BOP break testing on multi-wells pads where multiple intermediate sections can be drilled and cased within the 21-day BOP test window.
 - a) A full BOP test will be conducted on the first well on the pad.
 - b) The first intermediate hole section drilled on the pad will be the deepest. All the remaining hole sections will be the same formation depth or shallower.
 - c) A full BOP test will be required if the intermediate hole section being drilled has a MASP over 5M.
 - d) A full BOP test will be required prior to drilling any production hole.
- 3) After performing a complete BOP test on the first well, the intermediate hole section will be drilled and cased, two breaks would be made on the BOP equipment.
 - a) Between the HCV valve and choke line connection
 - b) Between the BOP quick connect and the wellhead
- 4) The BOP is then lifted and removed from the wellhead by a hydraulic system.
- 5) After skidding to the next well, the BOP is moved to the wellhead by the same hydraulic system and installed.
- 6) The connections mentioned in 3a and 3b will then be reconnected.
- 7) Install test plug into the wellhead using test joint or drill pipe.
- 8) A shell test is performed against the upper pipe rams testing the two breaks.
- 9) The shell test will consist of a 250 psi low test and a high test to the value submitted in the APD or Sundry (e.g. 5,000 psi or 10,000psi).
- 10) Function tests will be performed on the following components: lower pipe rams, blind rams, and annular.
- 11) For a multi-well pad the same two breaks on the BOP would be made and on the next wells and steps 4 through 10 would be repeated.
- 12) A second break test would only be done if the intermediate hole section being drilled could not be completed within the 21 day BOP test window.

Note: Picture below highlights BOP components that will be tested during batch operations



Summary

A variance is requested to ONLY test broken pressure seals on the BOP equipment when moving from wellhead to wellhead which is in compliance with API Standard 53. API Standard 53 states, that for pad drilling operations, moving from one wellhead to another within 21 days, pressure testing is required for pressure-containing and pressure-controlling connections when the integrity of a pressure seal is broken.

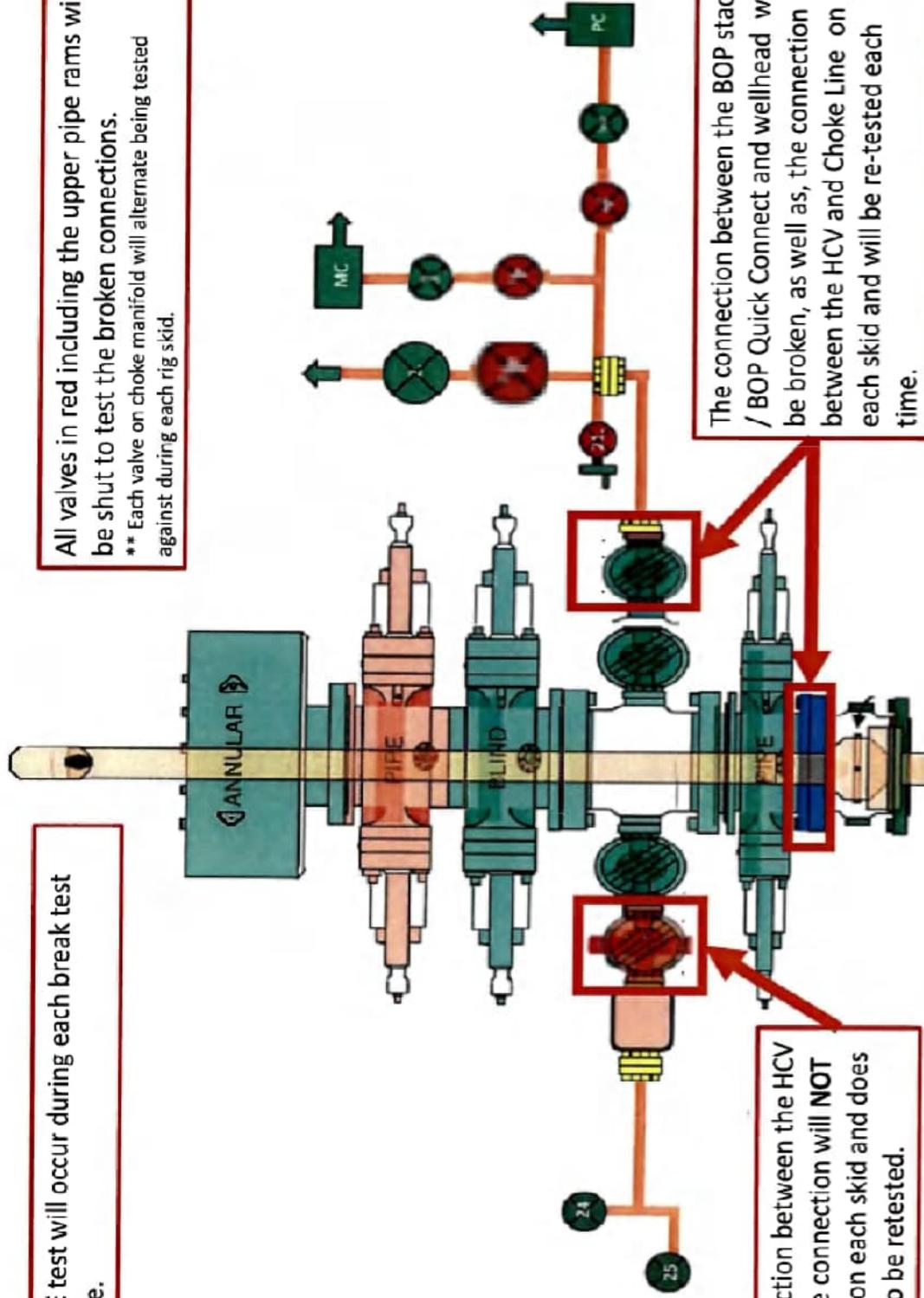
The BOP will be secured by a hydraulic carrier or cradle. The BLM will be contacted if a Well Control event occurs prior to the commencement of a BOPE Break Testing operation.

Based on public data and the supporting documentation submitted herein to the BLM, we will request permission to ONLY retest broken pressure seals if the following conditions are met:

- 1) After a full BOP test is conducted on the first well on the pad.
- 2) The first intermediate hole section drilled on the pad will be the deepest. All the remaining hole sections will be the same depth or shallower.
- 3) A full BOP test will be required if the intermediate hole section being drilled has a MASP over 5M.
- 4) A full BOP test will be required prior to drilling the production hole.

Only **ONE** test will occur during each break test procedure.

All valves in red including the upper pipe rams will be shut to test the broken connections.
** Each valve on choke manifold will alternate being tested against during each rig skid.

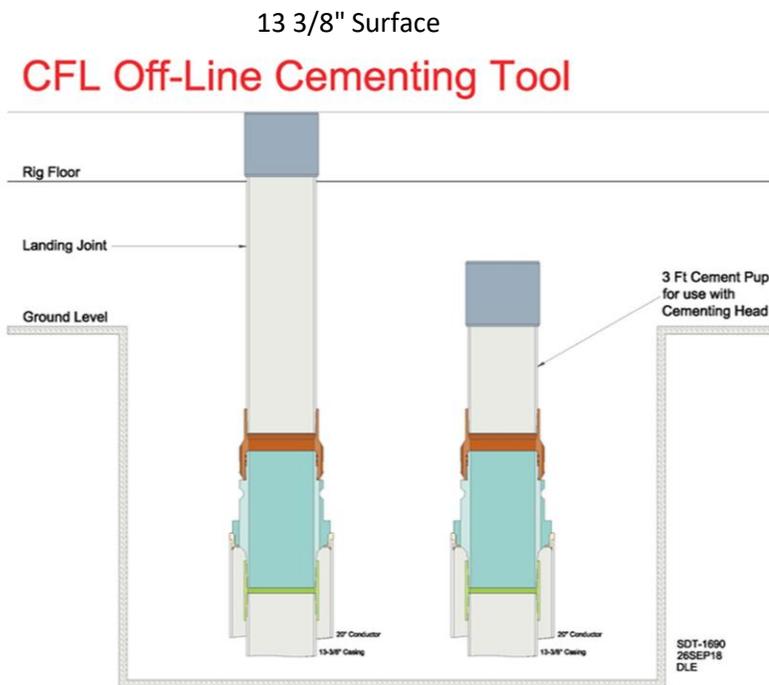


The connection between the HCV and kill line connection will **NOT** be broken on each skid and does not need to be retested.

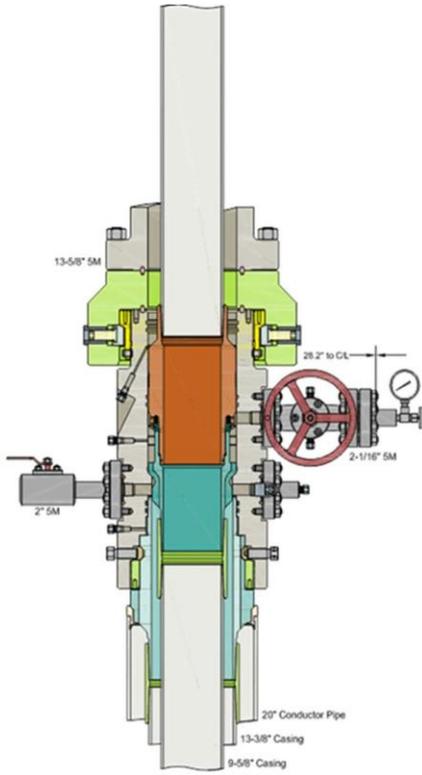
The connection between the BOP stack / BOP Quick Connect and wellhead will be broken, as well as, the connection between the HCV and Choke Line on each skid and will be re-tested each time.

**Permian Resources Offline Cementing Procedure
13-3/8" & 9-5/8" Casing**

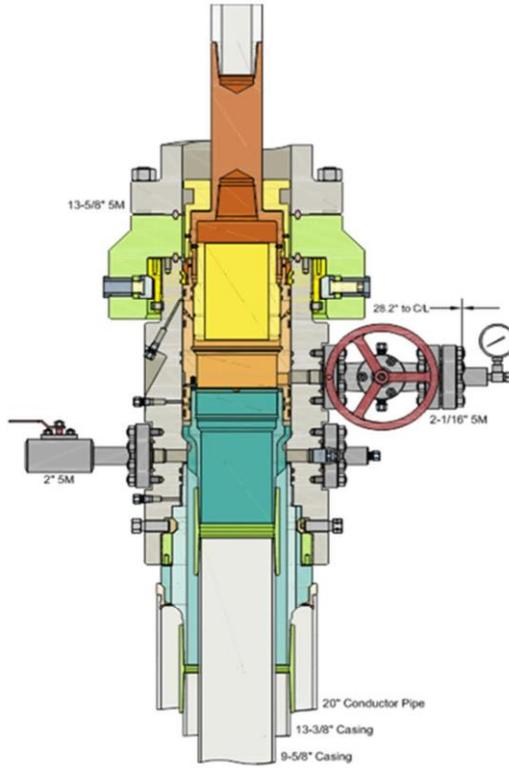
1. Drill hole to Total Depth with Rig and perform wellbore cleanup cycles.
2. Run and casing to Depth.
3. Land casing with mandrel.
4. Circulate 1.5 csg capacity.
5. Flow test – Confirm well is static and floats are holding.
6. Set Annular packoff and pressure test. Test to 5k.
7. Nipple down BOP and install cap flange.
8. Skid rig to next well on pad
9. Remove cap flange (confirm well is static before removal)
 - a) If well is not static use the casing outlet valves to kill well
 - b) Drillers method will be used in well control event
 - c) High pressure return line will be rigged up to lower casing valve and run to choke manifold to control annular pressure
 - d) Kill mud will be circulated once influx is circulated out of hole
 - e) Confirm well is static and remove cap flange to start offline cement operations
10. Install offline cement tool.
11. Rig up cementers.
12. Circulate bottoms up with cement truck
13. Commence planned cement job, take returns through the annulus wellhead valve
14. After plug is bumped confirm floats hold and well is static
15. Rig down cementers and equipment
16. Install night cap with pressure gauge to monitor.



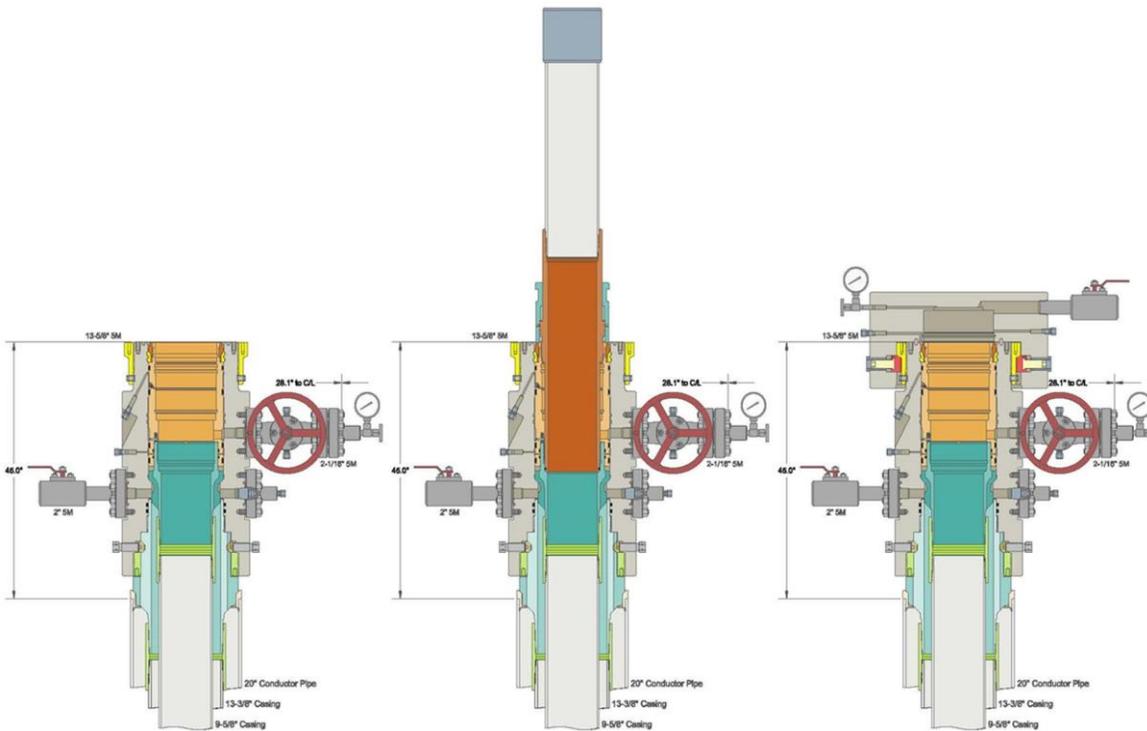
9 5/8" Intermediate



Run 9-5/8" Casing
Land Casing on 9-5/8" Mandrel Hanger
Cement 9-5/8" Casing
Retrieve Running Tool



Run 13-5/8" Packoff
Test Upper and Lower Seals
Engage Lockring
Retrieve Running Tool





GATES ENGINEERING & SERVICES NORTH AMERICA
7603 Prairle Oak Dr.
Houston, TX. 77086

PHONE: +1 (281) 602-4100
FAX: +1 (281) 602-4147
EMAIL: gesna.quality@gates.com
WEB: www.gates.com/oilandgas

CERTIFICATE OF CONFORMANCE

This is to verify that the items detailed below meet the requirements of the Customer's Purchase Order referenced herein, and are in Conformance with applicable specifications, and that Records of Required Tests are on file and subject to examination. The following items were inspected and hydrostatically tested at Gates Engineering & Services North America facilities in Houston, TX, USA.

CUSTOMER: HELMERICH & PAYNE INTERNATIONAL DRILLING CO.
CUSTOMER P.O.#: 740414061 (SN: 62429 - 88061537)
CUSTOMER P/N: SN: 62429 - 88061537

PART DESCRIPTION: INSPECT AND RETEST CUSTOMER HOSE 3IN X 16FT CHOKE & KILL ASSEMBLY C/W 3-1/16 FLANGES BX154 SS INLAID RING GROOVE EACH END

SALES ORDER #: 525826
QUANTITY: 1
SERIAL #: 62429 H3-012523-17

SIGNATURE: F. Cisneros
TITLE: QUALITY ASSURANCE
DATE: 1/26/2023



H3-12183

1/25/2023 2:59:32 PM

TEST REPORT

CUSTOMER

Company: HELMERICH & PAYNE
INTERNATIONAL DRILLING CO.

Production description: SN62429
Sales order #: 525826
Customer reference:

TEST OBJECT

Serial number: H3-012523-17
Lot number:
Description: SN62429
Hose ID: 3.0 CK03 16C 10K
Part number:

TEST INFORMATION

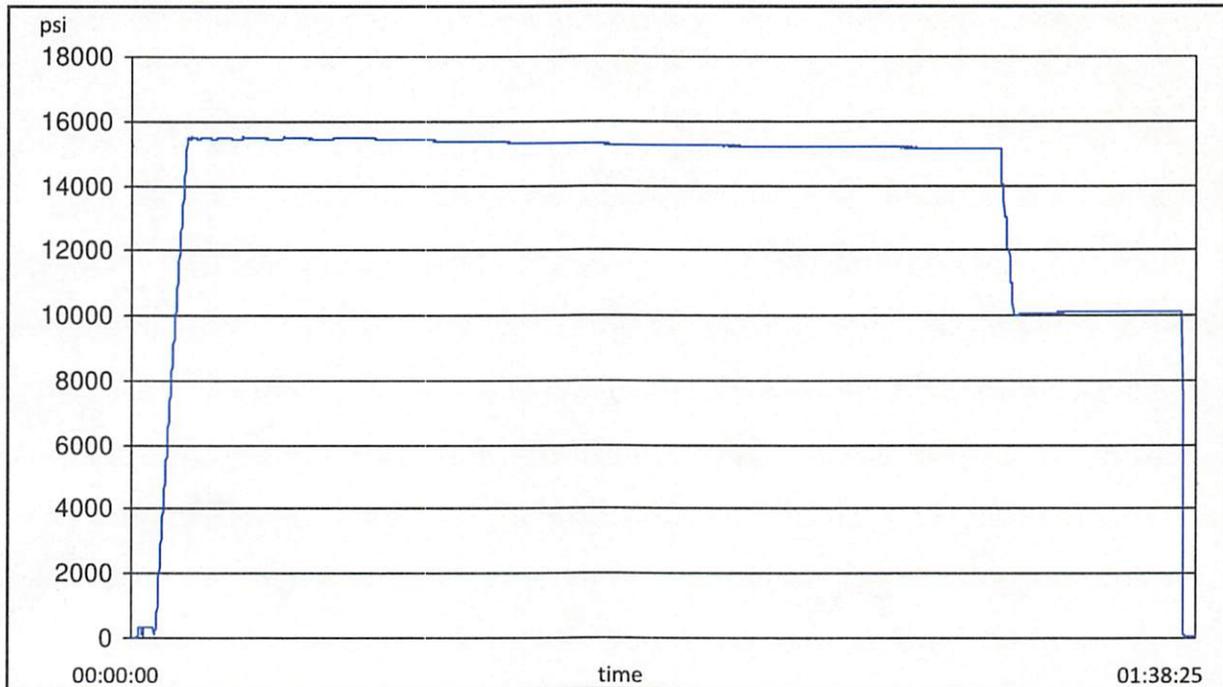
Test procedure: GTS-04-053
Test pressure: 15000.00 psi
Test pressure hold: 3600.00 sec
Work pressure: 10000.00 psi
Work pressure hold: 900.00 sec
Length difference: 0.00 %
Length difference: 0.00 inch

Fitting 1: 3.0 x 3-1/16 10K
Part number:
Description:
Fitting 2: 3.0 x 3-1/16 10K
Part number:
Description:

Visual check:
Pressure test result: PASS
Length measurement result:

Length: 16 feet

Test operator: Martin





H3-12183

1/25/2023 2:59:32 PM

TEST REPORT

GAUGE TRACEABILITY

Description	Serial number	Calibration date	Calibration due date
S-25-A-W	110AQA1S	2022-03-09	2023-03-09
S-25-A-W	110CBWVV	2022-03-09	2023-03-09

Comment



CONTITECH RUBBER Industrial Kft.	No: QC-DB-062 / 2022
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ContiTech

TEST CERTIFICATE according to EN 10204 3.1 and Supplier's Declaration of Conformity acc. to ISO/IEC 17050-1		CERT. N°: 81142
CUSTOMER: ContiTech Oil & Marine Corp.	C.O. N°: 4501624407	
Supplier's name: Contitech Rubber Industrial Kft.	Supplier's address: Budapesti út 10. H-6728 Szeged	
CONTITECH ORDER N°: 1386035	HOSE TYPE: 3" ID	Choke & Kill Hose
HOSE SERIAL N°: 81142	NOMINAL / ACTUAL LENGTH: 7,92 m / 7,90 m	
W.P. 69,0 MPa 10000 psi	T.P. 103,5 MPa 15000 psi	Duration: 60 min.

Pressure test with water at ambient temperature

See attachment (1 page)

COUPLINGS Type	Serial N°	Quality	Heat N°
3" coupling with 3 1/16" 10K API b.w. Flange end	4411	AISI 4130	68655
		AISI 4130	043795
3" coupling with 3 1/16" 10K API Swivel Flange end Hub	4428	AISI 4130	68626
		AISI 4130	041743
		AISI 4130	54538

Not Designed For Well Testing

API Spec 16C 3rd Edition – FSL3

Fire Rated

Temperature rate: "B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Customer Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, other technical standards and specifications and meet the relevant acceptance criteria and design requirements. This declaration of conformity is issued under the sole responsibility of the manufacturer.

COUNTRY OF ORIGIN HUNGARY/EU

Date: 28. February 2022.	Inspector	Quality Control ContiTech Rubber Industrial Kft. Quality Control Dept (1)
		István Farkas Lajos Bacsa

ContiTech Rubber Industrial Kft. | Budapesti út 10. H-6728 Szeged | H-6701 P.O.Box 152 Szeged, Hungary
 Phone: +36 20 292 2075 | e-mail: info@fluid.contitech.hu | Internet: www.contitech-rubber.hu; www.contitech-oil-gas.com
 The Court of Csongrád County as Registry Court | Registry Court No: Cg.06-09-002502 | EU VAT No: HU11087209
 Bank data Commerzbank Zrt., Budapest | 14220108-26830003

ATTACHMENT OF QUALITY CONTROL
INSPECTION AND TEST CERTIFICATE
No: 81137, 81138, 81139,
81140, 81141, 81142

CONTITECH RUBBER Industrial Kft.	No: QC-DB-062 / 2022
	Page: 17 / 131

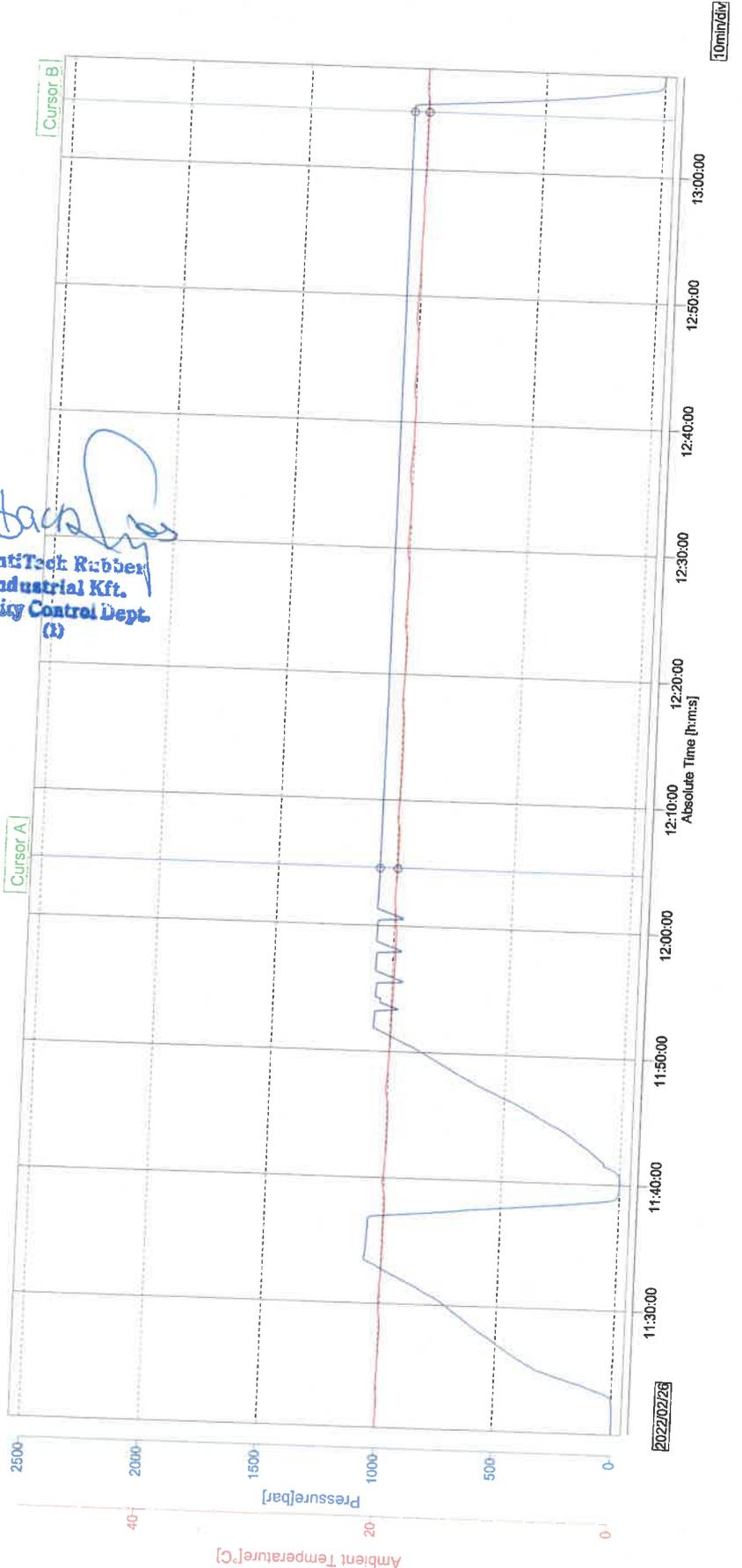
1/1

Sampling Int. : 5.000 sec
Start Time : 2022/02/26 11:20:10.000
Stop Time : 2022/02/26 13:08:00.000

File Name : 048171_81137-81142.GEV...048181_81137-81142.GEV
File Message : 81137,81138,81139,81140,81141,81142
Device Type : GX10
Serial No. : SSP606399
Data Count : 1295
Print Group :
Print Range :
Comment : Press-Temp : 2022/02/26 11:20:10.000 - 2022/02/26 13:08:00.000
110BFGHI 81137,81138,81139,81140,81141,81142

Data No.	Cursor A	Cursor B	Difference
Absolute Time	2022/02/26 12:04:35.000	2022/02/26 13:04:35.000	01:00:00.000
Tag Comment	Value A	Value B	Value B-A
Pressure[bar]	1070.80	1057.49	-13.31
Ambient Temperature[C]	19.90	19.88	-0.02

Yakov
Contitech Rubber
Industrial Kft.
Quality Control Dept.
(1)



District I
 1625 N. French Dr., Hobbs, NM 88240
 Phone:(575) 393-6161 Fax:(575) 393-0720

District II
 811 S. First St., Artesia, NM 88210
 Phone:(575) 748-1283 Fax:(575) 748-9720

District III
 1000 Rio Brazos Rd., Aztec, NM 87410
 Phone:(505) 334-6178 Fax:(505) 334-6170

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

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

CONDITIONS
 Action 355078

CONDITIONS

Operator: NOVO OIL & GAS NORTHERN DELAWARE, LLC 300 N. Marienfeld St Ste 1000 Midland, TX 79701	OGRID: 372920
	Action Number: 355078
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
ward.rikala	All original COA's still apply. Additionally, if cement is not circulated to surface during cementing operations, then a CBL is required.	6/27/2024