**District I**
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
**District II**
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
**District III**
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
**District IV**
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

Form C-101
August 1, 2011

Permit 374720

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

| 1. Operator Name and Address | 2. OGRID Number |
|---|---|
| Permian Resources Operating, LLC<br>300 N. Marienfeld St Ste 1000<br>Midland, TX 79701 | 372165 |
| | 3. API Number<br>30-015-55674 |

| 4. Property Code | 5. Property Name | 6. Well No. |
|---|---|---|
| 335404 | CAVEMAN | 222H |

**7. Surface Location**

| UL - Lot | Section | Township | Range | Lot Idn | Feet From | N/S Line | Feet From | E/W Line | County |
|---|---|---|---|---|---|---|---|---|---|
| E | 8 | 22S | 27E | E | 2573 | N | 482 | W | Eddy |

**8. Proposed Bottom Hole Location**

| UL - Lot | Section | Township | Range | Lot Idn | Feet From | N/S Line | Feet From | E/W Line | County |
|---|---|---|---|---|---|---|---|---|---|
| E | 12 | 22S | 26E | E | 1980 | N | 330 | W | Eddy |

**9. Pool Information**

| | |
|---|---|
| PURPLE SAGE;WOLFCAMP (GAS) | 98220 |

**Additional Well Information**

| 11. Work Type | 12. Well Type | 13. Cable/Rotary | 14. Lease Type | 15. Ground Level Elevation |
|---|---|---|---|---|
| New Well | GAS | | State | 3100 |
| **16. Multiple** | **17. Proposed Depth** | **18. Formation** | **19. Contractor** | **20. Spud Date** |
| N | 18933 | Wolfcamp | | 1/7/2025 |
| Depth to Ground water | | Distance from nearest fresh water well | | Distance to nearest surface water |

☐ **We will be using a closed-loop system in lieu of lined pits**

**21. Proposed Casing and Cement Program**

| Type | Hole Size | Casing Size | Casing Weight/ft | Setting Depth | Sacks of Cement | Estimated TOC |
|---|---|---|---|---|---|---|
| Surf | 17.5 | 13.375 | 54.5 | 300 | 240 | 0 |
| Int1 | 12.25 | 9.625 | 36 | 1975 | 500 | 0 |
| Prod | 8.75 | 5.5 | 20 | 9095 | 700 | 1475 |
| Prod | 7.875 | 5.5 | 20 | 18933 | 1370 | 8345 |

**Casing/Cement Program: Additional Comments**

DV Tool Contingency Plan Request Anticipated DVT Placement: ~1450' cement Details – Cement volumes will be adjusted accordingly based on DVT Placement. Planned TOC: Surface. Stage 1 (intermediate she to DVT) Lead: 100sx (54.3bbls) Cl C, 11ppg, 3.05 cf/sx cmt (120% excess) Additives: 100% ProLiteCH+5PPS Plexcredit STE+2%SMS+0.1% R-1300+0.25% MagBond+3PPS Gilsonite+0.005GPS TOC: 1450' (DVT) Tail: 255sx (62.2bbl) Cl C, 14.8ppg, 1.37cf/sx cmt (30% excess) Additives: +5% Salt+0.25% MagBond+0.005GPS TOC: 1500' Stage 2 (DVT to Surface) Lead: 270 sx (5146.7bbls) Cl C, 11ppg, 3.05 cf/sx cmt (300% excess) Additives: 100% ProLiteCH+5PPS Plexcredit STE+2%SMS+0.1% R-1300+0.25% MagBond+3PPS Gilsonite+0.005GPS TOC: Surface Tail: 165sx (39.1bbl) Cl C, 14.8ppg, 1.33cf/sx cmt (40% excess) Additives: +5% Salt+0.25% MagBond+0.005GPS TOC: 1450' (DVT)

**22. Proposed Blowout Prevention Program**

| Type | Working Pressure | Test Pressure | Manufacturer |
|---|---|---|---|
| Double Ram | 5000 | 5000 | |

| 23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief. **I further certify I have complied with 19.15.14.9 (A) NMAC ☒ and/or 19.15.14.9 (B) NMAC ☒, if applicable.** Signature: | | **OIL CONSERVATION DIVISION** | |
|---|---|---|---|
| Printed Name: | Electronically filed by Stephanie Rabadue | Approved By: | Ward Rikala |
| Title: | Regulatory Manager | Title: | Petroleum Specialist Supervisor |
| Email Address: | stephanie.rabadue@permianres.com | Approved Date: | 11/6/2024 Expiration Date: 11/6/2026 |
| Date: | 10/10/2024 Phone: 432-260-4388 | Conditions of Approval Attached | |

| C-102<br>Submit Electronically<br>Via OCD Permitting | State of New Mexico<br>Energy, Minerals & Natural Resources Department<br>OIL CONSERVATION DIVISION | Revised July 9, 2024<br>Submittal Type: ☑ Initial Submittal ☐ Amended Report ☐ As Drilled |
|---|---|---|

WELL LOCATION INFORMATION

| API Number | Pool Code | Pool Name |
|---|---|---|
| | 98220 | Purple Sage; Wolfcamp |

| Property Code | Property Name | Well Number |
|---|---|---|
| | CAVEMAN | 222H |

| OGRID No. | Operator Name | Ground Level Elevation |
|---|---|---|
| 372165 | PERMIAN RESOURCES OPERATING, LLC | 3,100' |

Surface Owner: ☐ State ☑ Fee ☐ Tribal ☐ Federal | Mineral Owner: ☐ State ☑ Fee ☐ Tribal ☐ Federal

Surface Location

| UL | Section | Township | Range | Lot | Ft. from N/S | Ft. from E/W | Latitude | Longitude | County |
|---|---|---|---|---|---|---|---|---|---|
| E | 8 | 22 S | 27 E | | 2,573' FNL | 482' FWL | 32.407474 | -104.218740 | EDDY |

Bottom Hole Location

| UL | Section | Township | Range | Lot | Ft. from N/S | Ft. from E/W | Latitude | Longitude | County |
|---|---|---|---|---|---|---|---|---|---|
| E | 12 | 22 S | 26 E | | 1,980' FNL | 330' FWL | 32.409041 | -104.253965 | EDDY |

| Dedicated Acres | Infill or Defining Well | Defining Well API | Overlapping Spacing Unit (Y/N) | Consolidation Code |
|---|---|---|---|---|
| 640 | | | | |

Order Numbers. | Well setbacks are under Common Ownership: ☐Yes ☐No

Kick Off Point (KOP)

| UL | Section | Township | Range | Lot | Ft. from N/S | Ft. from E/W | Latitude | Longitude | County |
|---|---|---|---|---|---|---|---|---|---|
| E | 8 | 22 S | 27 E | | 2,573' FNL | 482' FWL | 32.407474 | -104.218740 | EDDY |

First Take Point (FTP)

| UL | Section | Township | Range | Lot | Ft. from N/S | Ft. from E/W | Latitude | Longitude | County |
|---|---|---|---|---|---|---|---|---|---|
| H | 7 | 22 S | 27 E | | 1,980' FNL | 330' FEL | 32.409084 | -104.221379 | EDDY |

Last Take Point (LTP)

| UL | Section | Township | Range | Lot | Ft. from N/S | Ft. from E/W | Latitude | Longitude | County |
|---|---|---|---|---|---|---|---|---|---|
| E | 12 | 22 S | 26 E | | 1,980' FNL | 330' FWL | 32.409041 | -104.253965 | EDDY |

| Unitized Area or Area of Uniform Interest | Spacing Unit Type ☐ Horizontal ☐ Vertical | Ground Floor Elevation: |
|---|---|---|
| | | |

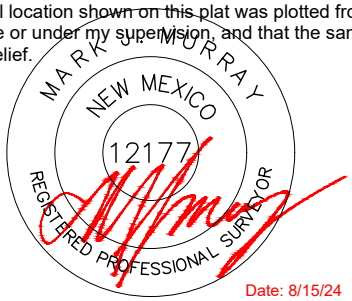
OPERATOR CERTIFICATIONS

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and, if the well is a vertical or directional well, 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 a working interest or unleased mineral interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

If this well is a horizontal well, I further certify that this organization has received the consent of at least one lessee or owner of a working interest or unleased mineral interest in each tract (in the target pool or formation) in which any part of the well's completed interval will be located or obtained a compulsory pooling order from the division.

SURVEYOR CERTIFICATIONS

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: 8/15/24

| Signature | Date | Signature and Seal of Professional Surveyor |
|---|---|---|
| Cassie Evans | 9/29/24 | |

| Printed Name | Certificate Number | Date of Survey |
|---|---|---|
| Cassie Evans | 12177 | 7/27/2024 |

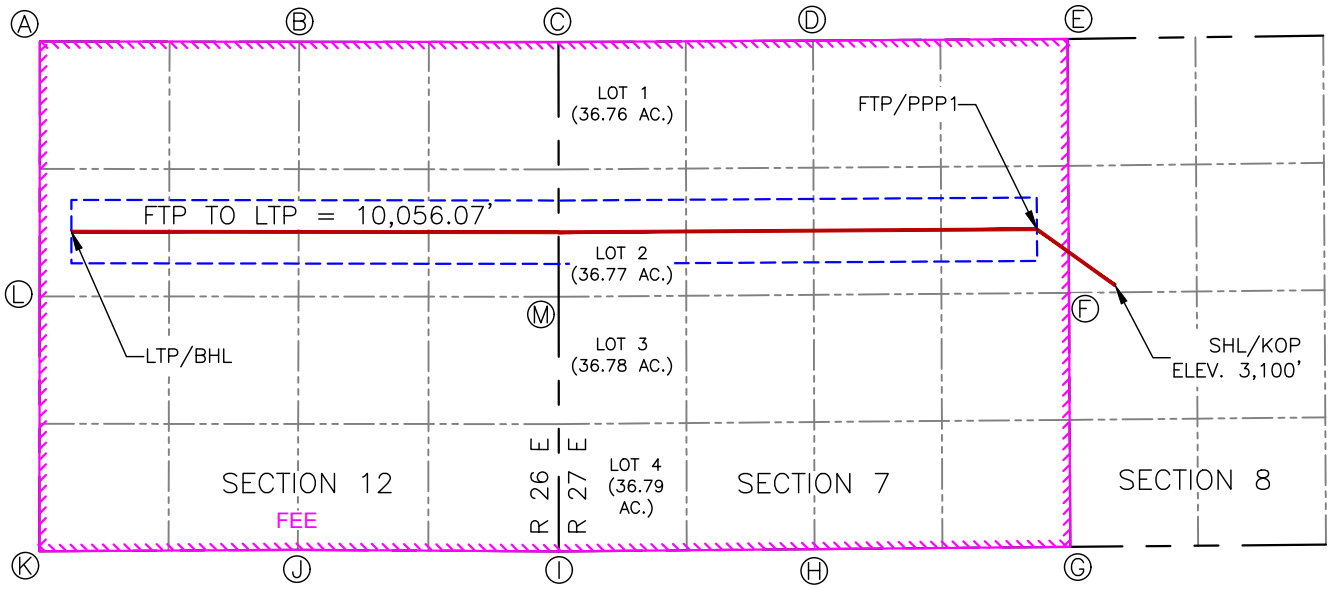
Email Address: Cassie.Evans@permianres.com

Note: 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.

ACREAGE DEDICATION PLATS

This grid represents a standard section. You may superimpose a non-standard section, or larger area, over this grid. Operators must outline the dedicated acreage in a red box, clearly show the well surface location and bottom hole location, if it is directionally drilled, with the dimensions from the section lines in the cardinal directions. If this is a horizontal wellbore show on this plat the location of the First Take Point and Last Take Point, and the point within the Completed interval (other than the First Take Point or Last Take Point) that is closest to any outer boundary of the tract.

Surveyors shall use the latest United States government survey or dependent resurvey. Well locations will be in reference to the New Mexico Principal Meridian. If the land is not surveyed, contact the OCD Engineering Bureau. Independent subdivision surveys will not be acceptable.




SURFACE HOLE LOCATION
& KICK-OFF POINT
2,573' FNL & 482' FWL
ELEV. = 3,100'

NAD 83 X = 576,702.08'
NAD 83 Y = 511,989.14'
NAD 83 LAT = 32.407474°
NAD 83 LONG = -104.218740°

FIRST TAKE POINT &
PENETRATION POINT 1
1,980' FNL & 330' FEL

NAD 83 X = 575,886.97'
NAD 83 Y = 512,574.07'
NAD 83 LAT = 32.409084°
NAD 83 LONG = -104.221379°

LAST TAKE POINT &
BOTTOM HOLE LOCATION
1,980' FNL & 330' FWL

NAD 83 X = 565,831.00'
NAD 83 Y = 512,549.54'
NAD 83 LAT = 32.409041°
NAD 83 LONG = -104.253965°

| CORNER COORDINATES NEW MEXICO EAST - NAD 83 | |
|---|---|
| A | CALCULATED CORNER N:514,529.96' E:565,503.26' |
| B | CALCULATED CORNER N:514,526.57' E:568,203.80' |
| C | CALCULATED CORNER N:514,523.18' E:570,904.33' |
| D | CALCULATED CORNER N:514,539.63' E:573,555.46' |
| E | CALCULATED CORNER N:514,556.09' E:576,206.59' |
| F | CALCULATED CORNER N:511,910.96' E:576,220.44' |
| G | CALCULATED CORNER N:509,265.84' E:576,234.30' |
| H | CALCULATED CORNER N:509,242.27' E:573,570.94' |
| I | NAIL N:509,218.70' E:570,907.59' |
| J | CAPPED IRON ROD N:509,234.69' E:568,189.28' |
| K | CALCULATED CORNER N:509,220.26' E:565,497.19' |
| L | CALCULATED CORNER N:511,875.11' E:565,500.23' |
| M | CALCULATED CORNER N:511,870.94' E:570,905.96' |

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

Form APD Conditions

Permit 374720

## PERMIT CONDITIONS OF APPROVAL

| Operator Name and Address: | API Number: |
|---|---|
| Permian Resources Operating, LLC [372165]<br>300 N. Marienfeld St Ste 1000<br>Midland, TX 79701 | 30-015-55674 |
| | Well: CAVEMAN #222H |

| OCD Reviewer | Condition |
|---|---|
| pkautz | File As Drilled C-102 and a directional Survey with C-104 completion packet. |
| pkautz | Pit construction and closure must satisfy all requirements of operators approved plan. |
| pkautz | If using a pit for drilling and completion operations, must have an approved pit from prior to spudding the well. |
| pkautz | Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string. |
| pkautz | Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system. |
| pkautz | Notify the OCD 24 hours prior to casing & cement. |
| pkautz | A [C-103] Sub. Drilling (C-103N) is required within (10) days of spud. |
| pkautz | Cement is required to circulate on both surface and intermediate1 strings of casing. |
| pkautz | If cement does not circulate on any string, a Cement Bond Log (CBL) is required for that string of casing. |

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

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

# NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

## Section 1 – Plan Description
**Effective May 25, 2021**

**I. Operator:** Permian Resources Operating LLC **OGRID:** 372165 **Date:** 9/24/24

**II. Type:** ☒ Original ☐ Amendment due to ☐ 19.15.27.9.D(6)(a) NMAC ☐ 19.15.27.9.D(6)(b) NMAC ☐ Other.

If Other, please describe: _____

**III. Well(s):** Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

| Well Name | API | ULSTR | Footages | Anticipated Oil BBL/D | Anticipated Gas MCF/D | Anticipated Produced Water BBL/D |
|---|---|---|---|---|---|---|
| Caveman 111H | TBD | E-8-22S-27E | 2408' FNL, 483'FWL | 544 | 1859 | 1870 |
| Caveman 112H | TBD | E-8-22S-27E | 2441' FNL, 483'FWL | 544 | 1859 | 1870 |
| Caveman 113H | TBD | L-8-22S-27E | 2472' FSL, 300' FEL | 544 | 1859 | 1870 |
| Caveman 114H | TBD | L-8-22S-27E | 2439' FSL, 300' FWL | 544 | 1859 | 1870 |
| Caveman 121H | TBD | E-8-22S-27E | 2439' FNL, 303' FWL | 544 | 1859 | 1870 |
| Caveman 122H | TBD | E-8-22S-27E | 2505' FNL, 303' FWL | 544 | 1859 | 1870 |
| Caveman 123H | TBD | L-8-22S-27E | 2538' FSL, 301' FWL | 544 | 1859 | 1870 |
| Caveman 124H | TBD | L-8-22S-27E | 2536' FSL, 480' FWL | 544 | 1859 | 1870 |
| Caveman 132H | TBD | E-8-22S-27E | 2538' FNL, 303' FWL | 544 | 1859 | 1870 |
| Caveman 133H | TBD | E-8-22S-27E | 2571' FNL, 302' FWL | 544 | 1859 | 1870 |
| Caveman 134H | TBD | L-8-22S-27E | 2470' FSL, 480' FWL | 544 | 1859 | 1870 |
| Caveman 171H | TBD | E-8-22S-27E | 2406' FNL, 304' FWL | 544 | 1859 | 1870 |
| Caveman 172H | TBD | E-8-22S-27E | 2472' FNL, 303' FWL | 544 | 1859 | 1870 |
| Caveman 173H | TBD | L-8-22S-27E | 2571' FSL, 301' FWL | 544 | 1859 | 1870 |
| Caveman 174H | TBD | L-8-22S-27E | 2505' FSL, 300' FWL | 544 | 1859 | 1870 |
| Caveman 221H | TBD | E-8-22S-27E | 2540' FNL, 482' FWL | 544 | 1859 | 1870 |
| Caveman 222H | TBD | E-8-22S-27E | 2573' FNL, 482' FWL | 544 | 1859 | 1870 |
| Caveman 223H | TBD | L-8-22S-27E | 2569' FSL, 481' FWL | 544 | 1859 | 1870 |
| Caveman 224H | TBD | L-8-22S-27E | 2503' FSL, 480' FWL | 544 | 1859 | 1870 |
| Caveman 421H | TBD | E-8-22S-27E | 2474' FNL, 483' FWL | 544 | 1859 | 1870 |
| Caveman 423H | TBD | E-8-22S-27E | 2507' FNL, 483' FWL | 544 | 1859 | 1870 |
| Caveman 424H | TBD | L-8-22S-27E | 2437' FSL, 480' FEL | 544 | 1859 | 1870 |

**IV. Central Delivery Point Name:** Betty/Barney CTB [See 19.15.27.9(D)(1) NMAC]

**V. Anticipated Schedule:** Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

| Well Name | API | Spud Date | TD Reached Date | Completion Commencement Date | Initial Flow Back Date | First Production Date |
|---|---|---|---|---|---|---|

| | | | | | | |
|---|---|---|---|---|---|---|
| Caveman 111H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 112H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 113H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 114H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 121H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 122H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 123H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 124H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 132H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 133H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 134H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 171H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 172H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 173H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 174H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 221H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 222H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 223H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 224H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 421H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 423H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |
| Caveman 424H | TBD | 1/21/25 | TBD | TBD | TBD | TBD |

**VI. Separation Equipment:** ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

**VII. Operational Practices:** ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

**VIII. Best Management Practices:** ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

## Section 2 – Enhanced Plan

**EFFECTIVE APRIL 1, 2022**

[redacted]

## Section 3 - Certifications

**Effective May 25, 2021**

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

☐ Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

☒ Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system. ***If Operator checks this box, Operator will select one of the following:***

**Well Shut-In.** ☒ Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

**Venting and Flaring Plan.** ☐ Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- **(a)** power generation on lease;
- **(b)** power generation for grid;
- **(c)** compression on lease;
- **(d)** liquids removal on lease;
- **(e)** reinjection for underground storage;
- **(f)** reinjection for temporary storage;
- **(g)** reinjection for enhanced oil recovery;
- **(h)** fuel cell production; and
- **(i)** other alternative beneficial uses approved by the division.

## Section 4 - Notices

1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

**(a)** Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

**(b)** Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

**I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.**

| |
|---|
| Signature: Cassie Evans |
| Printed Name: Cassie Evans |
| Title: Regulatory Specialist |
| E-mail Address: Cassie.Evans@permianres.com |
| Date: 9/24/24 |
| Phone: 432-313-1732 |

| **OIL CONSERVATION DIVISION**<br>**(Only applicable when submitted as a standalone form)** |
|---|
| Approved By: |
| Title: |
| Approval Date: |
| Conditions of Approval: |

Permian Resources Operating, LLC (372165)

**Natural Gas Management Plan Descriptions**

**VI. Separation Equipment:**

Permian utilizes a production forecast from our Reservoir Engineering team to appropriately size each permanent, 3-phase separator and heater treater utilized for production operations. Our goal is to maintain 5 minutes of retention time in the test vessel and 20 minutes in the heater treater at peak production rates. The gas produced is routed from the separator to the gas sales line.

**VII. Operational Practices:**

*Drilling*

During Permian's drilling operations it is uncommon for venting or flaring to occur. If flaring is needed due to safety concerns, gas will be routed to a flare and volumes will be estimated.

*Flowback*

During completion/recompletion flowback operations, after separation flowback begins and as soon as it is technically feasible, Permian routes gas though a permanent separator and the controlled facility where the gas is either sold or flared through a high-pressure flare if needed.

*Production*

Per 19.15.27.8.D, Permian's facilities are designed to minimize waste. Our produced gas will only be vented or flared in an emergency or malfunction situation, except as allowed for normal operations noted in 19.15.27.8.D(2) & (4). All gas that is flared is metered. All gas that may be vented will be estimated.

*Performance Standards*

Permian utilizes a production forecast from our Reservoir Engineering team to appropriately size each permanent, 3-phase separator and heater treater utilized for production operations.

All of Permian's permanent storage tanks associated with production operations which are routed to a flare or control device are equipped with an automatic gauging system.

All of Permian's flare stacks, both currently installed and for future installation, are:

1) Appropriately sized and designed to ensure proper combustion efficiency.
2) Equipped with an automatic ignitor or continuous pilot.
3) Anchored and located at least 100 feet from the well and storage tanks.

Permian's field operations and HSE teams have implemented an AVO inspection schedule that adheres to the requirements of 19.15.27.8.E(5).

All of our operations and facilities are designed to minimize waste. We routinely employ the following methods and practices:

- Closed-loop systems
- Enclosed and properly sized tanks

- Vapor recovery units to maximize recovery of low-pressure gas streams and potential unauthorized emissions
- Low-emitting or electric engines whenever practical
- Combustors and flare stacks in the event of a malfunction or emergency
- Routine facility inspections to identify leaking components, functioning control devices, such as flares and combustors, and repair / replacement of malfunctioning components where applicable

*Measurement or estimation*

Permian measures or estimates the volumes of natural gas vented, flared and/or beneficially used for all of our drilling, completing and producing wells. We utilize accepted industry standards and methodology which can be independently verified. Annual GOR testing is completed on our wells and will be submitted as required by the OCD. None of our equipment is designed to allow diversion around metering elements except during inspection, maintenance and repair operations.

**VIII. Best Management Practices:**

Permian utilizes the following BMPs to minimize venting during active and planned maintenance activities:

- Use a closed-loop process wherever possible during planned maintenance activities, such as blowdowns, liquid removal, and work over operations.
- Employ low-emitting or electric engines for equipment, such as compressors
- Adhere to a strict preventative maintenance program which includes routine facility inspections, identification of component malfunctions, and repairing or replacing components such as hatches, seals, valves, etc. where applicable
- Utilize vapor recovery units (VRU's) to maximize recovery of volumes of low-pressure gas streams and potential unauthorized emissions
- Route low pressure gas and emissions streams to a combustion device to prevent venting where necessary

PERMIAN RESOURCES

# NEW MEXICO

**(SP) EDDY**
**CAVEMAN PROJECT**
**CAVEMAN 222H**

**OWB**

**Plan: PWP0**

# Standard Planning Report - Geographic

**04 September, 2024**

PERMIAN RESOURCES

# Planning Report - Geographic

| | | | |
|---|---|---|---|
| **Database:** | Compass_17 | **Local Co-ordinate Reference:** | Well CAVEMAN 222H |
| **Company:** | NEW MEXICO | **TVD Reference:** | KB @ 3130.0usft |
| **Project:** | (SP) EDDY | **MD Reference:** | KB @ 3130.0usft |
| **Site:** | CAVEMAN PROJECT | **North Reference:** | Grid |
| **Well:** | CAVEMAN 222H | **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** CAVEMAN PROJECT

| | | | | | |
|---|---|---|---|---|---|
| **Site Position:** | | **Northing:** | 512,055.14 usft | **Latitude:** | 32° 24' 27.558 N |
| **From:** | Map | **Easting:** | 576,702.31 usft | **Longitude:** | 104° 13' 7.460 W |
| **Position Uncertainty:** | 0.0 usft | **Slot Radius:** | 13-3/16 " | | |

**Well** CAVEMAN 222H

| | | | | | | |
|---|---|---|---|---|---|---|
| **Well Position** | **+N/-S** | 0.0 usft | **Northing:** | 511,989.14 usft | **Latitude:** | 32° 24' 26.905 N |
| | **+E/-W** | 0.0 usft | **Easting:** | 576,702.08 usft | **Longitude:** | 104° 13' 7.464 W |
| **Position Uncertainty** | | 0.0 usft | **Wellhead Elevation:** | usft | **Ground Level:** | 3,100.0 usft |
| **Grid Convergence:** | | 0.06 ° | | | | |

**Wellbore** OWB

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF200510 | 12/31/2009 | 8.06 | 60.30 | 48,833.21558780 |

**Design** PWP0

**Audit Notes:**

| | | | | | |
|---|---|---|---|---|---|
| **Version:** | | **Phase:** | PROTOTYPE | **Tie On Depth:** | 0.0 |

| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 272.95 |

**Plan Survey Tool Program** **Date** 9/4/2024

| | Depth From (usft) | Depth To (usft) | Survey (Wellbore) | Tool Name | Remarks |
|---|---|---|---|---|---|
| 1 | 0.0 | 18,933.3 | PWP0 (OWB) | MWD<br>OWSG_Rev2_ MWD - Standa | |

**Plan Sections**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Dogleg Rate (°/100usft) | Build Rate (°/100usft) | Turn Rate (°/100usft) | TFO (°) | Target |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,000.0 | 0.00 | 0.00 | 1,000.0 | 0.0 | 0.0 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 1,333.5 | 6.67 | 316.50 | 1,332.7 | 14.1 | -13.3 | 2.00 | 2.00 | 0.00 | 316.50 | |
| 7,942.8 | 6.67 | 316.50 | 7,897.3 | 570.9 | -541.8 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 8,276.2 | 0.00 | 0.00 | 8,230.0 | 584.9 | -555.1 | 2.00 | -2.00 | 0.00 | 180.00 | |
| 8,344.7 | 0.00 | 0.00 | 8,298.5 | 584.9 | -555.1 | 0.00 | 0.00 | 0.00 | 0.00 | |
| 9,094.7 | 90.00 | 269.86 | 8,776.0 | 583.8 | -1,032.6 | 12.00 | 12.00 | -12.02 | 269.86 | |
| 18,933.3 | 90.00 | 269.86 | 8,776.0 | 560.4 | -10,871.1 | 0.00 | 0.00 | 0.00 | 0.00 | BHL-CAVEMAN 222H |

PERMIAN RESOURCES

Planning Report - Geographic

| | | | |
|---|---|---|---|
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| **Company:** | NEW MEXICO | **TVD Reference:** | KB @ 3130.0usft |
| **Project:** | (SP) EDDY | **MD Reference:** | KB @ 3130.0usft |
| **Site:** | CAVEMAN PROJECT | **North Reference:** | Grid |
| **Well:** | CAVEMAN 222H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | OWB | | |
| **Design:** | PWP0 | | |

**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 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| 100.0 | 0.00 | 0.00 | 100.0 | 0.0 | 0.0 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| 200.0 | 0.00 | 0.00 | 200.0 | 0.0 | 0.0 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| 300.0 | 0.00 | 0.00 | 300.0 | 0.0 | 0.0 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| 400.0 | 0.00 | 0.00 | 400.0 | 0.0 | 0.0 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| 500.0 | 0.00 | 0.00 | 500.0 | 0.0 | 0.0 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| 600.0 | 0.00 | 0.00 | 600.0 | 0.0 | 0.0 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| 700.0 | 0.00 | 0.00 | 700.0 | 0.0 | 0.0 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| 800.0 | 0.00 | 0.00 | 800.0 | 0.0 | 0.0 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| 900.0 | 0.00 | 0.00 | 900.0 | 0.0 | 0.0 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| 1,000.0 | 0.00 | 0.00 | 1,000.0 | 0.0 | 0.0 | 511,989.14 | 576,702.08 | 32° 24' 26.905 N | 104° 13' 7.464 W |
| **Start Build 2.00** | | | | | | | | | |
| 1,100.0 | 2.00 | 316.50 | 1,100.0 | 1.3 | -1.2 | 511,990.41 | 576,700.88 | 32° 24' 26.917 N | 104° 13' 7.478 W |
| 1,200.0 | 4.00 | 316.50 | 1,199.8 | 5.1 | -4.8 | 511,994.20 | 576,697.28 | 32° 24' 26.955 N | 104° 13' 7.520 W |
| 1,300.0 | 6.00 | 316.50 | 1,299.5 | 11.4 | -10.8 | 512,000.52 | 576,691.28 | 32° 24' 27.018 N | 104° 13' 7.590 W |
| 1,333.5 | 6.67 | 316.50 | 1,332.7 | 14.1 | -13.3 | 512,003.20 | 576,688.74 | 32° 24' 27.044 N | 104° 13' 7.620 W |
| **Start 6609.3 hold at 1333.5 MD** | | | | | | | | | |
| 1,400.0 | 6.67 | 316.50 | 1,398.8 | 19.7 | -18.7 | 512,008.81 | 576,683.42 | 32° 24' 27.100 N | 104° 13' 7.681 W |
| 1,500.0 | 6.67 | 316.50 | 1,498.1 | 28.1 | -26.7 | 512,017.23 | 576,675.42 | 32° 24' 27.183 N | 104° 13' 7.775 W |
| 1,600.0 | 6.67 | 316.50 | 1,597.4 | 36.5 | -34.7 | 512,025.66 | 576,667.43 | 32° 24' 27.267 N | 104° 13' 7.868 W |
| 1,700.0 | 6.67 | 316.50 | 1,696.8 | 44.9 | -42.6 | 512,034.08 | 576,659.43 | 32° 24' 27.350 N | 104° 13' 7.961 W |
| 1,800.0 | 6.67 | 316.50 | 1,796.1 | 53.4 | -50.6 | 512,042.51 | 576,651.44 | 32° 24' 27.434 N | 104° 13' 8.054 W |
| 1,900.0 | 6.67 | 316.50 | 1,895.4 | 61.8 | -58.6 | 512,050.93 | 576,643.44 | 32° 24' 27.517 N | 104° 13' 8.147 W |
| 2,000.0 | 6.67 | 316.50 | 1,994.7 | 70.2 | -66.6 | 512,059.36 | 576,635.45 | 32° 24' 27.600 N | 104° 13' 8.240 W |
| 2,100.0 | 6.67 | 316.50 | 2,094.1 | 78.6 | -74.6 | 512,067.78 | 576,627.45 | 32° 24' 27.684 N | 104° 13' 8.334 W |
| 2,200.0 | 6.67 | 316.50 | 2,193.4 | 87.1 | -82.6 | 512,076.21 | 576,619.46 | 32° 24' 27.767 N | 104° 13' 8.427 W |
| 2,300.0 | 6.67 | 316.50 | 2,292.7 | 95.5 | -90.6 | 512,084.63 | 576,611.46 | 32° 24' 27.851 N | 104° 13' 8.520 W |
| 2,400.0 | 6.67 | 316.50 | 2,392.0 | 103.9 | -98.6 | 512,093.05 | 576,603.47 | 32° 24' 27.934 N | 104° 13' 8.613 W |
| 2,500.0 | 6.67 | 316.50 | 2,491.4 | 112.3 | -106.6 | 512,101.48 | 576,595.47 | 32° 24' 28.018 N | 104° 13' 8.706 W |
| 2,600.0 | 6.67 | 316.50 | 2,590.7 | 120.8 | -114.6 | 512,109.90 | 576,587.48 | 32° 24' 28.101 N | 104° 13' 8.799 W |
| 2,700.0 | 6.67 | 316.50 | 2,690.0 | 129.2 | -122.6 | 512,118.33 | 576,579.48 | 32° 24' 28.185 N | 104° 13' 8.893 W |
| 2,800.0 | 6.67 | 316.50 | 2,789.3 | 137.6 | -130.6 | 512,126.75 | 576,571.49 | 32° 24' 28.268 N | 104° 13' 8.986 W |
| 2,900.0 | 6.67 | 316.50 | 2,888.6 | 146.0 | -138.6 | 512,135.18 | 576,563.49 | 32° 24' 28.352 N | 104° 13' 9.079 W |
| 3,000.0 | 6.67 | 316.50 | 2,988.0 | 154.5 | -146.6 | 512,143.60 | 576,555.50 | 32° 24' 28.435 N | 104° 13' 9.172 W |
| 3,100.0 | 6.67 | 316.50 | 3,087.3 | 162.9 | -154.6 | 512,152.03 | 576,547.50 | 32° 24' 28.518 N | 104° 13' 9.265 W |
| 3,200.0 | 6.67 | 316.50 | 3,186.6 | 171.3 | -162.6 | 512,160.45 | 576,539.51 | 32° 24' 28.602 N | 104° 13' 9.358 W |
| 3,300.0 | 6.67 | 316.50 | 3,285.9 | 179.7 | -170.6 | 512,168.88 | 576,531.51 | 32° 24' 28.685 N | 104° 13' 9.451 W |
| 3,400.0 | 6.67 | 316.50 | 3,385.3 | 188.2 | -178.6 | 512,177.30 | 576,523.52 | 32° 24' 28.769 N | 104° 13' 9.545 W |
| 3,500.0 | 6.67 | 316.50 | 3,484.6 | 196.6 | -186.6 | 512,185.72 | 576,515.52 | 32° 24' 28.852 N | 104° 13' 9.638 W |
| 3,600.0 | 6.67 | 316.50 | 3,583.9 | 205.0 | -194.6 | 512,194.15 | 576,507.53 | 32° 24' 28.936 N | 104° 13' 9.731 W |
| 3,700.0 | 6.67 | 316.50 | 3,683.2 | 213.4 | -202.5 | 512,202.57 | 576,499.53 | 32° 24' 29.019 N | 104° 13' 9.824 W |
| 3,800.0 | 6.67 | 316.50 | 3,782.6 | 221.9 | -210.5 | 512,211.00 | 576,491.54 | 32° 24' 29.103 N | 104° 13' 9.917 W |
| 3,900.0 | 6.67 | 316.50 | 3,881.9 | 230.3 | -218.5 | 512,219.42 | 576,483.54 | 32° 24' 29.186 N | 104° 13' 10.010 W |
| 4,000.0 | 6.67 | 316.50 | 3,981.2 | 238.7 | -226.5 | 512,227.85 | 576,475.55 | 32° 24' 29.269 N | 104° 13' 10.104 W |
| 4,100.0 | 6.67 | 316.50 | 4,080.5 | 247.1 | -234.5 | 512,236.27 | 576,467.56 | 32° 24' 29.353 N | 104° 13' 10.197 W |
| 4,200.0 | 6.67 | 316.50 | 4,179.8 | 255.6 | -242.5 | 512,244.70 | 576,459.56 | 32° 24' 29.436 N | 104° 13' 10.290 W |
| 4,300.0 | 6.67 | 316.50 | 4,279.2 | 264.0 | -250.5 | 512,253.12 | 576,451.57 | 32° 24' 29.520 N | 104° 13' 10.383 W |
| 4,400.0 | 6.67 | 316.50 | 4,378.5 | 272.4 | -258.5 | 512,261.55 | 576,443.57 | 32° 24' 29.603 N | 104° 13' 10.476 W |
| 4,500.0 | 6.67 | 316.50 | 4,477.8 | 280.8 | -266.5 | 512,269.97 | 576,435.58 | 32° 24' 29.687 N | 104° 13' 10.569 W |
| 4,600.0 | 6.67 | 316.50 | 4,577.1 | 289.3 | -274.5 | 512,278.40 | 576,427.58 | 32° 24' 29.770 N | 104° 13' 10.663 W |
| 4,700.0 | 6.67 | 316.50 | 4,676.5 | 297.7 | -282.5 | 512,286.82 | 576,419.59 | 32° 24' 29.854 N | 104° 13' 10.756 W |
| 4,800.0 | 6.67 | 316.50 | 4,775.8 | 306.1 | -290.5 | 512,295.24 | 576,411.59 | 32° 24' 29.937 N | 104° 13' 10.849 W |
| 4,900.0 | 6.67 | 316.50 | 4,875.1 | 314.5 | -298.5 | 512,303.67 | 576,403.60 | 32° 24' 30.021 N | 104° 13' 10.942 W |
| 5,000.0 | 6.67 | 316.50 | 4,974.4 | 323.0 | -306.5 | 512,312.09 | 576,395.60 | 32° 24' 30.104 N | 104° 13' 11.035 W |

PERMIAN RESOURCES

Planning Report - Geographic

| | | | |
|---|---|---|---|
| **Database:** | Compass_17 | **Local Co-ordinate Reference:** | Well CAVEMAN 222H |
| **Company:** | NEW MEXICO | **TVD Reference:** | KB @ 3130.0usft |
| **Project:** | (SP) EDDY | **MD Reference:** | KB @ 3130.0usft |
| **Site:** | CAVEMAN PROJECT | **North Reference:** | Grid |
| **Well:** | CAVEMAN 222H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | OWB | | |
| **Design:** | PWP0 | | |

**Planned Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 5,100.0 | 6.67 | 316.50 | 5,073.8 | 331.4 | -314.5 | 512,320.52 | 576,387.61 | 32° 24' 30.187 N | 104° 13' 11.128 W |
| 5,200.0 | 6.67 | 316.50 | 5,173.1 | 339.8 | -322.5 | 512,328.94 | 576,379.61 | 32° 24' 30.271 N | 104° 13' 11.221 W |
| 5,300.0 | 6.67 | 316.50 | 5,272.4 | 348.2 | -330.5 | 512,337.37 | 576,371.62 | 32° 24' 30.354 N | 104° 13' 11.315 W |
| 5,400.0 | 6.67 | 316.50 | 5,371.7 | 356.7 | -338.5 | 512,345.79 | 576,363.62 | 32° 24' 30.438 N | 104° 13' 11.408 W |
| 5,500.0 | 6.67 | 316.50 | 5,471.1 | 365.1 | -346.5 | 512,354.22 | 576,355.63 | 32° 24' 30.521 N | 104° 13' 11.501 W |
| 5,600.0 | 6.67 | 316.50 | 5,570.4 | 373.5 | -354.5 | 512,362.64 | 576,347.63 | 32° 24' 30.605 N | 104° 13' 11.594 W |
| 5,700.0 | 6.67 | 316.50 | 5,669.7 | 381.9 | -362.4 | 512,371.07 | 576,339.64 | 32° 24' 30.688 N | 104° 13' 11.687 W |
| 5,800.0 | 6.67 | 316.50 | 5,769.0 | 390.3 | -370.4 | 512,379.49 | 576,331.64 | 32° 24' 30.772 N | 104° 13' 11.780 W |
| 5,900.0 | 6.67 | 316.50 | 5,868.3 | 398.8 | -378.4 | 512,387.91 | 576,323.65 | 32° 24' 30.855 N | 104° 13' 11.874 W |
| 6,000.0 | 6.67 | 316.50 | 5,967.7 | 407.2 | -386.4 | 512,396.34 | 576,315.65 | 32° 24' 30.939 N | 104° 13' 11.967 W |
| 6,100.0 | 6.67 | 316.50 | 6,067.0 | 415.6 | -394.4 | 512,404.76 | 576,307.66 | 32° 24' 31.022 N | 104° 13' 12.060 W |
| 6,200.0 | 6.67 | 316.50 | 6,166.3 | 424.0 | -402.4 | 512,413.19 | 576,299.66 | 32° 24' 31.105 N | 104° 13' 12.153 W |
| 6,300.0 | 6.67 | 316.50 | 6,265.6 | 432.5 | -410.4 | 512,421.61 | 576,291.67 | 32° 24' 31.189 N | 104° 13' 12.246 W |
| 6,400.0 | 6.67 | 316.50 | 6,365.0 | 440.9 | -418.4 | 512,430.04 | 576,283.67 | 32° 24' 31.272 N | 104° 13' 12.339 W |
| 6,500.0 | 6.67 | 316.50 | 6,464.3 | 449.3 | -426.4 | 512,438.46 | 576,275.68 | 32° 24' 31.356 N | 104° 13' 12.433 W |
| 6,600.0 | 6.67 | 316.50 | 6,563.6 | 457.7 | -434.4 | 512,446.89 | 576,267.68 | 32° 24' 31.439 N | 104° 13' 12.526 W |
| 6,700.0 | 6.67 | 316.50 | 6,662.9 | 466.2 | -442.4 | 512,455.31 | 576,259.69 | 32° 24' 31.523 N | 104° 13' 12.619 W |
| 6,800.0 | 6.67 | 316.50 | 6,762.3 | 474.6 | -450.4 | 512,463.74 | 576,251.69 | 32° 24' 31.606 N | 104° 13' 12.712 W |
| 6,900.0 | 6.67 | 316.50 | 6,861.6 | 483.0 | -458.4 | 512,472.16 | 576,243.70 | 32° 24' 31.690 N | 104° 13' 12.805 W |
| 7,000.0 | 6.67 | 316.50 | 6,960.9 | 491.4 | -466.4 | 512,480.59 | 576,235.70 | 32° 24' 31.773 N | 104° 13' 12.898 W |
| 7,100.0 | 6.67 | 316.50 | 7,060.2 | 499.9 | -474.4 | 512,489.01 | 576,227.71 | 32° 24' 31.856 N | 104° 13' 12.992 W |
| 7,200.0 | 6.67 | 316.50 | 7,159.5 | 508.3 | -482.4 | 512,497.43 | 576,219.71 | 32° 24' 31.940 N | 104° 13' 13.085 W |
| 7,300.0 | 6.67 | 316.50 | 7,258.9 | 516.7 | -490.4 | 512,505.86 | 576,211.72 | 32° 24' 32.023 N | 104° 13' 13.178 W |
| 7,400.0 | 6.67 | 316.50 | 7,358.2 | 525.1 | -498.4 | 512,514.28 | 576,203.72 | 32° 24' 32.107 N | 104° 13' 13.271 W |
| 7,500.0 | 6.67 | 316.50 | 7,457.5 | 533.6 | -506.4 | 512,522.71 | 576,195.73 | 32° 24' 32.190 N | 104° 13' 13.364 W |
| 7,600.0 | 6.67 | 316.50 | 7,556.8 | 542.0 | -514.4 | 512,531.13 | 576,187.73 | 32° 24' 32.274 N | 104° 13' 13.457 W |
| 7,700.0 | 6.67 | 316.50 | 7,656.2 | 550.4 | -522.3 | 512,539.56 | 576,179.74 | 32° 24' 32.357 N | 104° 13' 13.550 W |
| 7,800.0 | 6.67 | 316.50 | 7,755.5 | 558.8 | -530.3 | 512,547.98 | 576,171.74 | 32° 24' 32.441 N | 104° 13' 13.644 W |
| 7,900.0 | 6.67 | 316.50 | 7,854.8 | 567.3 | -538.3 | 512,556.41 | 576,163.75 | 32° 24' 32.524 N | 104° 13' 13.737 W |
| 7,942.8 | 6.67 | 316.50 | 7,897.3 | 570.9 | -541.8 | 512,560.01 | 576,160.33 | 32° 24' 32.560 N | 104° 13' 13.777 W |
| **Start Drop -2.00** | | | | | | | | | |
| 8,000.0 | 5.52 | 316.50 | 7,954.2 | 575.3 | -545.9 | 512,564.42 | 576,156.14 | 32° 24' 32.603 N | 104° 13' 13.825 W |
| 8,100.0 | 3.52 | 316.50 | 8,053.9 | 581.0 | -551.4 | 512,570.14 | 576,150.71 | 32° 24' 32.660 N | 104° 13' 13.889 W |
| 8,200.0 | 1.52 | 316.50 | 8,153.8 | 584.2 | -554.4 | 512,573.34 | 576,147.68 | 32° 24' 32.692 N | 104° 13' 13.924 W |
| 8,276.2 | 0.00 | 0.00 | 8,230.0 | 584.9 | -555.1 | 512,574.07 | 576,146.98 | 32° 24' 32.699 N | 104° 13' 13.932 W |
| **Start 68.5 hold at 8276.2 MD** | | | | | | | | | |
| 8,300.0 | 0.00 | 0.00 | 8,253.8 | 584.9 | -555.1 | 512,574.07 | 576,146.98 | 32° 24' 32.699 N | 104° 13' 13.932 W |
| 8,344.7 | 0.00 | 0.00 | 8,298.5 | 584.9 | -555.1 | 512,574.07 | 576,146.98 | 32° 24' 32.699 N | 104° 13' 13.932 W |
| **Start DLS 12.00 TFO 269.86** | | | | | | | | | |
| 8,350.0 | 0.63 | 269.86 | 8,303.8 | 584.9 | -555.1 | 512,574.07 | 576,146.95 | 32° 24' 32.699 N | 104° 13' 13.933 W |
| 8,375.0 | 3.63 | 269.86 | 8,328.7 | 584.9 | -556.1 | 512,574.07 | 576,146.02 | 32° 24' 32.699 N | 104° 13' 13.943 W |
| 8,400.0 | 6.63 | 269.86 | 8,353.6 | 584.9 | -558.3 | 512,574.06 | 576,143.79 | 32° 24' 32.699 N | 104° 13' 13.969 W |
| 8,425.0 | 9.63 | 269.86 | 8,378.4 | 584.9 | -561.8 | 512,574.06 | 576,140.25 | 32° 24' 32.699 N | 104° 13' 14.011 W |
| 8,450.0 | 12.63 | 269.86 | 8,402.9 | 584.9 | -566.7 | 512,574.04 | 576,135.43 | 32° 24' 32.699 N | 104° 13' 14.067 W |
| 8,475.0 | 15.63 | 269.86 | 8,427.2 | 584.9 | -572.8 | 512,574.03 | 576,129.32 | 32° 24' 32.699 N | 104° 13' 14.138 W |
| 8,500.0 | 18.63 | 269.86 | 8,451.0 | 584.9 | -580.1 | 512,574.01 | 576,121.96 | 32° 24' 32.699 N | 104° 13' 14.224 W |
| 8,525.0 | 21.63 | 269.86 | 8,474.5 | 584.9 | -588.7 | 512,573.99 | 576,113.36 | 32° 24' 32.699 N | 104° 13' 14.324 W |
| 8,550.0 | 24.63 | 269.86 | 8,497.5 | 584.8 | -598.5 | 512,573.97 | 576,103.54 | 32° 24' 32.698 N | 104° 13' 14.439 W |
| 8,575.0 | 27.63 | 269.86 | 8,519.9 | 584.8 | -609.6 | 512,573.94 | 576,092.53 | 32° 24' 32.698 N | 104° 13' 14.567 W |
| 8,600.0 | 30.63 | 269.86 | 8,541.8 | 584.8 | -621.7 | 512,573.91 | 576,080.36 | 32° 24' 32.698 N | 104° 13' 14.709 W |
| 8,625.0 | 33.63 | 269.86 | 8,562.9 | 584.7 | -635.0 | 512,573.88 | 576,067.06 | 32° 24' 32.698 N | 104° 13' 14.864 W |
| 8,650.0 | 36.63 | 269.86 | 8,583.4 | 584.7 | -649.4 | 512,573.85 | 576,052.68 | 32° 24' 32.698 N | 104° 13' 15.032 W |
| 8,675.0 | 39.63 | 269.86 | 8,603.1 | 584.7 | -664.8 | 512,573.81 | 576,037.24 | 32° 24' 32.698 N | 104° 13' 15.212 W |
| 8,700.0 | 42.63 | 269.86 | 8,621.9 | 584.6 | -681.3 | 512,573.77 | 576,020.80 | 32° 24' 32.697 N | 104° 13' 15.404 W |

PERMIAN RESOURCES

Planning Report - Geographic

| | | | |
|---|---|---|---|
| **Database:** | Compass_17 | **Local Co-ordinate Reference:** | Well CAVEMAN 222H |
| **Company:** | NEW MEXICO | **TVD Reference:** | KB @ 3130.0usft |
| **Project:** | (SP) EDDY | **MD Reference:** | KB @ 3130.0usft |
| **Site:** | CAVEMAN PROJECT | **North Reference:** | Grid |
| **Well:** | CAVEMAN 222H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | OWB | | |
| **Design:** | PWP0 | | |

**Planned Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 8,725.0 | 45.63 | 269.86 | 8,639.8 | 584.6 | -698.7 | 512,573.73 | 576,003.39 | 32° 24' 32.697 N | 104° 13' 15.607 W |
| 8,750.0 | 48.63 | 269.86 | 8,656.8 | 584.5 | -717.0 | 512,573.69 | 575,985.07 | 32° 24' 32.697 N | 104° 13' 15.821 W |
| 8,775.0 | 51.63 | 269.86 | 8,672.9 | 584.5 | -736.2 | 512,573.64 | 575,965.89 | 32° 24' 32.697 N | 104° 13' 16.045 W |
| 8,800.0 | 54.63 | 269.86 | 8,687.8 | 584.5 | -756.2 | 512,573.59 | 575,945.89 | 32° 24' 32.696 N | 104° 13' 16.278 W |
| 8,825.0 | 57.63 | 269.86 | 8,701.8 | 584.4 | -777.0 | 512,573.54 | 575,925.13 | 32° 24' 32.696 N | 104° 13' 16.520 W |
| 8,850.0 | 60.63 | 269.86 | 8,714.6 | 584.4 | -798.4 | 512,573.49 | 575,903.68 | 32° 24' 32.696 N | 104° 13' 16.770 W |
| 8,875.0 | 63.63 | 269.86 | 8,726.3 | 584.3 | -820.5 | 512,573.44 | 575,881.58 | 32° 24' 32.696 N | 104° 13' 17.028 W |
| 8,900.0 | 66.63 | 269.86 | 8,736.8 | 584.2 | -843.2 | 512,573.39 | 575,858.90 | 32° 24' 32.695 N | 104° 13' 17.293 W |
| 8,925.0 | 69.63 | 269.86 | 8,746.1 | 584.2 | -866.4 | 512,573.33 | 575,835.70 | 32° 24' 32.695 N | 104° 13' 17.563 W |
| 8,950.0 | 72.63 | 269.86 | 8,754.2 | 584.1 | -890.0 | 512,573.28 | 575,812.05 | 32° 24' 32.695 N | 104° 13' 17.839 W |
| 8,975.0 | 75.63 | 269.86 | 8,761.0 | 584.1 | -914.1 | 512,573.22 | 575,788.00 | 32° 24' 32.694 N | 104° 13' 18.120 W |
| 9,000.0 | 78.63 | 269.86 | 8,766.6 | 584.0 | -938.5 | 512,573.16 | 575,763.63 | 32° 24' 32.694 N | 104° 13' 18.404 W |
| 9,025.0 | 81.63 | 269.86 | 8,770.9 | 584.0 | -963.1 | 512,573.10 | 575,739.01 | 32° 24' 32.694 N | 104° 13' 18.691 W |
| 9,050.0 | 84.63 | 269.86 | 8,773.9 | 583.9 | -987.9 | 512,573.04 | 575,714.19 | 32° 24' 32.693 N | 104° 13' 18.981 W |
| 9,075.0 | 87.63 | 269.86 | 8,775.6 | 583.8 | -1,012.8 | 512,572.98 | 575,689.25 | 32° 24' 32.693 N | 104° 13' 19.272 W |
| 9,094.7 | 90.00 | 269.86 | 8,776.0 | 583.8 | -1,032.6 | 512,572.94 | 575,669.52 | 32° 24' 32.693 N | 104° 13' 19.502 W |
| **Start 9838.5 hold at 9094.7 MD** | | | | | | | | | |
| 9,100.0 | 90.00 | 269.86 | 8,776.0 | 583.8 | -1,037.8 | 512,572.92 | 575,664.25 | 32° 24' 32.693 N | 104° 13' 19.563 W |
| 9,200.0 | 90.00 | 269.86 | 8,776.0 | 583.5 | -1,137.8 | 512,572.69 | 575,564.25 | 32° 24' 32.691 N | 104° 13' 20.730 W |
| 9,300.0 | 90.00 | 269.86 | 8,776.0 | 583.3 | -1,237.8 | 512,572.45 | 575,464.25 | 32° 24' 32.690 N | 104° 13' 21.897 W |
| 9,400.0 | 90.00 | 269.86 | 8,776.0 | 583.1 | -1,337.8 | 512,572.21 | 575,364.25 | 32° 24' 32.689 N | 104° 13' 23.063 W |
| 9,500.0 | 90.00 | 269.86 | 8,776.0 | 582.8 | -1,437.8 | 512,571.97 | 575,264.25 | 32° 24' 32.687 N | 104° 13' 24.230 W |
| 9,600.0 | 90.00 | 269.86 | 8,776.0 | 582.6 | -1,537.8 | 512,571.73 | 575,164.25 | 32° 24' 32.686 N | 104° 13' 25.396 W |
| 9,700.0 | 90.00 | 269.86 | 8,776.0 | 582.4 | -1,637.8 | 512,571.50 | 575,064.25 | 32° 24' 32.685 N | 104° 13' 26.563 W |
| 9,800.0 | 90.00 | 269.86 | 8,776.0 | 582.1 | -1,737.8 | 512,571.26 | 574,964.26 | 32° 24' 32.683 N | 104° 13' 27.729 W |
| 9,900.0 | 90.00 | 269.86 | 8,776.0 | 581.9 | -1,837.8 | 512,571.02 | 574,864.26 | 32° 24' 32.682 N | 104° 13' 28.896 W |
| 10,000.0 | 90.00 | 269.86 | 8,776.0 | 581.6 | -1,937.8 | 512,570.78 | 574,764.26 | 32° 24' 32.681 N | 104° 13' 30.062 W |
| 10,100.0 | 90.00 | 269.86 | 8,776.0 | 581.4 | -2,037.8 | 512,570.55 | 574,664.26 | 32° 24' 32.679 N | 104° 13' 31.229 W |
| 10,200.0 | 90.00 | 269.86 | 8,776.0 | 581.2 | -2,137.8 | 512,570.31 | 574,564.26 | 32° 24' 32.678 N | 104° 13' 32.395 W |
| 10,300.0 | 90.00 | 269.86 | 8,776.0 | 580.9 | -2,237.8 | 512,570.07 | 574,464.26 | 32° 24' 32.677 N | 104° 13' 33.562 W |
| 10,400.0 | 90.00 | 269.86 | 8,776.0 | 580.7 | -2,337.8 | 512,569.83 | 574,364.26 | 32° 24' 32.675 N | 104° 13' 34.728 W |
| 10,500.0 | 90.00 | 269.86 | 8,776.0 | 580.5 | -2,437.8 | 512,569.59 | 574,264.26 | 32° 24' 32.674 N | 104° 13' 35.895 W |
| 10,600.0 | 90.00 | 269.86 | 8,776.0 | 580.2 | -2,537.8 | 512,569.36 | 574,164.26 | 32° 24' 32.673 N | 104° 13' 37.062 W |
| 10,700.0 | 90.00 | 269.86 | 8,776.0 | 580.0 | -2,637.8 | 512,569.12 | 574,064.26 | 32° 24' 32.671 N | 104° 13' 38.228 W |
| 10,800.0 | 90.00 | 269.86 | 8,776.0 | 579.7 | -2,737.8 | 512,568.88 | 573,964.26 | 32° 24' 32.670 N | 104° 13' 39.395 W |
| 10,900.0 | 90.00 | 269.86 | 8,776.0 | 579.5 | -2,837.8 | 512,568.64 | 573,864.26 | 32° 24' 32.668 N | 104° 13' 40.561 W |
| 11,000.0 | 90.00 | 269.86 | 8,776.0 | 579.3 | -2,937.8 | 512,568.41 | 573,764.26 | 32° 24' 32.667 N | 104° 13' 41.728 W |
| 11,100.0 | 90.00 | 269.86 | 8,776.0 | 579.0 | -3,037.8 | 512,568.17 | 573,664.26 | 32° 24' 32.666 N | 104° 13' 42.894 W |
| 11,200.0 | 90.00 | 269.86 | 8,776.0 | 578.8 | -3,137.8 | 512,567.93 | 573,564.26 | 32° 24' 32.664 N | 104° 13' 44.061 W |
| 11,300.0 | 90.00 | 269.86 | 8,776.0 | 578.6 | -3,237.8 | 512,567.69 | 573,464.26 | 32° 24' 32.663 N | 104° 13' 45.227 W |
| 11,400.0 | 90.00 | 269.86 | 8,776.0 | 578.3 | -3,337.8 | 512,567.45 | 573,364.26 | 32° 24' 32.661 N | 104° 13' 46.394 W |
| 11,500.0 | 90.00 | 269.86 | 8,776.0 | 578.1 | -3,437.8 | 512,567.22 | 573,264.26 | 32° 24' 32.660 N | 104° 13' 47.560 W |
| 11,600.0 | 90.00 | 269.86 | 8,776.0 | 577.8 | -3,537.8 | 512,566.98 | 573,164.26 | 32° 24' 32.659 N | 104° 13' 48.727 W |
| 11,700.0 | 90.00 | 269.86 | 8,776.0 | 577.6 | -3,637.8 | 512,566.74 | 573,064.26 | 32° 24' 32.657 N | 104° 13' 49.893 W |
| 11,800.0 | 90.00 | 269.86 | 8,776.0 | 577.4 | -3,737.8 | 512,566.50 | 572,964.26 | 32° 24' 32.656 N | 104° 13' 51.060 W |
| 11,900.0 | 90.00 | 269.86 | 8,776.0 | 577.1 | -3,837.8 | 512,566.27 | 572,864.26 | 32° 24' 32.654 N | 104° 13' 52.227 W |
| 12,000.0 | 90.00 | 269.86 | 8,776.0 | 576.9 | -3,937.8 | 512,566.03 | 572,764.26 | 32° 24' 32.653 N | 104° 13' 53.393 W |
| 12,100.0 | 90.00 | 269.86 | 8,776.0 | 576.6 | -4,037.8 | 512,565.79 | 572,664.26 | 32° 24' 32.652 N | 104° 13' 54.560 W |
| 12,200.0 | 90.00 | 269.86 | 8,776.0 | 576.4 | -4,137.8 | 512,565.55 | 572,564.26 | 32° 24' 32.650 N | 104° 13' 55.726 W |
| 12,300.0 | 90.00 | 269.86 | 8,776.0 | 576.2 | -4,237.8 | 512,565.31 | 572,464.26 | 32° 24' 32.649 N | 104° 13' 56.893 W |
| 12,400.0 | 90.00 | 269.86 | 8,776.0 | 575.9 | -4,337.8 | 512,565.08 | 572,364.26 | 32° 24' 32.647 N | 104° 13' 58.059 W |
| 12,500.0 | 90.00 | 269.86 | 8,776.0 | 575.7 | -4,437.8 | 512,564.84 | 572,264.26 | 32° 24' 32.646 N | 104° 13' 59.226 W |
| 12,600.0 | 90.00 | 269.86 | 8,776.0 | 575.5 | -4,537.8 | 512,564.60 | 572,164.26 | 32° 24' 32.645 N | 104° 14' 0.392 W |
| 12,700.0 | 90.00 | 269.86 | 8,776.0 | 575.2 | -4,637.8 | 512,564.36 | 572,064.26 | 32° 24' 32.643 N | 104° 14' 1.559 W |

PERMIAN RESOURCES

Planning Report - Geographic

| | | | |
|---|---|---|---|
| **Database:** | Compass_17 | **Local Co-ordinate Reference:** | Well CAVEMAN 222H |
| **Company:** | NEW MEXICO | **TVD Reference:** | KB @ 3130.0usft |
| **Project:** | (SP) EDDY | **MD Reference:** | KB @ 3130.0usft |
| **Site:** | CAVEMAN PROJECT | **North Reference:** | Grid |
| **Well:** | CAVEMAN 222H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | OWB | | |
| **Design:** | PWP0 | | |

**Planned Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 12,800.0 | 90.00 | 269.86 | 8,776.0 | 575.0 | -4,737.8 | 512,564.13 | 571,964.26 | 32° 24' 32.642 N | 104° 14' 2.725 W |
| 12,900.0 | 90.00 | 269.86 | 8,776.0 | 574.7 | -4,837.8 | 512,563.89 | 571,864.26 | 32° 24' 32.640 N | 104° 14' 3.892 W |
| 13,000.0 | 90.00 | 269.86 | 8,776.0 | 574.5 | -4,937.8 | 512,563.65 | 571,764.26 | 32° 24' 32.639 N | 104° 14' 5.059 W |
| 13,100.0 | 90.00 | 269.86 | 8,776.0 | 574.3 | -5,037.8 | 512,563.41 | 571,664.26 | 32° 24' 32.637 N | 104° 14' 6.225 W |
| 13,200.0 | 90.00 | 269.86 | 8,776.0 | 574.0 | -5,137.8 | 512,563.17 | 571,564.26 | 32° 24' 32.636 N | 104° 14' 7.392 W |
| 13,300.0 | 90.00 | 269.86 | 8,776.0 | 573.8 | -5,237.8 | 512,562.94 | 571,464.27 | 32° 24' 32.634 N | 104° 14' 8.558 W |
| 13,400.0 | 90.00 | 269.86 | 8,776.0 | 573.6 | -5,337.8 | 512,562.70 | 571,364.27 | 32° 24' 32.633 N | 104° 14' 9.725 W |
| 13,500.0 | 90.00 | 269.86 | 8,776.0 | 573.3 | -5,437.8 | 512,562.46 | 571,264.27 | 32° 24' 32.632 N | 104° 14' 10.891 W |
| 13,600.0 | 90.00 | 269.86 | 8,776.0 | 573.1 | -5,537.8 | 512,562.22 | 571,164.27 | 32° 24' 32.630 N | 104° 14' 12.058 W |
| 13,700.0 | 90.00 | 269.86 | 8,776.0 | 572.8 | -5,637.8 | 512,561.99 | 571,064.27 | 32° 24' 32.629 N | 104° 14' 13.224 W |
| 13,800.0 | 90.00 | 269.86 | 8,776.0 | 572.6 | -5,737.8 | 512,561.75 | 570,964.27 | 32° 24' 32.627 N | 104° 14' 14.391 W |
| 13,900.0 | 90.00 | 269.86 | 8,776.0 | 572.4 | -5,837.8 | 512,561.51 | 570,864.27 | 32° 24' 32.626 N | 104° 14' 15.557 W |
| 14,000.0 | 90.00 | 269.86 | 8,776.0 | 572.1 | -5,937.8 | 512,561.27 | 570,764.27 | 32° 24' 32.624 N | 104° 14' 16.724 W |
| 14,100.0 | 90.00 | 269.86 | 8,776.0 | 571.9 | -6,037.8 | 512,561.03 | 570,664.27 | 32° 24' 32.623 N | 104° 14' 17.890 W |
| 14,200.0 | 90.00 | 269.86 | 8,776.0 | 571.7 | -6,137.8 | 512,560.80 | 570,564.27 | 32° 24' 32.621 N | 104° 14' 19.057 W |
| 14,300.0 | 90.00 | 269.86 | 8,776.0 | 571.4 | -6,237.8 | 512,560.56 | 570,464.27 | 32° 24' 32.620 N | 104° 14' 20.224 W |
| 14,400.0 | 90.00 | 269.86 | 8,776.0 | 571.2 | -6,337.8 | 512,560.32 | 570,364.27 | 32° 24' 32.618 N | 104° 14' 21.390 W |
| 14,500.0 | 90.00 | 269.86 | 8,776.0 | 570.9 | -6,437.8 | 512,560.08 | 570,264.27 | 32° 24' 32.617 N | 104° 14' 22.557 W |
| 14,600.0 | 90.00 | 269.86 | 8,776.0 | 570.7 | -6,537.8 | 512,559.85 | 570,164.27 | 32° 24' 32.615 N | 104° 14' 23.723 W |
| 14,700.0 | 90.00 | 269.86 | 8,776.0 | 570.5 | -6,637.8 | 512,559.61 | 570,064.27 | 32° 24' 32.614 N | 104° 14' 24.890 W |
| 14,800.0 | 90.00 | 269.86 | 8,776.0 | 570.2 | -6,737.8 | 512,559.37 | 569,964.27 | 32° 24' 32.612 N | 104° 14' 26.056 W |
| 14,900.0 | 90.00 | 269.86 | 8,776.0 | 570.0 | -6,837.8 | 512,559.13 | 569,864.27 | 32° 24' 32.611 N | 104° 14' 27.223 W |
| 15,000.0 | 90.00 | 269.86 | 8,776.0 | 569.8 | -6,937.8 | 512,558.89 | 569,764.27 | 32° 24' 32.609 N | 104° 14' 28.389 W |
| 15,100.0 | 90.00 | 269.86 | 8,776.0 | 569.5 | -7,037.8 | 512,558.66 | 569,664.27 | 32° 24' 32.608 N | 104° 14' 29.556 W |
| 15,200.0 | 90.00 | 269.86 | 8,776.0 | 569.3 | -7,137.8 | 512,558.42 | 569,564.27 | 32° 24' 32.606 N | 104° 14' 30.722 W |
| 15,300.0 | 90.00 | 269.86 | 8,776.0 | 569.0 | -7,237.8 | 512,558.18 | 569,464.27 | 32° 24' 32.605 N | 104° 14' 31.889 W |
| 15,400.0 | 90.00 | 269.86 | 8,776.0 | 568.8 | -7,337.8 | 512,557.94 | 569,364.27 | 32° 24' 32.603 N | 104° 14' 33.056 W |
| 15,500.0 | 90.00 | 269.86 | 8,776.0 | 568.6 | -7,437.8 | 512,557.71 | 569,264.27 | 32° 24' 32.602 N | 104° 14' 34.222 W |
| 15,600.0 | 90.00 | 269.86 | 8,776.0 | 568.3 | -7,537.8 | 512,557.47 | 569,164.27 | 32° 24' 32.600 N | 104° 14' 35.389 W |
| 15,700.0 | 90.00 | 269.86 | 8,776.0 | 568.1 | -7,637.8 | 512,557.23 | 569,064.27 | 32° 24' 32.599 N | 104° 14' 36.555 W |
| 15,800.0 | 90.00 | 269.86 | 8,776.0 | 567.9 | -7,737.8 | 512,556.99 | 568,964.27 | 32° 24' 32.597 N | 104° 14' 37.722 W |
| 15,900.0 | 90.00 | 269.86 | 8,776.0 | 567.6 | -7,837.8 | 512,556.75 | 568,864.27 | 32° 24' 32.596 N | 104° 14' 38.888 W |
| 16,000.0 | 90.00 | 269.86 | 8,776.0 | 567.4 | -7,937.8 | 512,556.52 | 568,764.27 | 32° 24' 32.594 N | 104° 14' 40.055 W |
| 16,100.0 | 90.00 | 269.86 | 8,776.0 | 567.1 | -8,037.8 | 512,556.28 | 568,664.27 | 32° 24' 32.593 N | 104° 14' 41.221 W |
| 16,200.0 | 90.00 | 269.86 | 8,776.0 | 566.9 | -8,137.8 | 512,556.04 | 568,564.27 | 32° 24' 32.591 N | 104° 14' 42.388 W |
| 16,300.0 | 90.00 | 269.86 | 8,776.0 | 566.7 | -8,237.8 | 512,555.80 | 568,464.27 | 32° 24' 32.590 N | 104° 14' 43.554 W |
| 16,400.0 | 90.00 | 269.86 | 8,776.0 | 566.4 | -8,337.8 | 512,555.57 | 568,364.27 | 32° 24' 32.588 N | 104° 14' 44.721 W |
| 16,500.0 | 90.00 | 269.86 | 8,776.0 | 566.2 | -8,437.8 | 512,555.33 | 568,264.27 | 32° 24' 32.587 N | 104° 14' 45.887 W |
| 16,600.0 | 90.00 | 269.86 | 8,776.0 | 565.9 | -8,537.8 | 512,555.09 | 568,164.27 | 32° 24' 32.585 N | 104° 14' 47.054 W |
| 16,700.0 | 90.00 | 269.86 | 8,776.0 | 565.7 | -8,637.8 | 512,554.85 | 568,064.27 | 32° 24' 32.583 N | 104° 14' 48.221 W |
| 16,800.0 | 90.00 | 269.86 | 8,776.0 | 565.5 | -8,737.8 | 512,554.61 | 567,964.27 | 32° 24' 32.582 N | 104° 14' 49.387 W |
| 16,900.0 | 90.00 | 269.86 | 8,776.0 | 565.2 | -8,837.8 | 512,554.38 | 567,864.28 | 32° 24' 32.580 N | 104° 14' 50.554 W |
| 17,000.0 | 90.00 | 269.86 | 8,776.0 | 565.0 | -8,937.8 | 512,554.14 | 567,764.28 | 32° 24' 32.579 N | 104° 14' 51.720 W |
| 17,100.0 | 90.00 | 269.86 | 8,776.0 | 564.8 | -9,037.8 | 512,553.90 | 567,664.28 | 32° 24' 32.577 N | 104° 14' 52.887 W |
| 17,200.0 | 90.00 | 269.86 | 8,776.0 | 564.5 | -9,137.8 | 512,553.66 | 567,564.28 | 32° 24' 32.576 N | 104° 14' 54.053 W |
| 17,300.0 | 90.00 | 269.86 | 8,776.0 | 564.3 | -9,237.8 | 512,553.43 | 567,464.28 | 32° 24' 32.574 N | 104° 14' 55.220 W |
| 17,400.0 | 90.00 | 269.86 | 8,776.0 | 564.0 | -9,337.8 | 512,553.19 | 567,364.28 | 32° 24' 32.573 N | 104° 14' 56.386 W |
| 17,500.0 | 90.00 | 269.86 | 8,776.0 | 563.8 | -9,437.8 | 512,552.95 | 567,264.28 | 32° 24' 32.571 N | 104° 14' 57.553 W |
| 17,600.0 | 90.00 | 269.86 | 8,776.0 | 563.6 | -9,537.8 | 512,552.71 | 567,164.28 | 32° 24' 32.569 N | 104° 14' 58.719 W |
| 17,700.0 | 90.00 | 269.86 | 8,776.0 | 563.3 | -9,637.8 | 512,552.47 | 567,064.28 | 32° 24' 32.568 N | 104° 14' 59.886 W |
| 17,800.0 | 90.00 | 269.86 | 8,776.0 | 563.1 | -9,737.8 | 512,552.24 | 566,964.28 | 32° 24' 32.566 N | 104° 15' 1.053 W |
| 17,900.0 | 90.00 | 269.86 | 8,776.0 | 562.9 | -9,837.8 | 512,552.00 | 566,864.28 | 32° 24' 32.565 N | 104° 15' 2.219 W |
| 18,000.0 | 90.00 | 269.86 | 8,776.0 | 562.6 | -9,937.8 | 512,551.76 | 566,764.28 | 32° 24' 32.563 N | 104° 15' 3.386 W |
| 18,100.0 | 90.00 | 269.86 | 8,776.0 | 562.4 | -10,037.8 | 512,551.52 | 566,664.28 | 32° 24' 32.561 N | 104° 15' 4.552 W |
| 18,200.0 | 90.00 | 269.86 | 8,776.0 | 562.1 | -10,137.8 | 512,551.29 | 566,564.28 | 32° 24' 32.560 N | 104° 15' 5.719 W |

PERMIAN RESOURCES

# Planning Report - Geographic

| | | | |
|---|---|---|---|
| **Database:** | Compass_17 | **Local Co-ordinate Reference:** | Well CAVEMAN 222H |
| **Company:** | NEW MEXICO | **TVD Reference:** | KB @ 3130.0usft |
| **Project:** | (SP) EDDY | **MD Reference:** | KB @ 3130.0usft |
| **Site:** | CAVEMAN PROJECT | **North Reference:** | Grid |
| **Well:** | CAVEMAN 222H | **Survey Calculation Method:** | Minimum Curvature |
| **Wellbore:** | OWB | | |
| **Design:** | PWP0 | | |

**Planned Survey**

| Measured Depth (usft) | Inclination (°) | Azimuth (°) | Vertical Depth (usft) | +N/-S (usft) | +E/-W (usft) | Map Northing (usft) | Map Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| 18,300.0 | 90.00 | 269.86 | 8,776.0 | 561.9 | -10,237.8 | 512,551.05 | 566,464.28 | 32° 24' 32.558 N | 104° 15' 6.885 W |
| 18,400.0 | 90.00 | 269.86 | 8,776.0 | 561.7 | -10,337.8 | 512,550.81 | 566,364.28 | 32° 24' 32.557 N | 104° 15' 8.052 W |
| 18,500.0 | 90.00 | 269.86 | 8,776.0 | 561.4 | -10,437.8 | 512,550.57 | 566,264.28 | 32° 24' 32.555 N | 104° 15' 9.218 W |
| 18,600.0 | 90.00 | 269.86 | 8,776.0 | 561.2 | -10,537.8 | 512,550.33 | 566,164.28 | 32° 24' 32.553 N | 104° 15' 10.385 W |
| 18,700.0 | 90.00 | 269.86 | 8,776.0 | 561.0 | -10,637.8 | 512,550.10 | 566,064.28 | 32° 24' 32.552 N | 104° 15' 11.551 W |
| 18,800.0 | 90.00 | 269.86 | 8,776.0 | 560.7 | -10,737.8 | 512,549.86 | 565,964.28 | 32° 24' 32.550 N | 104° 15' 12.718 W |
| 18,900.0 | 90.00 | 269.86 | 8,776.0 | 560.5 | -10,837.8 | 512,549.62 | 565,864.28 | 32° 24' 32.549 N | 104° 15' 13.884 W |
| 18,933.3 | 90.00 | 269.86 | 8,776.0 | 560.4 | -10,871.1 | 512,549.54 | 565,831.00 | 32° 24' 32.548 N | 104° 15' 14.273 W |
| **TD at 18933.3** | | | | | | | | | |

**Design Targets**

| Target Name - hit/miss target - Shape | Dip Angle (°) | Dip Dir. (°) | TVD (usft) | +N/-S (usft) | +E/-W (usft) | Northing (usft) | Easting (usft) | Latitude | Longitude |
|---|---|---|---|---|---|---|---|---|---|
| BHL-CAVEMAN 222H<br>- plan hits target center<br>- Point | 0.00 | 0.01 | 8,776.0 | 560.4 | -10,871.1 | 512,549.54 | 565,831.00 | 32° 24' 32.548 N | 104° 15' 14.273 W |
| FTP-CAVEMAN 222H<br>- plan misses target center by 47.2usft at 8891.0usft MD (8733.2 TVD, 584.3 N, -835.0 E)<br>- Point | 0.00 | 0.00 | 8,776.0 | 584.9 | -815.1 | 512,574.07 | 575,886.97 | 32° 24' 32.702 N | 104° 13' 16.965 W |

**Plan Annotations**

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 1,000.0 | 1,000.0 | 0.0 | 0.0 | Start Build 2.00 |
| 1,333.5 | 1,332.7 | 14.1 | -13.3 | Start 6609.3 hold at 1333.5 MD |
| 7,942.8 | 7,897.3 | 570.9 | -541.8 | Start Drop -2.00 |
| 8,276.2 | 8,230.0 | 584.9 | -555.1 | Start 68.5 hold at 8276.2 MD |
| 8,344.7 | 8,298.5 | 584.9 | -555.1 | Start DLS 12.00 TFO 269.86 |
| 9,094.7 | 8,776.0 | 583.8 | -1,032.6 | Start 9838.5 hold at 9094.7 MD |
| 18,933.3 | 8,776.0 | 560.4 | -10,871.1 | TD at 18933.3 |

# Permian Resources - Caveman 224H

**1. Geologic Formations**

| Formation | Elevation | TVD | Lithology | Target |
|---|---|---|---|---|
| Rustler | 2855 | 275 | Sandstone | No |
| Top of Salt | NP | NP | Salt | No |
| Lamar | 1370 | 1760 | Anhydrite/Shale | No |
| Capitan | 2780 | 350 | Anhydrite/Shale | No |
| Bell Canyon | 1080 | 2050 | Limestone | No |
| Cherry Canyon | 270 | 2860 | Limestone | No |
| Brushy Canyon | -585 | 3715 | Limestone | No |
| Bone Spring Lime | -2020 | 5150 | Limestone | No |
| 1st Bone Spring Sand | -3211 | 6341 | Sandstone | No |
| 2nd Bone Spring Sand | -3821 | 6951 | Sandstone | No |
| 3rd Bone Spring Sand | -5242 | 8372 | Limestone/Shale | No |
| Wolfcamp | -5533 | 8663 | Sandstone/Limestone/Shale | Yes |
| #REF! | #REF! | #REF! | Sandstone/Limestone/Shale | #REF! |
| #REF! | #REF! | #REF! | Sandstone/Limestone/Shale | #REF! |
| #REF! | #REF! | #REF! | Shale | #REF! |

**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 will meet all requirements for above listed system per 43 CFR 3172. 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 of the components installed will be functional, tested, and will meet all requirements per 43 CFR 3172. The wellhead will be a multibowl speed head allowing for hangoff of intermediate casing of the surface x intermedicate annulus without breaking the connection between the BOP & wellhead. A variance is requested to utilize a flexible choke line (flexhose) from the BOP to choke manifold.

**Requesting Variance?** YES
**Variance request: Multibowl Wellhead, Flexhose, Breaktesting, Offline Cementing Variances. Attachments in Section 8.**
**Testing Procedure:** Operator requests to ONLY test broken pressure seals per API Standard 53 and the attachments in Section 8. 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 21-day intervals. Testing of the ram type preventer(s) and annual type preventer(s) shall be tested per 43 CFR 3172. The BOPE configuration, choke manifold layout, and accumulator system will be in compliance with 43 CFR 3172. Bleed lines will discharge 100' from wellhead in non-H2S scenarios and 150' from wellhead in H2S scenarios.

**DV Tool Contingency Plan Request**

Anticipated DVT Placement: ~1450' Cement Details – Cement volumes will be adjusted accordingly based on DVT Placement. Planned TOC: Surface. Stage 1 (Intermediate Shoe to DVT) Lead: 100sx (54.3bbls) Cl C, 11ppg, 3.05 cf/sx cmt (120% excess) Additives: 100% ProLiteCH+5PPS Plexcredit

STE+2%SMS+0.1% R-1300+0.25% MagBond+3PPS Gilsonite+0.005GPS TOC: 1450' (DVT) Tail: 255sx (62.2bbl) Cl C, 14.8ppg, 1.37cf/sx cmt (30% excess) Additives: +5% Salt+0.25% MagBond+0.005GPS TOC: 1500' Stage 2 (DVT to Surface) Lead: 270sx (5146.7bbls) Cl C, 11ppg, 3.05 cf/sx cmt (300% excess) Additives: 100% ProLiteCH+5PPS Plexcredit STE+2%SMS+0.1% R-1300+0.25% MagBond+3PPS Gilsonite+0.005GPS TOC: Surface Tail: 165sx (39.1bbl) Cl C, 14.8ppg, 1.33cf/sx cmt (40% excess) Additives: +5% Salt+0.25% MagBond+0.005GPS TOC: 1450' (DVT)

Choke Diagram Attachemnt: 5 M Choke 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 | 300 | 0 | 300 | 300 | J55 | 54.5 | BTC | 7.62 | ### | Dry | 7.81 | Dry | 7.33 |
| Intermediate | 12.25 | 9.625 | 0 | 1975 | 0 | 1975 | 1975 | J55 | 36 | BTC | 2.60 | 1.57 | Dry | 3.73 | Dry | 3.30 |
| Production | 8.75 | 5.5 | 0 | 9095 | 0 | 8776 | 9095 | P110RY | 17 | GeoConn | 1.64 | 1.71 | Dry | 2.19 | Dry | 2.19 |
| Production | 7.875 | 5.5 | 9095 | 18933 | 8776 | 8776 | 9838 | P110RY | 17 | GeoConn | 1.64 | 1.71 | Dry | 2.19 | Dry | 2.19 |
| | | | | | | | | 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 | Quanity (sx) | Yield | Density | Cu Ft | Excess % | Cement Type | Additives |
|---|---|---|---|---|---|---|---|---|---|---|
| Surface | Tail | 0 | 300 | 240 | 1.34 | 14.8 | 320 | 50% | Class C | Accelerator |
| Intermediate | Lead | 0 | 1580 | 350 | 2.08 | 12.7 | 720 | 50% | Class C | Salt, Extender, and LCM |
| Intermediate | Tail | 1580 | 1975 | 150 | 1.34 | 14.8 | 190 | 50% | Class C | Accelerator |
| Production | Lead | 1475 | 8345 | 700 | 3.45 | 10.7 | 2390 | 40% | Class H | POZ, Extender, Fluid Loss, Dispersant, Retarder |
| Production | Tail | 8345 | 18933 | 1370 | 1.73 | 12.5 | 2370 | 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 oter 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 mud check practices.

**Cuttings Volume: 8180 Cu Ft**

**Circulating Medium Table**

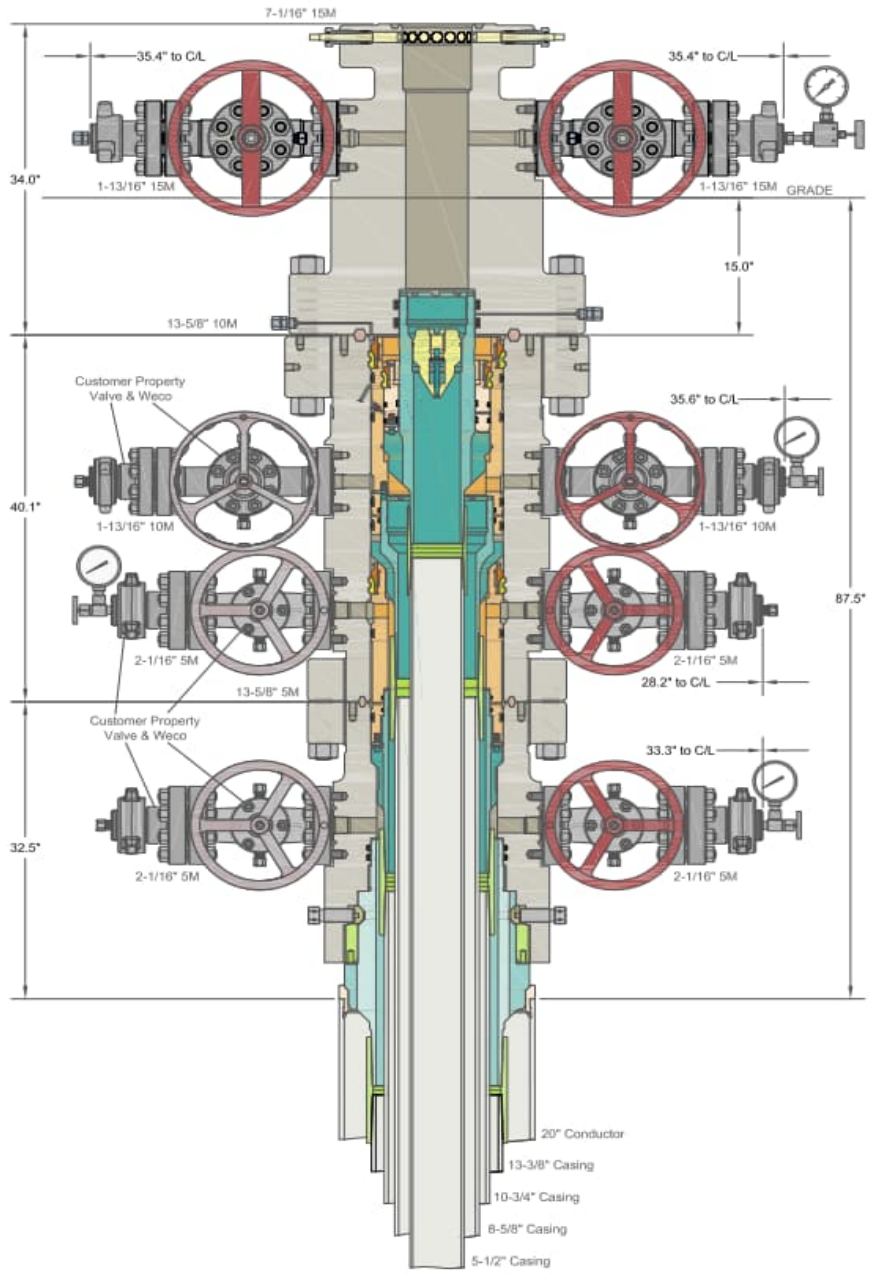
| Top Depth | Bottom Depth | Mud Type | Min Weight | Max Weight |
|---|---|---|---|---|
| 0 | 300 | Spud Mud | 8.6 | 9.5 |
| 300 | 1975 | Salt Saturated | 10 | 10 |
| 1975 | 19038 | Oil Based Mud | 9 | 10 |

## 6. Test, Logging, Coring

**List of production tests including testing procedures, equipment and safety measures:**
Will utilize MWD/LWD from intermediate hole to TD of the well.
**List of open and cased hole logs run in the well:**
DIRECTIONAL SURVEY
**Coring operation description for the well:**

## 7. Pressure

| | | |
|---|---|---|
| Anticipated Bottom Hole Pressure | 4570 | psi |
| Anticipated Surface Pressure | 2632.8 | psi |
| Anticipated Bottom Hole Temperature | 144 | °F |
| Anticipated Abnormal pressure, temp, or geo hazards | No | |





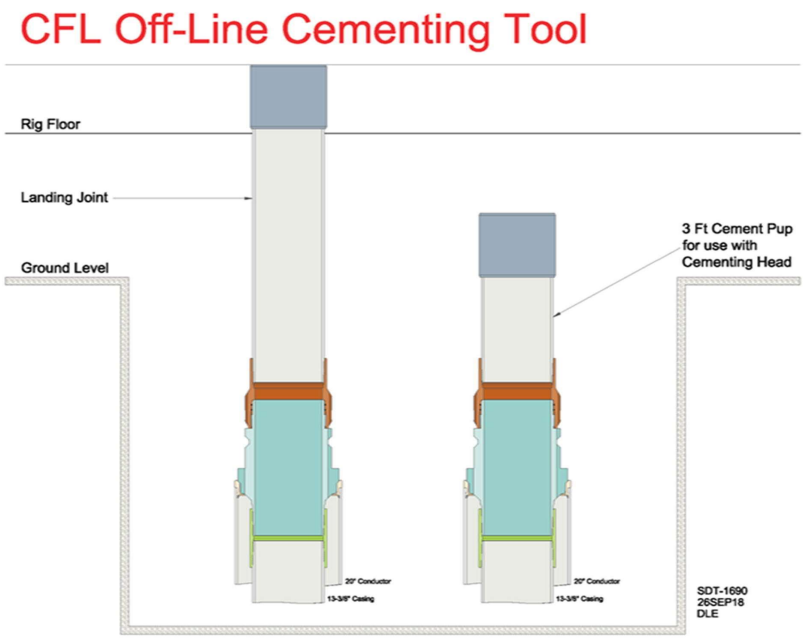

ALL DIMENSIONS APPROXIMATE

| CACTUS WELLHEAD LLC | PERMIAN RESOURCES NEW MEXICO | | |
|---|---|---|---|
| 20" x 13-3/8" x 10-3/4" x 8-5/8" x 5-1/2" MBU-4T-CFL-R-DBLO Sys.<br>With 13-5/8" 10M x 7-1/16" 15M CTH-DBLHPS Tubing Head<br>And 10-3/4" & 7-5/8" & 5-1/2" Fluted Mandrel Casing Hangers | DRAWN | DLE | 26OCT23 |
| | APPRV | | |
| | DRAWING NO. | HBE0001038 | |

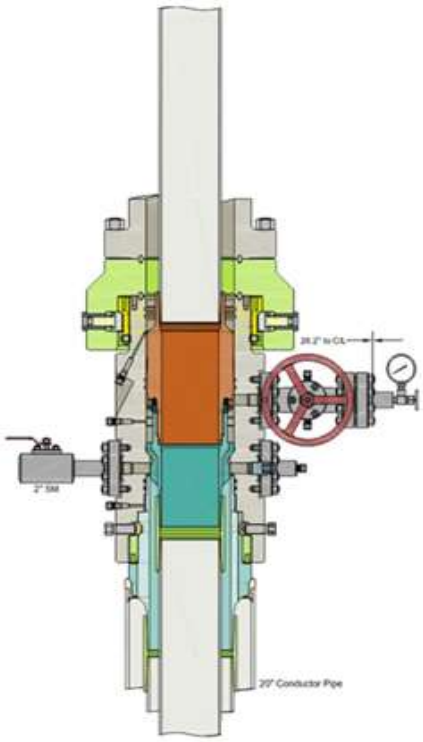
**Permian Resources Offline Cementing Procedure**
**Surface & Intermediate Casing**

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.

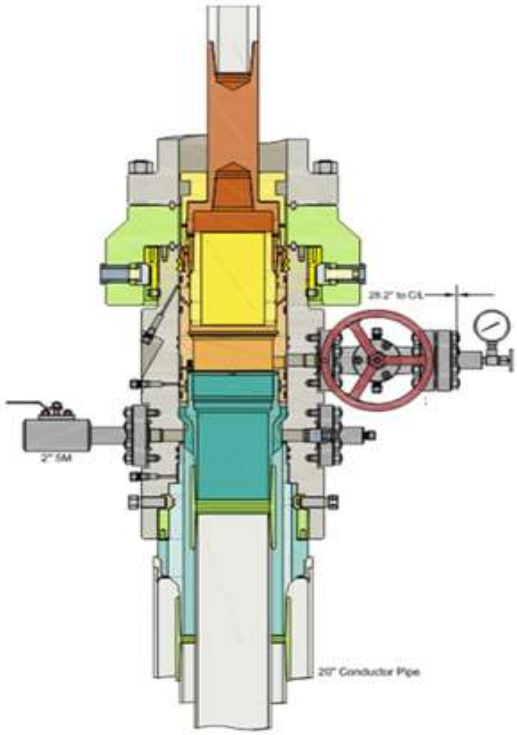
13 3/8" Surface



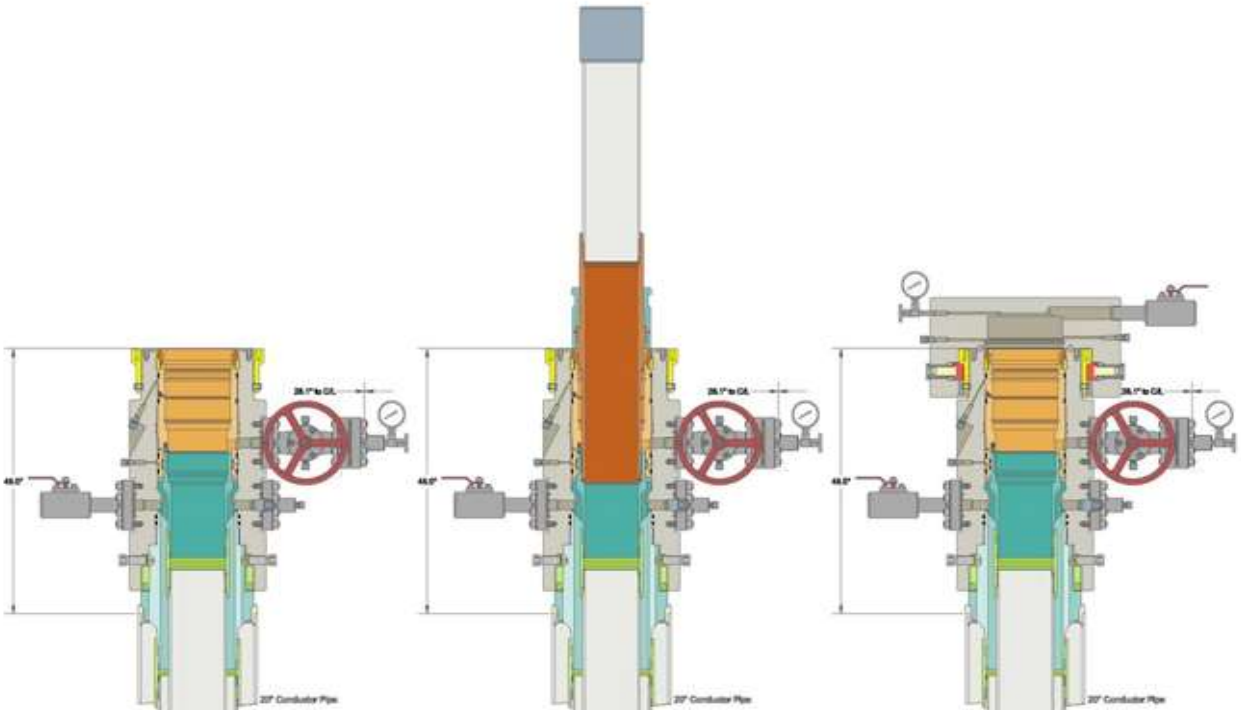
Intermediate



Run 7 5/8" Casing
Land Casing on 7 5/8" Mandrel Hanger
Cement 7 5/8" Casing
Retrieve Running Tool



Run 9 5/8" Packoff
Test Upper and Lower Seals
Engage Lockring
Retrieve Running Tool





Continental

ContiTech Fluid Technology

ContiTech Oil & Marine Corp. # 11535 Brittmoore Park Dr., Houston, TX 77041-6916 USA

CONSIGNEE / Ship-to address:

HELMERICH & PAYNE INT'L DRILLING CO
ATTN: FLEX RIG WHSE - B-BAY
210 MAGNOLIA DRIVE
GALENA PARK TX 77547

Buyer:

HELMERICH & PAYNE INT'L DRILLING CO
1437 SOUTH BOULDER
74119 TULSA

Conditions

Incoterms EXW Houston
Ex Works

**Packing list / Delivery note**

| | |
|---|---|
| Document No. | **71461553** |
| Document Date | 28.01.2022 |
| Customer Number | 11697 |
| Customer VAT No. | |
| Supplier Number | |
| Purchase Order No. | 740362040 |
| Purchase Order Date | 18.01.2022 |
| Sales Order Number | 1388153 |
| Sales Order Date | 18.01.2022 |
| Unloading Point | |
| RAN-No. | |

**Page 1 of 2**

| Weights (Gross / Net) | |
|---|---|
| Total Gross Weight | 2,507.000 LB |
| Total Net Weight | 2,507.000 LB |

| Item | Material/Description | Quantity | Net Weight | Gross Weight |
|---|---|---|---|---|
| | *Buyer: Jack Peebles*<br>*E-mail: Jackie.Peebles@hpinc.com*<br>*Tel: 832-782-6000*<br><br>*Rig/Whse: HOW* | | | |
| 20 | 00RECERTIFY<br>Recert of HP Hoses Serial# 67094<br>Commodity Code:<br>3" X 35 FT 10K Choke & Kill Hoses API 16C<br><br>End 1: 4 - 1/16" 10Kpsi API Spec 6A Type 6BX Flange<br>End 2: 4 - 1/16" 10Kpsi API Spec 6A Type 6BX Flange c/w BX155 ring groove each end<br>Standard: API Spec 16C - Monogrammed<br><br>Working Pressure: 10,000psi<br>Test Pressure: 15,000psi<br><br>Inspection & Certification includes:<br>External inspection of the hose & couplings<br>Internal boroscopic inspection of hose liner<br>Hydrostatic pressure test of hose assembly<br>Repair of any external damage to hose body and end connections (limited to minor repairs).<br>Clean & protect end connections Inspection Report<br>Disposal of hose assembly if hose fails inspection and recertification process.<br>Please Flush Hoses before sending them to our Facility. | 1 PC | 2,507.000 LB | 2,507.000 LB |

8800240
Y106-01-01
2-9-22

ContiTech Rubber Industrial Kft.
H-6728 Szeged Budapesti út 10.
P. O. Box 152 Szeged H-6701
Phone:(62)566-700, Fax:(62)566-713
Tax Number: 11087209-2-06
EU Community VAT: HU11087209
Registration No.: Cg. 0609-002502
Registry Court: Csongrád Megyei Cégbíróság

COMMERZBANK ZRT. (HUF)
H-1054 Budapest, Széchenyi rakpart 8.
H-1245 Budapest P.O. Box 1070
Account No.:14220108-26830003
IBAN: HU83 1422 0108 2683 0003 0000 0000
SWIFT: COBA HU HXXXX

COMMERZBANK AG Hannover (EUR)
30159 Hannover, Theaterstr. 11-12.
Account No.: 3 066 156 00
Sort Code: 250 400 66
BIC: COBADEFF250
IBAN: DE41250400660306615600

**Record Rotary Hose sleeve number on the CBC Made Hose List ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! ! !**

# Hydrostatic Test Certificate

ContiTech

| Certificate Number | COM Order Reference | Customer Name & Address |
|---|---|---|
| H100122 | 1388153 | HELMERICH & PAYNE DRILLING CO<br>1434 SOUTH BOULDER AVE<br>TULSA, OK 74119<br>USA |
| **Customer Purchase Order No:** | 740362040 | |
| **Project:** | | |

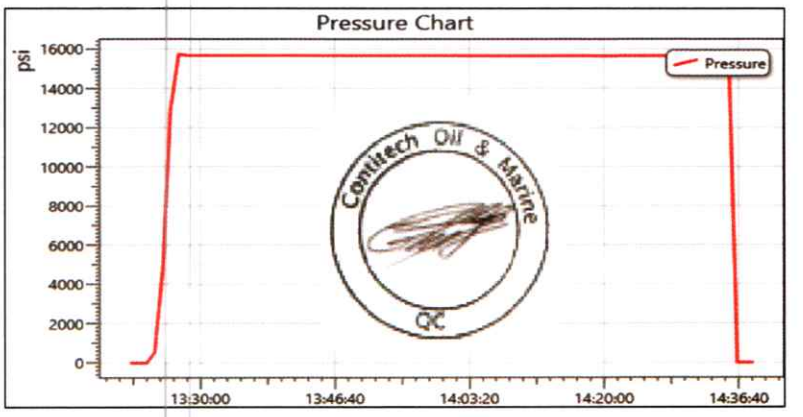
| Test Center Address | Accepted by COM Inspection | | Accepted by Client Inspection |
|---|---|---|---|
| ContiTech Oil & Marine Corp.<br>11535 Brittmoore Park Drive<br>Houston, TX 77041<br>USA | Signed:<br>Date: | Gerson Mejia-Lazo<br>02/09/22 | |

We certify that the goods detailed hereon have been inspected as described below by our Quality Management System, and to the best of our knowledge are found to conform the requirements of the above referenced purchase order as issued to ContiTech Oil & Marine Corporation.

| Item | Part No. | Description | Qnty | Serial Number | Work. Press. (psi) | Test Press. (psi) | Test Time (minutes) |
|---|---|---|---|---|---|---|---|
| 20 | RECERTIFICATION | 3" ID 10K Choke and Kill Hose x 35ft OAL | 1 | 67094 | 10,000 | 15,000 | 60 |

| Record Information | |
|---|---|
| Start Time | 1/27/2022 13:21:21 |
| End Time | 1/27/2022 14:38:28 |
| Interval | 00:01:00 |
| Number | 78 |
| MaxValue | 15849 |
| MinValue | -3 |
| AvgValue | 14240 |
| RecordName | 67094-sh |
| RecordNumber | 199 |

| Gauge Information | |
|---|---|
| Model | ADT680 |
| SN | 21817380014 |
| Range | (0-40000)psi |
| Unit | psi |



# Permian Resources
# Multi-Well Pad Batch Drilling Procedure

Surface Casing - PR intends to Batch set all surface casing to a depth approved in the APD. 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 Surface hole to Approved Depth with Rig and perform wellbore cleanup cycles. Trip out and rack back drilling BHA.
2. Run and land planned surface 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 greater - not to exceed 70% casing burst.

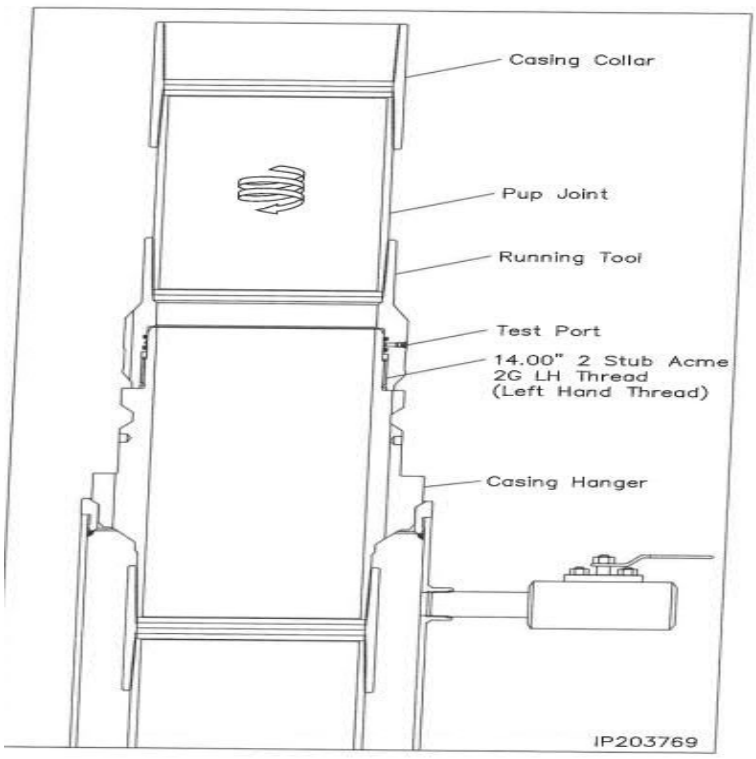



Illustration 1-1

Intermediate Casing – PR intends to Batch set all intermediate casing strings to a depth approved in the APD. Intermediate Holes will be batch drilled by the rig. Appropriate notifications will be made prior to 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 surface casing 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.
10. Install nightcap – skid rig to adjacent well to drill Intermediate hole.

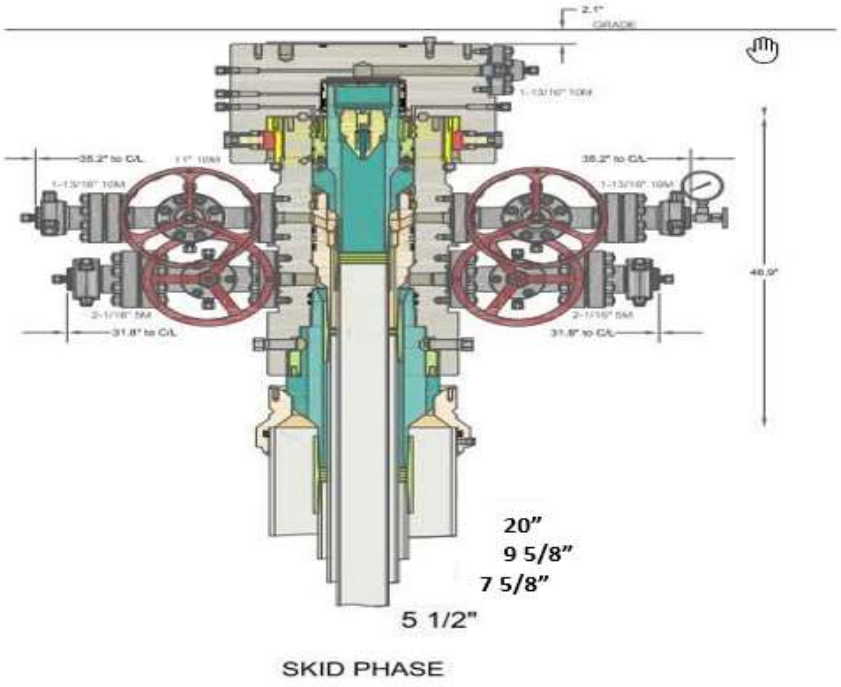



Illustration 2-2

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. Drilling 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 Production Casing.
6. Remove wear bushing then run Production casing to TD landing casing mandrel in wellhead.
7. Cement 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 Production mandrel hanger – Nipple down BOPE and install nightcap.
10. Test nightcap void to 5,000 psi for 30 minutes per illustration 2-2
11. Skid rig to adjacent well on pad to drill production hole.

# 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

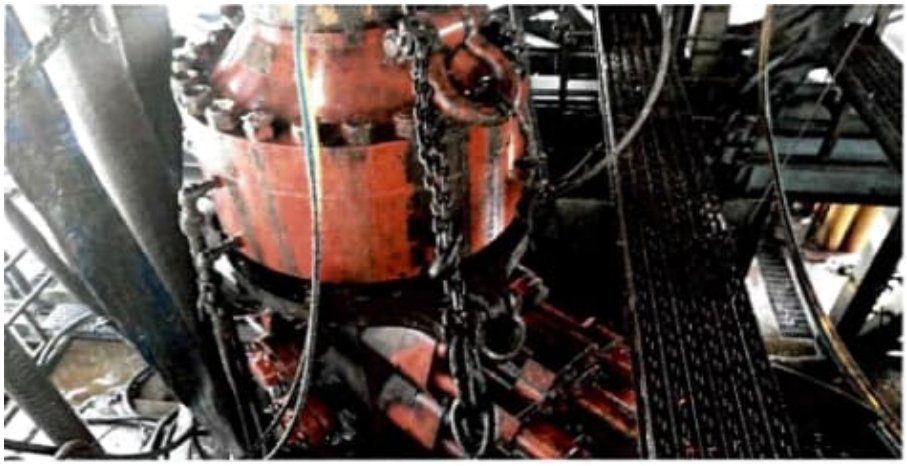


Figure 2: BOP Winch System

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[a,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[e] | 250 to 350 (1.72 to 2.41) | RWP of ram preventers or wellhead system, whichever is lower | ITP |
| Choke manifold—downstream of chokes[e] | 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.

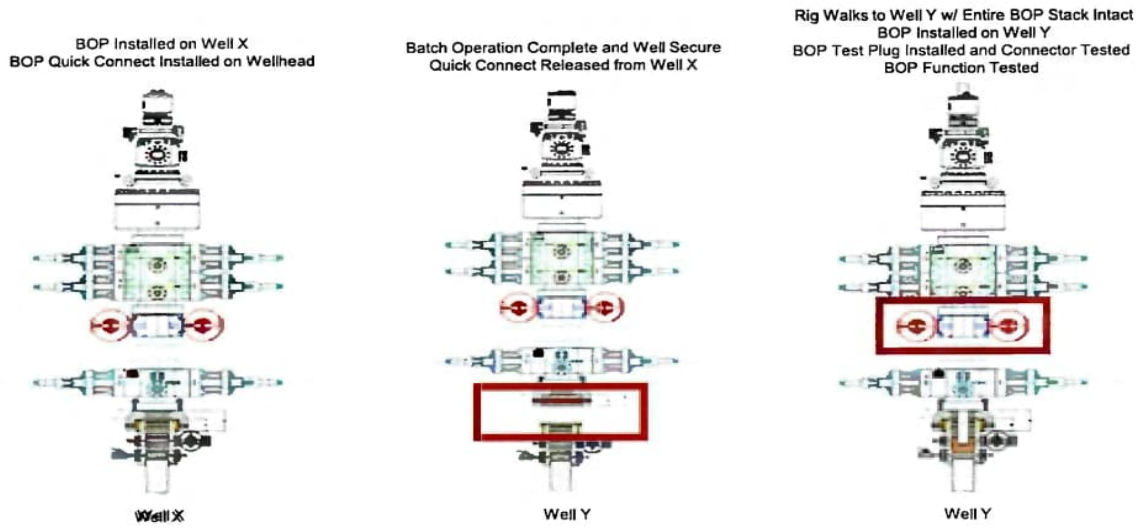
Break testing has been approved by the BLM in the past with other operators based on the detailed information provided in this document.

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.

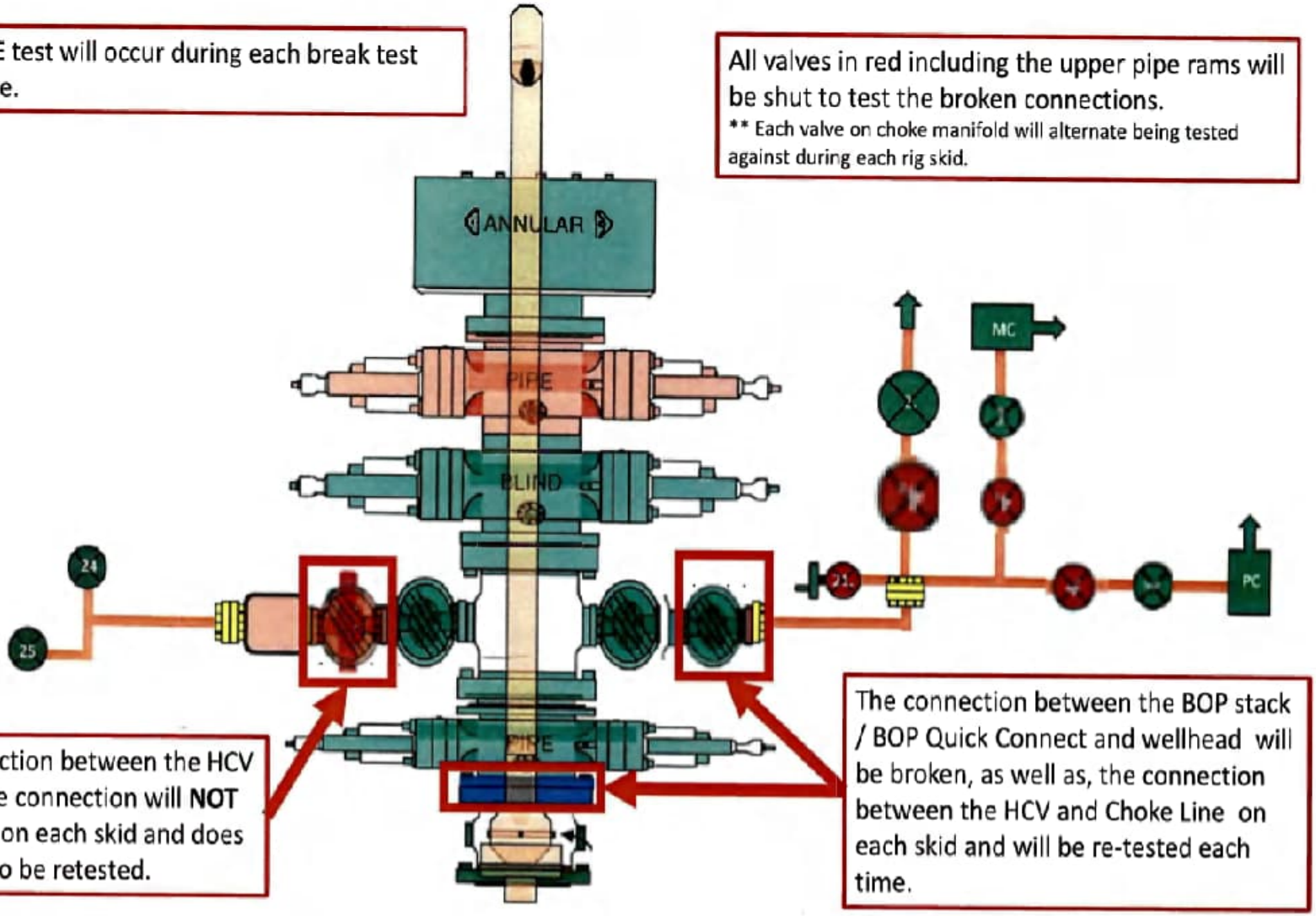
Based on public data and the supporting documentation submitted herein to the BLM, we will request permission to ONLY retest broken pressure seals if the following conditions are met:

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

# *$H_2S$ CONTINGENCY PLAN*

***FOR***

## *Permian Resources Corporation*

## *Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H*

***Eddy County, New Mexico***

**09-27-2024**
**This plan is subject to updating**

| | | |
|---|---|---|
| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |

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II. Appendix B – $SO_2$ SDS

***Section 1.0 – Introduction***

***I. Purpose***

The purpose of this contingency plan (Plan) is to provide Permian Resources Corporation. (Permian Resources) with an organized plan of action for alerting and protecting Permian Resources employees, the general public, and any potential first responders prior to any intentional release or immediately following the accidental / unintentional release of a potentially hazardous volume / concentration of Hydrogen Sulfide Gas (H2S).

***II. Scope & Applicability***

This Plan applies to all planned, unplanned, uncontrolled and/or unauthorized releases of hazardous concentrations of $H_2S$ or any associated hazardous byproducts of combustion, occurring at any Permian Resources owned or operated facilities including but not limited to: wells, flowlines, pipelines, tank batteries, production facilities, SWD facilities, compressor stations, gas processing plants, drilling / completions / workover operations, and any other applicable company owned property.

***Section 2.0 - Plan Implementation***

**I. Activation Requirements**

In accordance with the requirements of Bureau of Land Management Onshore Order #6 and NMAC 19.15.11, this Plan shall be activated in advance of any authorized, planned, unplanned, uncontrolled, or unauthorized release of a hazardous volume / concentration of $H_2S$ gas, or $SO^2$, which could potentially adversely impact the workers, general public or the environment.

**II. Emergency Evacuation**

In the event of an unplanned, uncontrolled, or unauthorized release of a hazardous volume / concentration of $H_2S$ gas, the first priority is to ensure the safety of the workers and general public. Upon discovery and subsequent determination of an applicable release, which cannot be quickly mitigated, immediately by using 911, notify local authorities to begin the process of alerting the general public, evacuate any residents within the Radius of Exposure (ROE), and limit any general public or employee access to any areas within the ROE of the affected facility.

**III. Emergency Response Activities**

The purpose of emergency response actions is to take steps to quickly mitigate / stop the ongoing release of the hazardous source of $H_2S$. Upon discovery of any hazardous release, immediately notify Permian Resources management to activate the Emergency Response Team (ERT). Once Permian Resources supervision arrives and assesses the situation, a work plan identifying the proper procedures shall be developed to stop the release.

***Section 3.0 - Potential Hazardous Conditions & Response Actions***

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
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During a planned or unplanned release of $H_2S$, there are several hazardous conditions that are presented both to employees, the general public, and emergency responders. These specific hazardous conditions are identified in the tables below.

| H2S OPERATING CONDITIONS – RESPONSE ACTIONS TO CONSIDER | ✓ |
|---|---|
| **$H_2S$ CONDITION 1: POTENTIAL DANGER TO LIFE AND HEALTH –> WARNING SIGN GREEN** | |
| **$H_2S$ concentration <10 ppm** detected by location monitors | ❑ |
| **General Actions During Condition 1** | ❑ |
| Notify Site Supervisor / Permian Resources Person-in-Charge (PIC) of any observed increase in ambient $H_2S$ concentrations | ❑ |
| All personnel check safety equipment is in adequate working order & store in accessible location | ❑ |
| Sensitize crews with safety meetings. | ❑ |
| Limit visitors and non-essential personnel on location | ❑ |
| Continuously monitor $H_2S$ concentrations and check calibration of sensors | ❑ |
| Ensure $H_2S$ scavenger is on location. | ❑ |
| **$H_2S$ CONDITION 2: MODERATE DANGER TO LIFE AND HEALTH → WARNING SIGN YELLOW** | |
| **$H_2S$ concentration >10 ppm and < 30 ppm** in atmosphere detected by location monitors: | ❑ |
| **General Actions During Condition 2** | ❑ |
| Sound $H_2S$ alarm and/or display yellow flag. | ❑ |
| Account for on-site personnel | ❑ |
| Upon sounding of an area or personal $H_2S$ monitor alarm when 10 ppm is reached, proceed to a safe briefing area upwind of the location immediately (see **MA-4**, **Figure 5-1**). | ❑ |
| Don proper respiratory protection. | ❑ |
| Alert other affected personnel | ❑ |
| **If trained and safe to do so** undertake measures to control source H2S discharge and eliminate possible ignition sources. Initiate Emergency Shutdown procedures as deemed necessary to correct or control the specific situation. | ❑ |
| Account for on-site personnel at safe briefing area. | ❑ |
| Stay in safe briefing area if not working to correct the situation. | ❑ |
| Keep Site Supervisor / Permian Resources PIC informed.<br>Notify applicable government agencies **(Appendix A)**<br>If off-site impact; notify any neighbors within Radius of Exposure **(ROE)**, **Fig 5.11** | ❑ |
| Continuously monitor $H_2S$ until readings below 10 ppm. | ❑ |
| Evacuated area shall not be re-entered except by trained and authorized personnel utilizing appropriate respiratory protection; or until "all clear" sounded by Permian Resources PIC / Site Supervisor. | |
| | |

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
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| | |
| **$H_2S$ CONDITION 3: EXTREME DANGER TO LIFE AND HEALTH → WARNING SIGN RED** | |
| > **30 ppm $H_2S$** concentration in air detected by location monitors: Extreme danger to life | ❑ |
| **General Actions During Condition 3** | ❑ |
| Sound $H_2S$ alarm and/or display red flag. | ❑ |
| Account for on-site personnel | ❑ |
| Move away from $H_2S$ source and get out of the affected area. | ❑ |
| Proceed to designated safe briefing area; alert other affected personnel. | ❑ |
| Account for personnel at safe briefing area. | ❑ |
| If trained and safe to do so undertake measures to control source H2S discharge and eliminate possible ignition sources. Initiate Emergency Shutdown procedures as deemed necessary to correct or control the specific situation. | ❑ |
| Notify vehicles or situation and divert all traffic away from location. | ❑ |
| Permian Resources Peron-in-Charge will make appropriate community notifications. | ❑ |
| Red warning flag must be on display until the situation has been corrected and the Permian Resources Person-in-Charge determines it is safe to resume operations under **Condition 1**. | ❑ |
| Notify management of the condition and action taken. If $H_2S$ concentration is increasing and steps to correct the situation are not successful – or at any time if well control is questionable – alert all responsible parties for possible activation of the $H_2S$ Contingency Plan. If well control at the surface is lost, determine if situation warrants igniting the well. | ❑ |
| If uncontrolled flow at the surface occurs, the Permian Resources PIC, with approval, if possible, from those coordinating the emergency **(as specified in the site-specific $H_2S$ Contingency Plan)** are responsible for determining if the situation warrants igniting the flow of the uncontrolled well. This decision should be made only as a last resort and in a situation where it is obvious that human life is in danger and there is no hope of controlling the flow under prevailing conditions. | ❑ |
| If the flow is ignited, burning $H_2S$ will be converted to sulfur dioxide ($SO_2$), which is also highly toxic. Do not assume that area is safe after the flow is ignited. If the well is ignited, evacuation of the area is mandatory, because $SO_2$ will remain in low-lying places under no-wind conditions. | ❑ |
| Keep Site Supervisor / Permian Resources PIC informed.<br>Notify applicable government agencies and local law enforcement **(Appendix A)**<br>If off-site impact; notify any neighbors within the Radius of Exposure **(ROE)**, see example in **Figure 5-11.** | ❑ |
| Continuously monitor $H_2S$ until readings fall below 10 ppm. | ❑ |

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
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| | |
|---|---|
| Evacuated area shall not be re-entered except by trained and authorized personnel utilizing appropriate respiratory protection; or until "all clear" sounded by Permian Resources PIC / Site Supervisor. | ❑ |
| **IF ABOVE ACTIONS CANNOT BE ACCOMPLISHED IN TIME TO PREVENT EXPOSURE TO THE PUBLIC** | |
| Alert public (directly or through appropriate government agencies) who may be subject to potentially harmful exposure levels. | ❑ |
| Make recommendations to public officials regarding blocking unauthorized access to the unsafe area and assist as appropriate. | ❑ |
| Make recommendations to public officials regarding evacuating the public and assist as appropriate. | ❑ |
| Monitor ambient air in the area of exposure (after following abatement measures) to determine when it is safe for re-entry. | ❑ |

***Section 4.0 - Notification of $H_2S$ Release Event***

**I. Local & State Law Enforcement**

Prior to the planned / controlled release of a hazardous concentration of $H_2S$ gas or any associated byproducts of the combustion of $H_2S$ gas, notify local law enforcement agencies regarding the contents of this plan.

In the event of the discovery of an unplanned/uncontrolled release of a hazardous concentration of $H_2S$ gas or any associated byproducts of combustion, immediately notify local and/or state law enforcement agencies of the situation and ask for their assistance.

**II. General Public**

In the event of a planned or unplanned release of a hazardous concentration of $H_2S$ gas or any associated byproducts of combustion, notify local law enforcement agencies and ask for their assistance in alerting the general public and limiting access to any public roads that may be impacted by such a release.

**III. New Mexico Oil Conservation Division**

The Permian Resources HSE Department will make any applicable notification to the New Mexico OCD regarding any release of a hazardous concentration of $H_2S$ Gas or any associated byproducts of combustion.

**IV. New Mexico Environment Department**

The Permian Resources HSE Department will make any applicable notifications to the NMED regarding any release of a hazardous concentration of $H_2S$ gas or any associated byproducts of combustion.

V. **Bureau of Land Management**

The Permian Resources Regulatory Department will make any applicable notifications to the BLM

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

regarding any release of a hazardous concentration of $H_2S$ gas or any associated byproducts of combustion.

***Section 5.0 - Emergency Contact List***

| EMERGENCY CONTACT LIST | | | | |
|---|---|---|---|---|
| PERMIAN RESOURCES CORPORATION. | | | | |
| **POSITION** | **NAME** | **OFFICE** | **CELL** | **ALT PHONE** |
| **Operations** | | | | |
| Operations Superintendent | Rick Lawson | | 432.530.3188 | |
| TX Operations Superintendent | Josh Graham | 432.940.3191 | 432.940.3191 | |
| NM Operations Superintendent | Manual Mata | 432.664.0278 | 575.408.0216 | |
| Drilling Manager | Jason Fitzgerald | 432.315.0146 | 318.347.3916 | |
| Drilling Engineer | Parker Simmons | 432.400.1038 | 281.536.9813 | |
| Production Manager | Levi Harris | 432.219.8568 | 720.261.4633 | |
| SVP Development Ops | Clayton Smith | 720.499.1416 | 361.215.2494 | |
| SVP Production Ops | Casey McCain | 432.695.4239 | 432.664.6140 | |
| **HSE & Regulatory** | | | | |
| H&S Manager | Adam Hicks | 720.499.2377 | 903.426.4556 | |
| Regulatory Manager | Stephanie Rabadue | | 432.260.4388 | |
| Environmental Manager | Montgomery Floyd | 432-315-0123 | 432-425-8321 | |
| | | | | |
| HSE Consultant | Blake Wisdom | | 918-323-2343 | |
| **Local, State, & Federal Agencies** | | | | |
| Eddy County Sheriff | | 575-887-7551 | | 911 |
| New Mexico State Highway Patrol | | 505-757-2297 | | 911 |
| Carlsbad Fire / EMS | | 575-885-3125 | | 911 |
| Carlsbad Memorial Hospital | | 575-887-4100 | | |
| Secorp – Safety Contractor | Ricky Stephens | | (325)-262-0707 | |
| New Mexico Oil Conservation Division – District 1 Office – Hobbs, NM. | | 575-393-6161 | | |
| New Mexico Environment Department – District III Office – Hobbs, NM | | 575-397-6910 | | |
| New Mexico Oil Conservation Division – Hobbs, NM | 24 Hour Emergency | 575-393-6161 | | |
| Bureau of Land Management – Carlsbad, NM | | 575-706-2779 | | |
| Eddy County PET Inspector | | 575-361-2822 | | |
| U.S. Fish & Wildlife | | 502-248-6911 | | |

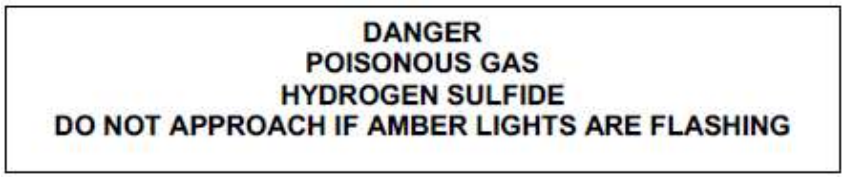
| | | |
|---|---|---|
| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |

***Section 6.0 – Drilling Location Information***

***I. Site Safety Information***

1. Safe Briefing Area
   a. There shall be two areas that will be designated as "SAFE BRIEFING AREAs". If $H_2S$ is detected in concentrations equal to or in excess of 10 ppm all personnel not assigned emergency duties are to assemble in the designated Safe Briefing area for instructions. These two areas shall be positioned in accessible locations to facilitate the availability of self-contained breathing air devices. The briefing areas shall be positioned no less than 250' from the wellhead and in such locations that at least one briefing area will be up-wind from the well at all times.

2. Wind Indicators
   a. 4 Windsocks will be installed at strategic points on the facility.
3. Danger Signs
   a. A warning sign indicating the possible well conditions will be displayed at the location entrance.




4. $H_2S$ Detectors and Alarms
   a. Continuous monitoring type $H_2S$ detectors, capable of sensing a minimum of 5ppm $H_2S$ in air will be located centrally located at the tanks, heater treater, and combustor. Continuous monitoring type $SO_2$ detector will also be located at the combustor. The automatic $H_2S$ alarm/flashing light will be located at the site entrance and in front of tank battery.

5. Safety Trailer
   a. A safety trailer equipped with an emergency cascade breathing air system with 2 ea. Work/escape packs, a stretcher, 2 OSHA approved full body harnesses, and a 20# Class ABC fire extinguisher shall be available at the site in close proximity to the safe briefing area. The cascade system shall be able to be deployed to the drill floor when needed to provide safe breathing air to the workers as needed.

6. Well Control Equipment
   a. The location shall have a flare line to a remote automatic ignitor and back up flare gun, placed 150' from the wellhead.
   b. The location shall be equipped with a remotely operated choke system and a mud gas separator.

7. Mud Program
   a. Company shall have a mud program that contains sufficient weight and additives to control $H_2S$.

| | | |
|---|---|---|
| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |

8. Metallurgy
    a. All drill strings, casing, tubing, wellhead, BOP, spools, kill lines, choke manifold and lines, and valves shall be suitable for anticipated $H_2S$ volume and pressure.

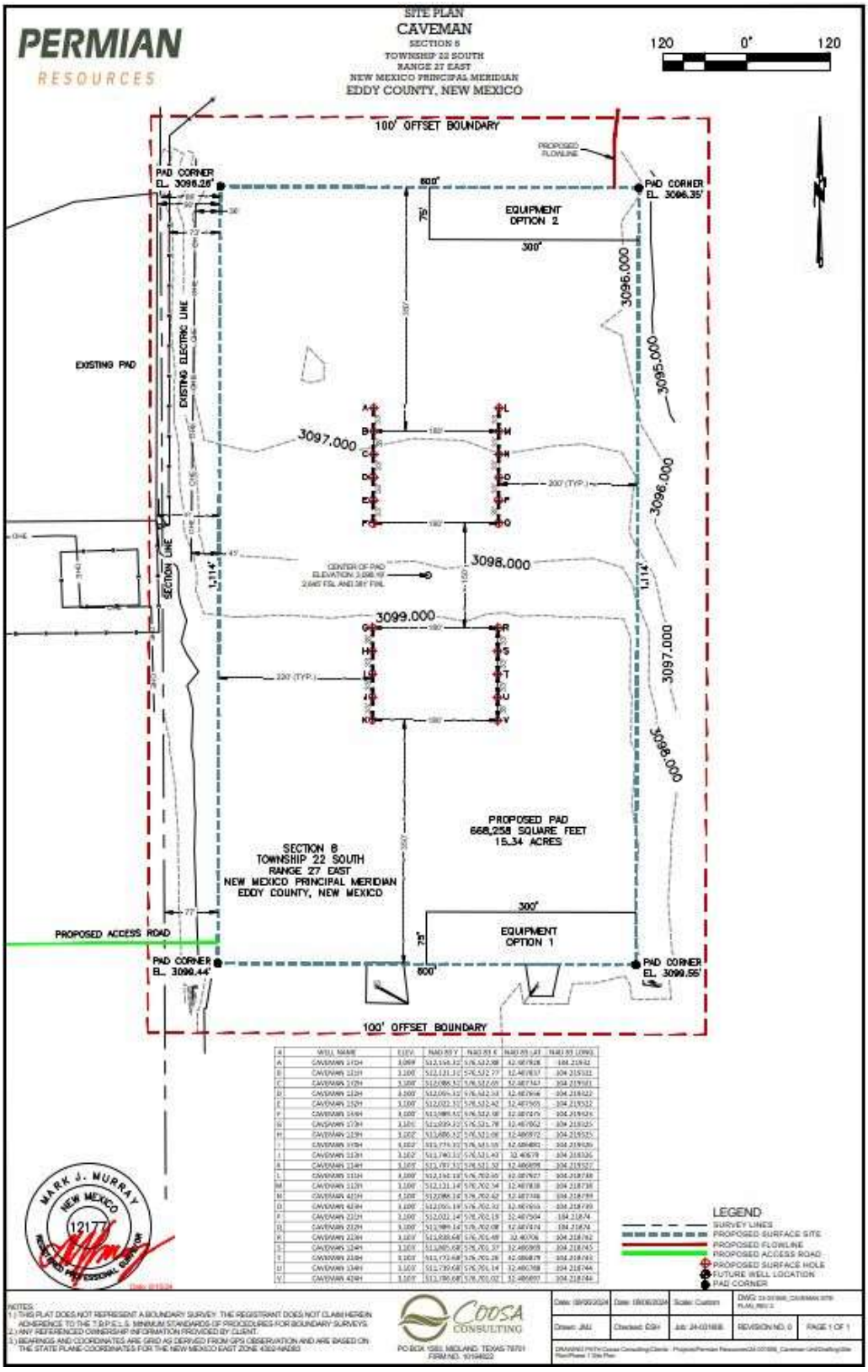
9. Communication
    a. The location shall be equipped with a means of effective communication such as a cell phones, intercoms, satellite phones or landlines.

### *II. Directions to Location*

BEGINNING AT THE INTERSECTION OF U.S. HIGHWAY 62 AND GREENE ST IN CARLSBAD, PROCEED SOUTH ON CANAL ST FOR 1.1 MILES THEN TURN LEFT ONTO E FIESTA DR. TRAVEL 0.2 MILES AND TURN LEFT ON PAVED ROAD. TRAVEL 0.3 MILES TO LOCATION AND TURN RIGHT. PROCEED TO LOCATION.

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

Plat of Location



| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

1. Routes of Ingress & Egress (MAP)

2. Residences in proximity to the 3000’ Radius of Exposure (ROE) (MAP)

There are no residences or public gathering places with the 100 PPM, 300 PPM, or 500 PPM ROE.

| | | |
|---|---|---|
| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |

***Map of 3000' ROE Perimeter***

***100 PPM, 300 PPM, & 500 PPM Max ROE under worst case scenario***

| | | |
|---|---|---|
| **Enter $H_2S$ in PPM** | 1500 | |
| **Enter Gas flow in mcf/day (maximum worst case conditions)** | 2500 | |
| **500** ppm radius of exposure (public road) | **105** | feet |
| **300** ppm radius of exposure | **146** | feet |
| **100** ppm radius of exposure (public area) | **230** | feet |

- Location NAD 83 GPS Coordinates ***Lat: 32.407655, Long: -104.218739***

***3.*** Public Roads in proximity of the Radius of Exposure (ROE)

There are no public roads that would be within the 500 PPM ROE. The closest public road is Industrial Avenue which is 900' from the location.

| | | |
|---|---|---|
| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |

***Section 7.0 – Hazard Communication***

***I. Physical Characteristics of Hydrogen Sulfide Gas***

Hydrogen sulfide ($H_2S$) is a colorless, poisonous gas that is soluble in water. It can be present in crude oils, condensates, natural gas and wastewater streams.

$H_2S$ is heavier than air with a vapor density of 1.189 (air = 1.0); however, $H_2S$ is most often mixed with other gases. These mixtures of $H_2S$ and other gases can be heavier or lighter than air. If the $H_2S$-containing mixture is heavier, it can collect in low areas such as ditches, ravines, firewalls, and pits; in storage tanks; and in areas of poor ventilation. Please see physical properties in **Table 7.0.**

With $H_2S$ the sense of smell is rapidly lost allowing lethal concentrations to be accumulated without warning. The toxicity of hydrogen sulfide at varying concentrations is indicated in the **Table 7.1.**

**Warning:** Do not use the mouth-to-mouth method if a victim ingested or inhaled hydrogen sulfide. Give artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device.

**Table 7.0. Physical Properties of $H_2S$**

| Properties of H2S | Description |
|---|---|
| Vapor Density > 1 = 1.189<br>Air = 1 | ▪ H2S gas is slightly heavier than air, which can cause it to settle in low places and build in concentration.<br>▪ Produced as a mixture with other gases associated with oil and gas production. |
| Flammable Range 4.3%-46%<br>43000 ppm – 460000 ppm | ▪ H2S can be extremely flammable / explosive when these concentrations are reached by volume in air. |

Although $H_2S$ is primarily a respiratory hazard, it is also flammable and forms an explosive mixture at concentrations of 4.3%–46.0% (40,000ppm – 460,000 ppm) by volume in air.

**$H_2S$ can be encountered when:**

- Venting and draining equipment.
- Opening equipment (separators, pumps, and tanks).
- Opening piping connections (“line breaking”).
- Gauging and sampling storage tanks.
- Entering confined spaces.
- Working around wastewater pits, skimmers, and treatment facilities.

II. Human Health Hazards - Toxicological Information

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

**Table 7.1. Hazards & Toxicity**

| Concentration (ppm) | Symptoms/Effects |
|---|---|
| 0.00011-0.00033 ppm | Typical background concentrations |
| 0.01-1.5 ppm | Odor threshold (when rotten egg smell is first noticeable to some). Odor becomes more offensive at 3-5 ppm. Above 30 ppm, odor described as sweet or sickeningly sweet. |
| 2-5 ppm | Prolonged exposure may cause nausea, tearing of the eyes, headaches or loss of sleep. Airway problems (bronchial constriction) in some asthma patients. |
| 20 ppm | Possible fatigue, loss of appetite, headache, irritability, poor memory, dizziness. |
| 50-100 ppm | Slight conjunctivitis ("gas eye") and respiratory tract irritation after 1 hour. May cause digestive upset and loss of appetite. |
| 100 ppm | Coughing, eye irritation, loss of smell after 2-15 minutes (olfactory fatigue). Altered breathing, drowsiness after 15-30 minutes. Throat irritation after 1 hour. Gradual increase in severity of symptoms over several hours. Death may occur after 48 hours. |
| 100-150 ppm | Loss of smell (olfactory fatigue or paralysis). |
| 200-300 ppm | Marked conjunctivitis and respiratory tract irritation after 1 hour. Pulmonary edema may occur from prolonged exposure. |
| 500-700 ppm | Staggering, collapse in 5 minutes. Serious damage to the eyes in 30 minutes. Death after 30-60 minutes. |
| 700-1000 ppm | Rapid unconsciousness, "knockdown" or immediate collapse within 1 to 2 breaths, breathing stops, death within minutes. |
| 1000-2000 ppm | Nearly instant death |

III. Environmental Hazards

$H_2S$ and its associated byproducts from combustion presents a serious environmental hazard. Sulphur

| | | |
|---|---|---|
| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |

Dioxide $SO_2$ is produced as a constituent of flaring $H_2S$ Gas and can present hazards associated, which are similar to $H_2S$. Although $SO_2$ is heavier than air, it will be picked up by a breeze and carried downwind at elevated temperatures. Since Sulfur Dioxide is extremely irritating to the eyes and mucous membranes of the upper respiratory tract, it has exceptionally good warning powers in this respect. The following table indicates the toxic nature of the gas. Please see the attached SDS in Appendix B for reference.

| SULFUR DIOXIDE TOXICITY | | |
|---|---|---|
| Concentration | | Effects |
| $\%SO_2$ | PPM | |
| 0.0005 | 3 to 5 | Pungent odor-normally a person can detect $SO_2$ in this range. |
| 0.0012 | 12 | Throat irritation, coughing, and constriction of the chest tearing and smarting of eyes. |
| 0.15 | 150 | So irritating that it can only be endured for a few minutes. |
| 0.05 | 500 | Causes a sense of suffocation, even with first breath. |

***Section 8.0 - Regulatory Information***

I. OSHA & NIOSH Information

**II. Table 8.0. OSHA & NIOSH $H_2S$ Information**

| PEL, IDLH, TLV | Description |
|---|---|
| NIOSH PEL 10 PPM | ▪ PEL is the Permissible Exposure Limit that an employee may be exposed up to 8 hr / day. |
| OSHA General Industry Ceiling PEL – 20 PPM | ▪ The maximum exposure limit, which cannot be exceeded for any length of time. |
| IDLH 100 PPM | ▪ Immediately Dangerous to Life and Health |
| Permian Resources PEL 10 PPM | ▪ Permian Resources Policy Regarding H2S for employee safety |

III. New Mexico OCD & BLM – $H_2S$ Concentration Threshold Requirements

New Mexico NMAC 19.15.11 and Onshore Order #6 identify two Radii of Exposure (ROE) that identify potential danger to the public and require additional compliance measures. Permian Resources is required to install safety devices, establish safety procedures and develop a written $H_2S$ contingency plan for sites where the $H_2S$ concentrations are as follows.

**Table 8.1. Calculating $H_2S$ Radius of Exposure**

| $H_2S$ Radius of Exposure | Description | Control and Equipment Requirements |
|---|---|---|

| | | |
|---|---|---|
| 100 ppm | Distance from a release to where the $H_2S$ concentration in the air will dilute below 100ppm | ROE > 50-ft and includes any part of a "public area" (residence, school, business, etc., or any area that can be expected to be populated).<br>ROE > 3,000-ft |
| 500 ppm | Distance from a release to where the $H_2S$ concentration in the air will dilute below 500ppm | ROE > 50-ft and includes any part of a public road (public roads are tax supported roads or any road used for public access or use) |

**Calculating $H_2S$ Radius of Exposure**

The ROE of an $H_2S$ release is calculated to determine if a potentially hazardous volume of $H_2S$ gas at 100 or 500 parts per million (ppm) is within a regulated distance requiring further action. If information about the concentration of $H_2S$ and the potential gas release volume is known, the location of the Muster Areas will be set, and safety measures will be implemented based on the calculated radius of exposure (ROE). NMAC 19.15.11 – Hydrogen Sulfide Safety defines the ROE as the radius constructed with the gas's point of escape as its center and its length calculated by the following Pasquill-Gifford equations:

To determine the extent of the **100 ppm ROE**:

$x = [(1.589)\ (\text{mole fraction } H_2S)(Q)]^{(.6258)}$.

To determine the extent of the **500 ppm ROE**:

$x = [(0.4546)\ (\text{mole fraction } H_2S)(Q)]^{(.6258)}$.

**Table 8.2. Calculating H2S Radius of Exposure**

| ROE Variable | Description |
|---|---|
| X = | ROE in feet |
| Q = | **Max volume of gas released determined to be released in cubic feet per day ($ft^3/d$)** normalized to standard temperature and pressure, 60°F and 14.65 psia |
| *Mole fraction $H_2S$ =* | Mole fraction of $H_2S$ in the gaseous mixture released. |

The volume used as the escape rate in determining the ROE is specified in the rule as follows:

- The maximum daily volume rate of gas containing $H_2S$ handled by that system element for which the ROE is calculated.
- For existing gas wells, the current adjusted open-flow rate, or the operator's estimate of the well's capacity to flow against zero back-pressure at the wellhead.

**New Mexico Oil Conservation Division & BLM Site Requirements under NMAC 19.15.11 & Onshore Order #6**

- Two cleared areas will be designated as Safe Briefing Areas. During an emergency, personnel will assemble in one of these areas for instructions from the Permian Resources Person-in-Charge.

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

Prevailing wind direction should be considered in locating the briefing areas 200' or more on either side of the well head. One area should offset the other at an angle of 45° to 90° with respect to prevailing wind direction to allow for wind shifts during the work period.

- In the event of either an intentional or accidental releases of hydrogen sulfide, safeguards to protect the general public from the harmful effects of hydrogen sulfide must be in place for operations. A summary of the provisions in each of three $H_2S$ ROE cases is included in **Table 8.3**.
    - **CASE 1** -100 ppm ROE < 50'
    - **CASE 2** - 100 ppm ROE is 50' or greater, but < 3000' and does not penetrate public area.
    - **CASE 3** -100 ppm ROE is 50' or greater and penetrates a public area or 500 ppm ROE includes a public road. Also if 100 ppm ROE > 3000' regardless of public area.

**Table 8.3. NMAC 19.15.11 Compliance Requirements Drilling & Production**

| NMAC 19.15.11 & BLM COMPLIANCE REQUIREMENTS - DRILLING & PRODUCTION | | | |
|---|---|---|---|
| **PROVISION** | **CASE 1** | **CASE 2** | **CASE 3** |
| $H_2S$ Concentration Test | X | X | X |
| H-9 | X | X | X |
| Training | X | X | X |
| District Office Notification | X | X | X |
| Drill Stem Tests Restricted | X* | X* | X |
| BOP Test | X* | X* | X |
| Materials | | X | X |
| Warning and Marker | | X | X |
| Security | | X | X |
| Contingency Plan | | | X |
| Control and Equipment Safety | | | X |
| Monitors | | X** | X** |
| Mud (ph Control or Scavenger) | | | X* |
| Wind Indicators | | X** | X |
| Protective Breathing Equipment | | X** | X |
| Choke Manifold, Secondary Remote Control, and Mud-Gas Separator | | | X |
| Flare Stacks | | | X* |

***Section 9.0 - Training Requirements***

**Training**

The following elements are considered a minimum level of training for personnel assigned to operations who may encounter $H_2S$ as part of routine or maintenance work.

- The hazards, characteristics, and properties of hydrogen sulfide ($H_2S$) and ($SO_2$).
- Sources of $H_2S$ and $SO_2$.
- Proper use of $H_2S$ and $SO_2$ detection methods used at the workplace.
- Recognition of, and proper response to, the warning signals initiated by $H_2S$ and $SO_2$ detection systems in use at the workplace.

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

- Symptoms of $H_2S$ exposure; symptoms of $SO_2$ exposure
- Rescue techniques and first aid to victims of $H_2S$ and $SO_2$ exposure.
- Proper use and maintenance of breathing equipment for working in $H_2S$ and $SO_2$ atmospheres, as appropriate theory and hands-on practice, with demonstrated proficiency (29 *CFR* Part 1910.134).
- Workplace practices and relevant maintenance procedures that have been established to protect personnel from the hazards of $H_2S$ and $SO_2$.
- Wind direction awareness and routes of egress.
- Confined space and enclosed facility entry procedures (if applicable).
- Emergency response procedures that have been developed for the facility or operations.
- Locations and use of safety equipment.
- Locations of safe briefing areas.

***Refresher training will be conducted annually.***

***Section 10.0 - Personal Protective Equipment***

I. Personal $H_2S$ Monitors

All personnel engaged in planned or unplanned work activity to mitigate the release of a hazardous concentration of $H_2S$ shall have on their person a personal H2S monitor.

II. Fixed $H_2S$ Detection and Alarms

- 4 channel $H_2S$ monitor
- 4 wireless $H_2S$ monitors
- $H_2S$ alarm system (Audible/Red strobe)
- Personal gas monitor for each person on location
- Gas sample tubes

III. Flame Resistant Clothing

All personnel engaged in planned or unplanned work activity associated with this Plan shall have on the appropriate level of FRC clothing.

IV. Respiratory Protection

The following respiratory protection equipment shall be available at each drilling location.

- Working cascade system available on rig floor and pit system & 750' of air line hose
- Four (4) breathing air manifolds
- Four (4) 30-minute rescue packs
- Five (5) work/Escape units
- Five (5) escape units
- One (1) filler hose for the work/escape/rescue units

Supplied air (airline or SCBA) respiratory protection against hydrogen sulfide exposure is required in the following situations:

- When routine or maintenance work tasks involve exposure to $H_2S$ concentrations of 10 ppm or greater.

| | | |
|---|---|---|
| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |

- When a fixed location area monitor alarms, and re-entry to the work area is required to complete a job.
- When confined spaces are to be entered without knowledge of $H_2S$ levels present, or if initial measurements are to be taken of $H_2S$ levels.
- During rescue of employees suspected of $H_2S$ overexposure.
- For specific tasks identified with significant exposure potential and outlined in local program guidelines.
- All respiratory equipment for hydrogen sulfide must be of the supplied-air type, equipped with pressure-demand regulators and operated in the pressure-demand mode only. This is the only type of respiratory protection recommended for hydrogen sulfide application. Equipment should be approved by NIOSH/MSHA or other recognized national authority as required. If airline units are used, a five-minute egress bottle should also be carried.
- Gas masks or other air-purifying respirators MUST NEVER BE USED FOR HYDROGEN SULFIDE due to the poor warning properties of the gas.
- Use of respiratory protection should be accompanied by a written respiratory protection program.

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

Appendix A
$H_2S$ SDS

PRAXAIR

# Hydrogen sulfide

## Safety Data Sheet E-4611

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 08-10-2016 Supersedes: 10-15-2013

## SECTION 1: Identification

### 1.1. Product identifier

| | | |
|---|---|---|
| Product form | : | Substance |
| Name | : | Hydrogen sulfide |
| CAS No | : | 7783-06-4 |
| Formula | : | H2S |
| Other means of identification | : | Hydrogen sulfide |
| Product group | : | Core Products |

### 1.2. Recommended use and restrictions on use

| | | |
|---|---|---|
| Recommended uses and restrictions | : | Industrial use<br>Use as directed |

### 1.3. Supplier

Praxair Canada inc.
1200 – 1 City Centre Drive
Mississauga - Canada L5B 1M2
T 1-905-803-1600 - F 1-905-803-1682
www.praxair.ca

### 1.4. Emergency telephone number

| | | |
|---|---|---|
| Emergency number | : | 1-800-363-0042<br>Call emergency number 24 hours a day only for spills, leaks, fire, exposure, or accidents involving this product.<br>For routine information, contact your supplier or Praxair sales representative. |

## SECTION 2: Hazard identification

### 2.1. Classification of the substance or mixture

**GHS-CA classification**

| | |
|---|---|
| Flam. Gas 1 | H220 |
| Liquefied gas | H280 |
| Acute Tox. 2 (Inhalation: gas) | H330 |
| STOT SE 3 | H335 |

### 2.2. GHS Label elements, including precautionary statements

**GHS-CA labelling**

Hazard pictograms :

GHS02 GHS04 GHS06 GHS07

Signal word : DANGER

Hazard statements : **EXTREMELY FLAMMABLE GAS**
CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED
FATAL IF INHALED
MAY CAUSE RESPIRATORY IRRITATION
MAY FORM EXPLOSIVE MIXTURES WITH AIR
SYMPTOMS MAY BE DELAYED
EXTENDED EXPOSURE TO GAS REDUCES THE ABILITY TO SMELL SULFIDES

Precautionary statements : Do not handle until all safety precautions have been read and understood
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

| | | |
|---|---|---|
| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |

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# Hydrogen sulfide

Safety Data Sheet E-4611

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 08-10-2016 Supersedes: 10-15-2013

Do not breathe gas
Use and store only outdoors or in a well-ventilated area
Avoid release to the environment
Wear protective gloves, protective clothing, eye protection, respiratory protection, and/or face protection
Leaking gas fire: Do not extinguish, unless leak can be stopped safely
In case of leakage, eliminate all ignition sources
Store locked up
Dispose of contents/container in accordance with container Supplier/owner instructions
Protect from sunlight when ambient temperature exceeds 52°C (125°F)
Close valve after each use and when empty
Do not open valve until connected to equipment prepared for use
When returning cylinder, install leak tight valve outlet cap or plug
Do not depend on odour to detect the presence of gas

### 2.3. Other hazards

Other hazards not contributing to the classification : Contact with liquid may cause cold burns/frostbite.

### 2.4. Unknown acute toxicity (GHS-CA)

No data available

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

| Name | CAS No. | % (Vol.) | Common Name (synonyms) |
|---|---|---|---|
| Hydrogen sulfide (Main constituent) | (CAS No) 7783-06-4 | 100 | Hydrogen sulfide (H2S) / Hydrogen sulphide / Sulfur hydride / Sulfureted hydrogen / Dihydrogen sulphide / Hydrogensulfide |

### 3.2. Mixtures

Not applicable

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

First-aid measures after inhalation : Remove to fresh air and keep at rest in a position comfortable for breathing. If not breathing, give artificial respiration. If breathing is difficult, trained personnel should give oxygen. Call a physician.

First-aid measures after skin contact : The liquid may cause frostbite. For exposure to liquid, immediately warm frostbite area with warm water not to exceed 105°F (41°C). Water temperature should be tolerable to normal skin. Maintain skin warming for at least 15 minutes or until normal coloring and sensation have returned to the affected area. In case of massive exposure, remove clothing while showering with warm water. Seek medical evaluation and treatment as soon as possible.

First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes. Hold the eyelids open and away from the eyeballs to ensure that all surfaces are flushed thoroughly. Contact an ophthalmologist immediately.

First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### 4.2. Most important symptoms and effects (acute and delayed)

No additional information available

### 4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment : Obtain medical assistance. Treat with corticosteroid spray as soon as possible after inhalation.

## SECTION 5: Fire-fighting measures

### 5.1. Suitable extinguishing media

Suitable extinguishing media : Carbon dioxide, Dry chemical, Water spray or fog. Use extinguishing media appropriate for surrounding fire.

### 5.2. Unsuitable extinguishing media

No additional information available

### 5.3. Specific hazards arising from the hazardous product

| | |
|---|---|
| Fire hazard | : **EXTREMELY FLAMMABLE GAS**. If venting or leaking gas catches fire, do not extinguish flames. Flammable vapors may spread from leak, creating an explosive reignition hazard. Vapors can be ignited by pilot lights, other flames, smoking, sparks, heaters, electrical equipment, static discharge, or other ignition sources at locations distant from product handling point. Explosive atmospheres may linger. Before entering an area, especially a confined area, check the atmosphere with an appropriate device. |
| Explosion hazard | : **EXTREMELY FLAMMABLE GAS**. Forms explosive mixtures with air and oxidizing agents. |
| Reactivity | : No reactivity hazard other than the effects described in sub-sections below. |
| Reactivity in case of fire | : No reactivity hazard other than the effects described in sub-sections below. |

### 5.4. Special protective equipment and precautions for fire-fighters

| | |
|---|---|
| Firefighting instructions | : **DANGER! Toxic, flammable liquefied gas**<br><br>Evacuate all personnel from the danger area. Use self-contained breathing apparatus (SCBA) and protective clothing. Immediately cool containers with water from maximum distance. Stop flow of gas if safe to do so, while continuing cooling water spray. Remove ignition sources if safe to do so. Remove containers from area of fire if safe to do so. On-site fire brigades must comply with their provincial and local fire code regulations. |
| Special protective equipment for fire fighters | : Standard protective clothing and equipment (Self Contained Breathing Apparatus) for fire fighters. |
| Other information | : Containers are equipped with a pressure relief device. (Exceptions may exist where authorized by TC.). |

## SECTION 6: Accidental release measures

### 6.1. Personal precautions, protective equipment and emergency procedures

| | |
|---|---|
| General measures | : **DANGER! Toxic, flammable liquefied gas** . Forms explosive mixtures with air and oxidizing agents. Immediately evacuate all personnel from danger area. Use self-contained breathing apparatus where needed. Remove all sources of ignition if safe to do so. Reduce vapors with fog or fine water spray, taking care not to spread liquid with water. Shut off flow if safe to do so. Ventilate area or move container to a well-ventilated area. Flammable vapors may spread from leak and could explode if reignited by sparks or flames. Explosive atmospheres may linger. Before entering area, especially confined areas, check atmosphere with an appropriate device. |

### 6.2. Methods and materials for containment and cleaning up

| | |
|---|---|
| Methods for cleaning up | : Try to stop release. Reduce vapour with fog or fine water spray. Prevent waste from contaminating the surrounding environment. Prevent soil and water pollution. Dispose of contents/container in accordance with local/regional/national/international regulations. Contact supplier for any special requirements. |

### 6.3. Reference to other sections

**For further information refer to section 8: Exposure controls/personal protection**

## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

| | |
|---|---|
| Precautions for safe handling | : Leak-check system with soapy water; never use a flame<br><br>All piped systems and associated equipment must be grounded<br><br>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Use only explosion-proof equipment<br><br>Wear leather safety gloves and safety shoes when handling cylinders. Protect cylinders from physical damage; do not drag, roll, slide or drop. While moving cylinder, always keep in place removable valve cover. Never attempt to lift a cylinder by its cap; the cap is intended solely to protect the valve. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Never insert an object (e.g. wrench, screwdriver, pry bar) into cap openings; doing so may damage the valve and cause a leak. Use an adjustable strap wrench to remove over-tight or rusted caps. Slowly open the valve. If the valve is hard to open, discontinue use and contact your supplier. Close the container valve after each use; keep closed even when empty. Never apply flame or localized heat directly to any part of the container. High temperatures may damage the container and could cause the pressure relief device to fail prematurely, venting the container contents. For other precautions in using this product, see section 16. |

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

PRAXAIR

# Hydrogen sulfide

## Safety Data Sheet E-4611

according to the Hazardous Products Regulation (February 11, 2015)

Date of issue: 10-15-1979 Revision date: 08-10-2016 Supersedes: 10-15-2013

### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions : Store only where temperature will not exceed 125°F (52°C). Post "No Smoking/No Open Flames" signs in storage and use areas. There must be no sources of ignition. Separate packages and protect against potential fire and/or explosion damage following appropriate codes and requirements (e.g, NFPA 30, NFPA 55, NFPA 70, and/or NFPA 221 in the U.S.) or according to requirements determined by the Authority Having Jurisdiction (AHJ). Always secure containers upright to keep them from falling or being knocked over. Install valve protection cap, if provided, firmly in place by hand when the container is not in use. Store full and empty containers separately. Use a first-in, first-out inventory system to prevent storing full containers for long periods. For other precautions in using this product, see section 16

**OTHER PRECAUTIONS FOR HANDLING, STORAGE, AND USE:** When handling product under pressure, use piping and equipment adequately designed to withstand the pressures to be encountered. Never work on a pressurized system. Use a back flow preventive device in the piping. Gases can cause rapid suffocation because of oxygen deficiency; store and use with adequate ventilation. If a leak occurs, close the container valve and blow down the system in a safe and environmentally correct manner in compliance with all international, federal/national, state/provincial, and local laws; then repair the leak. Never place a container where it may become part of an electrical circuit.

## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

| Hydrogen sulfide (7783-06-4) | | |
|---|---|---|
| USA - ACGIH | ACGIH TLV-TWA (ppm) | 1 ppm |
| USA - ACGIH | ACGIH TLV-STEL (ppm) | 5 ppm |
| USA - OSHA | OSHA PEL (Ceiling) (ppm) | 20 ppm |
| Canada (Quebec) | VECD (mg/m³) | 21 mg/m³ |
| Canada (Quebec) | VECD (ppm) | 15 ppm |
| Canada (Quebec) | VEMP (mg/m³) | 14 mg/m³ |
| Canada (Quebec) | VEMP (ppm) | 10 ppm |
| Alberta | OEL Ceiling (mg/m³) | 21 mg/m³ |
| Alberta | OEL Ceiling (ppm) | 15 ppm |
| Alberta | OEL TWA (mg/m³) | 14 mg/m³ |
| Alberta | OEL TWA (ppm) | 10 ppm |
| British Columbia | OEL Ceiling (ppm) | 10 ppm |
| Manitoba | OEL STEL (ppm) | 5 ppm |
| Manitoba | OEL TWA (ppm) | 1 ppm |
| New Brunswick | OEL STEL (mg/m³) | 21 mg/m³ |
| New Brunswick | OEL STEL (ppm) | 15 ppm |
| New Brunswick | OEL TWA (mg/m³) | 14 mg/m³ |
| New Brunswick | OEL TWA (ppm) | 10 ppm |
| New Foundland & Labrador | OEL STEL (ppm) | 5 ppm |
| New Foundland & Labrador | OEL TWA (ppm) | 1 ppm |
| Nova Scotia | OEL STEL (ppm) | 5 ppm |
| Nova Scotia | OEL TWA (ppm) | 1 ppm |
| Nunavut | OEL Ceiling (mg/m³) | 28 mg/m³ |
| Nunavut | OEL Ceiling (ppm) | 20 ppm |
| Nunavut | OEL STEL (mg/m³) | 21 mg/m³ |
| Nunavut | OEL STEL (ppm) | 15 ppm |
| Nunavut | OEL TWA (mg/m³) | 14 mg/m³ |
| Nunavut | OEL TWA (ppm) | 10 ppm |
| Northwest Territories | OEL STEL (ppm) | 15 ppm |

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| Hydrogen sulfide (7783-06-4) | | |
|---|---|---|
| Northwest Territories | OEL TWA (ppm) | 10 ppm |
| Ontario | OEL STEL (ppm) | 15 ppm |
| Ontario | OEL TWA (ppm) | 10 ppm |
| Prince Edward Island | OEL STEL (ppm) | 5 ppm |
| Prince Edward Island | OEL TWA (ppm) | 1 ppm |
| Québec | VECD (mg/m³) | 21 mg/m³ |
| Québec | VECD (ppm) | 15 ppm |
| Québec | VEMP (mg/m³) | 14 mg/m³ |
| Québec | VEMP (ppm) | 10 ppm |
| Saskatchewan | OEL STEL (ppm) | 15 ppm |
| Saskatchewan | OEL TWA (ppm) | 10 ppm |
| Yukon | OEL STEL (mg/m³) | 27 mg/m³ |
| Yukon | OEL STEL (ppm) | 15 ppm |
| Yukon | OEL TWA (mg/m³) | 15 mg/m³ |
| Yukon | OEL TWA (ppm) | 10 ppm |

### 8.2. Appropriate engineering controls

Appropriate engineering controls : Use corrosion-resistant equipment. Use an explosion-proof local exhaust system. Local exhaust and general ventilation must be adequate to meet exposure standards. MECHANICAL (GENERAL): **Inadequate - Use only in a closed system.** Use explosion proof equipment and lighting.

### 8.3. Individual protection measures/Personal protective equipment

Personal protective equipment : Safety glasses. Face shield. Gloves.

Hand protection : Wear work gloves when handling containers. Wear heavy rubber gloves where contact with product may occur.

Eye protection : Wear goggles and a face shield when transfilling or breaking transfer connections. Select in accordance with the current CSA standard Z94.3, "Industrial Eye and Face Protection", and any provincial regulations, local bylaws or guidelines.

Respiratory protection : **Respiratory protection:** Use respirable fume respirator or air supplied respirator when working in confined space or where local exhaust or ventilation does not keep exposure below TLV. Select in accordance with provincial regulations, local bylaws or guidelines. Selection should be based on the current CSA standard Z94.4, "Selection, Care, and Use of Respirators." Respirators should also be approved by NIOSH and MSHA. For emergencies or instances with unknown exposure levels, use a self-contained breathing apparatus (SCBA).

Thermal hazard protection : Wear cold insulating gloves when transfilling or breaking transfer connections. Standard EN 511 - Cold insulating gloves.

Other information : **Other protection** : Safety shoes for general handling at customer sites. Metatarsal shoes and cuffless trousers for cylinder handling at packaging and filling plants. Select in accordance with the current CSA standard Z195, "Protective Foot Wear", and any provincial regulations, local bylaws or guidelines. For working with flammable and oxidizing materials, consider the use of flame resistant anti-static safety clothing.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

Physical state : Gas

Appearance : Colorless gas. Colorless liquid at low temperature or under high pressure.

Molecular mass : 34 g/mol

Colour : Colourless.

Odour : Odour can persist. Poor warning properties at low concentrations. Rotten eggs.

Odour threshold : Odour threshold is subjective and inadequate to warn of overexposure.

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| | | |
|---|---|---|
| pH | : | Not applicable. |
| pH solution | : | No data available |
| Relative evaporation rate (butylacetate=1) | : | No data available |
| Relative evaporation rate (ether=1) | : | Not applicable. |
| Melting point | : | -86 °C |
| Freezing point | : | -82.9 °C |
| Boiling point | : | -60.3 °C |
| Flash point | : | Not applicable. |
| Critical temperature | : | 100.4 °C |
| Auto-ignition temperature | : | 260 °C |
| Decomposition temperature | : | No data available |
| Vapour pressure | : | 1880 kPa |
| Vapour pressure at 50 °C | : | No data available |
| Critical pressure | : | 8940 kPa |
| Relative vapour density at 20 °C | : | >= |
| Relative density | : | No data available |
| Relative density of saturated gas/air mixture | : | No data available |
| Density | : | No data available |
| Relative gas density | : | 1.2 |
| Solubility | : | Water: 3980 mg/l |
| Log Pow | : | Not applicable. |
| Log Kow | : | Not applicable. |
| Viscosity, kinematic | : | Not applicable. |
| Viscosity, dynamic | : | Not applicable. |
| Viscosity, kinematic (calculated value) (40 °C) | : | No data available |
| Explosive properties | : | Not applicable. |
| Oxidizing properties | : | None. |
| Flammability (solid, gas) | : | 4.3 - 46 vol % |

### 9.2. Other information

| | | |
|---|---|---|
| Gas group | : | Liquefied gas |
| Additional information | : | Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level |

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

| | | |
|---|---|---|
| Reactivity | : | No reactivity hazard other than the effects described in sub-sections below. |
| Chemical stability | : | Stable under normal conditions. |
| Possibility of hazardous reactions | : | May react violently with oxidants. Can form explosive mixture with air. |
| Conditions to avoid | : | Avoid moisture in installation systems. Keep away from heat/sparks/open flames/hot surfaces. – No smoking. |
| Incompatible materials | : | Ammonia. Bases. Bromine pentafluoride. Chlorine trifluoride. chromium trioxide. (and heat). Copper. (powdered). Fluorine. Lead. Lead oxide. Mercury. Nitric acid. Nitrogen trifluoride. nitrogen sulfide. Organic compounds. Oxidizing agents. Oxygen difluoride. Rubber. Sodium. (and moisture). Water. |
| Hazardous decomposition products | : | Thermal decomposition may produce : Sulfur. Hydrogen. |

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

| | | |
|---|---|---|
| Acute toxicity (oral) | : | Not classified |
| Acute toxicity (dermal) | : | Not classified |

Acute toxicity (inhalation) : Inhalation:gas: FATAL IF INHALED.

| Hydrogen sulfide ( \f )7783-06-4 | |
|---|---|
| LC50 inhalation rat (mg/l) | 0.99 mg/l (Exposure time: 1 h) |
| LC50 inhalation rat (ppm) | 356 ppm/4h |
| ATE CA (gases) | 356.00000000 ppmv/4h |
| ATE CA (vapours) | 0.99000000 mg/l/4h |
| ATE CA (dust,mist) | 0.99000000 mg/l/4h |

Skin corrosion/irritation : Not classified
pH: Not applicable.

Serious eye damage/irritation : Not classified
pH: Not applicable.

Respiratory or skin sensitization : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

Reproductive toxicity : Not classified

Specific target organ toxicity (single exposure) : MAY CAUSE RESPIRATORY IRRITATION.

Specific target organ toxicity (repeated exposure) : Not classified

Aspiration hazard : Not classified

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecology - general : VERY TOXIC TO AQUATIC LIFE.

| Hydrogen sulfide (7783-06-4) | |
|---|---|
| LC50 fish 1 | 0.0448 mg/l (Exposure time: 96 h - Species: Lepomis macrochirus [flow-through]) |
| LC50 fish 2 | 0.016 mg/l (Exposure time: 96 h - Species: Pimephales promelas [flow-through]) |

### 12.2. Persistence and degradability

| Hydrogen sulfide (7783-06-4) | |
|---|---|
| Persistence and degradability | Not applicable for inorganic gases. |

### 12.3. Bioaccumulative potential

| Hydrogen sulfide (7783-06-4) | |
|---|---|
| BCF fish 1 | (no bioaccumulation expected) |
| Log Pow | Not applicable. |
| Log Kow | Not applicable. |
| Bioaccumulative potential | No data available. |

### 12.4. Mobility in soil

| Hydrogen sulfide (7783-06-4) | |
|---|---|
| Mobility in soil | No data available. |
| Log Pow | Not applicable. |
| Log Kow | Not applicable. |
| Ecology - soil | Because of its high volatility, the product is unlikely to cause ground or water pollution. |

### 12.5. Other adverse effects

Other adverse effects : May cause pH changes in aqueous ecological systems.

Effect on the ozone layer : None

Effect on global warming : No known effects from this product

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

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## SECTION 13: Disposal considerations

### 13.1. Disposal methods

Waste disposal recommendations : Do not attempt to dispose of residual or unused quantities. Return container to supplier.

## SECTION 14: Transport information

### 14.1. Basic shipping description

In accordance with TDG

**TDG**

| | |
|---|---|
| UN-No. (TDG) | : UN1053 |
| TDG Primary Hazard Classes | : 2.3 - Class 2.3 - Toxic Gas. |
| TDG Subsidiary Classes | : 2.1 |
| Proper shipping name | : HYDROGEN SULPHIDE |
| ERAP Index | : 500 |
| Explosive Limit and Limited Quantity Index | : 0 |
| Passenger Carrying Ship Index | : Forbidden |
| Passenger Carrying Road Vehicle or Passenger Carrying Railway Vehicle Index | : Forbidden |

### 14.3. Air and sea transport

**IMDG**

| | |
|---|---|
| UN-No. (IMDG) | : 1053 |
| Proper Shipping Name (IMDG) | : HYDROGEN SULPHIDE |
| Class (IMDG) | : 2 - Gases |
| MFAG-No | : 117 |

**IATA**

| | |
|---|---|
| UN-No. (IATA) | : 1053 |
| Proper Shipping Name (IATA) | : Hydrogen sulphide |
| Class (IATA) | : 2 |

## SECTION 15: Regulatory information

### 15.1. National regulations

**Hydrogen sulfide (7783-06-4)**

Listed on the Canadian DSL (Domestic Substances List)

### 15.2. International regulations

**Hydrogen sulfide (7783-06-4)**

Listed on the AICS (Australian Inventory of Chemical Substances)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on the Korean ECL (Existing Chemicals List)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the United States TSCA (Toxic Substances Control Act) inventory
Listed on INSQ (Mexican national Inventory of Chemical Substances)

## SECTION 16: Other information

| | |
|---|---|
| Date of issue | : 15/10/1979 |
| Revision date | : 10/08/2016 |
| Supersedes | : 15/10/2013 |

Indication of changes:

Training advice : Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard. Ensure operators understand the flammability hazard.

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

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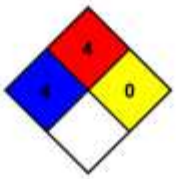
| | | |
|---|---|---|
| Other information | : | When you mix two or more chemicals, you can create additional, unexpected hazards. Obtain and evaluate the safety information for each component before you produce the mixture. Consult an industrial hygienist or other trained person when you evaluate the end product. Before using any plastics, confirm their compatibility with this product<br><br>Praxair asks users of this product to study this SDS and become aware of the product hazards and safety information. To promote safe use of this product, a user should (1) notify employees, agents, and contractors of the information in this SDS and of any other known product hazards and safety information, (2) furnish this information to each purchaser of the product, and (3) ask each purchaser to notify its employees and customers of the product hazards and safety information<br><br>The opinions expressed herein are those of qualified experts within Praxair Canada Inc. We believe that the information contained herein is current as of the date of this Safety Data Sheet. Since the use of this information and the conditions of use are not within the control of Praxair Canada Inc, it is the user's obligation to determine the conditions of safe use of the product. Praxair Canada Inc, SDSs are furnished on sale or delivery by Praxair Canada Inc, or the independent distributors and suppliers who package and sell our products. To obtain current SDSs for these products, contact your Praxair sales representative, local distributor, or supplier, or download from www.praxair.ca. If you have questions regarding Praxair SDSs, would like the document number and date of the latest SDS, or would like the names of the Praxair suppliers in your area, phone or write Praxair Canada Inc, (Phone: 1-888-257-5149; Address: Praxair Canada Inc, 1 City Centre Drive, Suite 1200, Mississauga, Ontario, L5B 1M2).<br><br>PRAXAIR and the Flowing Airstream design are trademarks or registered trademarks of Praxair Technology, Inc. in the United States and/or other countries. |
| NFPA health hazard | : | 4 - Very short exposure could cause death or serious residual injury even though prompt medical attention was given. |
| NFPA fire hazard | : | 4 - Will rapidly or completely vaporize at normal pressure and temperature, or is readily dispersed in air and will burn readily. |
| NFPA reactivity | : | 0 - Normally stable, even under fire exposure conditions, and are not reactive with water. |




HMIS III Rating

| | | |
|---|---|---|
| Health | : | 2 Moderate Hazard - Temporary or minor injury may occur |
| Flammability | : | 4 Severe Hazard - Flammable gases, or very volatile flammable liquids with flash points below 73 F, and boiling points below 100 F. Materials may ignite spontaneously with air. (Class IA) |
| Physical | : | 2 Moderate Hazard - Materials that are unstable and may undergo violent chemical changes at normal temperature and pressure with low risk for explosion. Materials may react violently with water or form peroxides upon exposure to air. |

SDS Canada (GHS) - Praxair

*This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.*

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

Appendix B
$SO_2$ SDS

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# Safety Data Sheet

**Material Name: SULFUR DIOXIDE** **SDS ID: MAT22290**

## Section 1 - PRODUCT AND COMPANY IDENTIFICATION

**Material Name**
SULFUR DIOXIDE
**Synonyms**
MTG MSDS 80; SULFUROUS ACID ANHYDRIDE; SULFUROUS OXIDE; SULPHUR DIOXIDE; SULFUROUS ANHYDRIDE; FERMENTICIDE LIQUID; SULFUR DIOXIDE(SO2); SULFUR OXIDE; SULFUR OXIDE(SO2)
**Chemical Family**
inorganic, gas
**Product Description**
Classification determined in accordance with Compressed Gas Association standards.
**Product Use**
Industrial and Specialty Gas Applications.
**Restrictions on Use**
None known.
**Details of the supplier of the safety data sheet**
MATHESON TRI-GAS, INC.
3 Mountainview Road
Warren, NJ 07059
General Information: 1-800-416-2505
Emergency #: 1-800-424-9300 (CHEMTREC)
Outside the US: 703-527-3887 (Call collect)

## Section 2 - HAZARDS IDENTIFICATION

**Classification in accordance with paragraph (d) of 29 CFR 1910.1200.**
Gases Under Pressure - Liquefied gas
Acute Toxicity - Inhalation - Gas - Category 3
Skin Corrosion/Irritation - Category 1B
Serious Eye Damage/Eye Irritation - Category 1
Simple Asphyxiant
**GHS Label Elements**
**Symbol(s)**

**Signal Word**
Danger
**Hazard Statement(s)**
Contains gas under pressure; may explode if heated.
Toxic if inhaled.
Causes severe skin burns and eye damage.
May displace oxygen and cause rapid suffocation.
**Precautionary Statement(s)**
**Prevention**
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

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## Safety Data Sheet

**Material Name: SULFUR DIOXIDE** **SDS ID: MAT22290**

Wash thoroughly after handling.
Do not breathe dusts or mists.

**Response**

IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
Immediately call a POISON CENTER or doctor.
Specific treatment (see label).

**Storage**

Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Protect from sunlight.

**Disposal**

Dispose of contents/container in accordance with local/regional/national/international regulations.

**Other Hazards**

Contact with liquified gas may cause frostbite.

### Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

| CAS | Component Name | Percent |
|---|---|---|
| 7446-09-5 | Sulfur dioxide | 100.0 |

### Section 4 - FIRST AID MEASURES

**Inhalation**

IF INHALED: Remove person to fresh air and keep at rest in a position comfortable for breathing. Get immediate medical attention.

**Skin**

IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower. Wash contaminated clothing before reuse. If frostbite or freezing occur, immediately flush with plenty of lukewarm water (105-115°F; 41-46°C). If warm water is not available, gently wrap affected parts in blankets. DO NOT induce vomiting. Get immediate medical attention.

**Eyes**

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get immediate medical attention.

**Ingestion**

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Get immediate medical attention.

**Most Important Symptoms/Effects**

**Acute**

Toxic if inhaled, frostbite, suffocation, respiratory tract burns, skin burns, eye burns

**Delayed**

No information on significant adverse effects.

**Indication of any immediate medical attention and special treatment needed**

Treat symptomatically and supportively.

**Note to Physicians**

For inhalation, consider oxygen.

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

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## Safety Data Sheet

**Material Name: SULFUR DIOXIDE** **SDS ID: MAT22290**

### Section 5 - FIRE FIGHTING MEASURES

**Extinguishing Media**

**Suitable Extinguishing Media**

carbon dioxide, regular dry chemical, Large fires: Use regular foam or flood with fine water spray.

**Unsuitable Extinguishing Media**

None known.

**Special Hazards Arising from the Chemical**

Negligible fire hazard.

**Hazardous Combustion Products**

sulfur oxides

**Fire Fighting Measures**

Move container from fire area if it can be done without risk. Cool containers with water spray until well after the fire is out. Stay away from the ends of tanks. Keep unnecessary people away, isolate hazard area and deny entry.

**Special Protective Equipment and Precautions for Firefighters**

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

### Section 6 - ACCIDENTAL RELEASE MEASURES

**Personal Precautions, Protective Equipment and Emergency Procedures**

Wear personal protective clothing and equipment, see Section 8.

**Methods and Materials for Containment and Cleaning Up**

Keep unnecessary people away, isolate hazard area and deny entry. Stay upwind and keep out of low areas. Ventilate closed spaces before entering. Evacuation radius: 150 feet. Stop leak if possible without personal risk. Reduce vapors with water spray. Do not get water directly on material.

**Environmental Precautions**

Avoid release to the environment.

### Section 7 - HANDLING AND STORAGE

**Precautions for Safe Handling**

Do not get in eyes, on skin, or on clothing. Do not breathe gas, fumes, vapor, or spray. Wash hands thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection. Contaminated work clothing should not be allowed out of the workplace. Do not eat, drink or smoke when using this product. Keep only in original container. Avoid release to the environment.

**Conditions for Safe Storage, Including any Incompatibilities**

Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Protect from sunlight.
Store and handle in accordance with all current regulations and standards. Protect from physical damage. Store outside or in a detached building. Keep separated from incompatible substances.

**Incompatible Materials**

bases, combustible materials, halogens, metal carbide, metal oxides, metals, oxidizing materials, peroxides, reducing agents

### Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

**Component Exposure Limits**

| **Sulfur dioxide** | **7446-09-5** |
|---|---|
| ACGIH: | 0.25 ppm STEL |

| | | |
|---|---|---|
| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |

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## Safety Data Sheet

**Material Name: SULFUR DIOXIDE** **SDS ID: MAT22290**

| | |
|---|---|
| NIOSH: | 2 ppm TWA ; 5 mg/m3 TWA |
| | 5 ppm STEL ; 13 mg/m3 STEL |
| | 100 ppm IDLH |
| OSHA (US): | 5 ppm TWA ; 13 mg/m3 TWA |
| Mexico: | 0.25 ppm STEL [PPT-CT ] |

**ACGIH - Threshold Limit Values - Biological Exposure Indices (BEI)**
There are no biological limit values for any of this product's components.
**Engineering Controls**
Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.
**Individual Protection Measures, such as Personal Protective Equipment**
**Eye/face protection**
Wear splash resistant safety goggles with a faceshield. Contact lenses should not be worn. Provide an emergency eye wash fountain and quick drench shower in the immediate work area.
**Skin Protection**
Wear appropriate chemical resistant clothing. Wear chemical resistant clothing to prevent skin contact.
**Respiratory Protection**
Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.
**Glove Recommendations**
Wear appropriate chemical resistant gloves.

**Section 9 - PHYSICAL AND CHEMICAL PROPERTIES**

| | | | |
|---|---|---|---|
| **Appearance** | colorless gas | **Physical State** | gas |
| **Odor** | irritating odor | **Color** | colorless |
| **Odor Threshold** | 3 - 5 ppm | **pH** | (Acidic in solution ) |
| **Melting Point** | -73 °C (-99 °F ) | **Boiling Point** | -10 °C (14 °F ) |
| **Boiling Point Range** | Not available | **Freezing point** | Not available |
| **Evaporation Rate** | >1 (Butyl acetate = 1 ) | **Flammability (solid, gas)** | Not available |
| **Autoignition Temperature** | Not available | **Flash Point** | (Not flammable ) |
| **Lower Explosive Limit** | Not available | **Decomposition temperature** | Not available |
| **Upper Explosive Limit** | Not available | **Vapor Pressure** | 2432 mmHg @ 20 °C |
| **Vapor Density (air=1)** | 2.26 | **Specific Gravity (water=1)** | 1.462 at -10 °C |

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|---|---|---|

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## Safety Data Sheet

**Material Name: SULFUR DIOXIDE** **SDS ID: MAT22290**

| | | | |
|---|---|---|---|
| **Water Solubility** | 22.8 % (@ 0 °C ) | **Partition coefficient: n-octanol/water** | Not available |
| **Viscosity** | Not available | **Kinematic viscosity** | Not available |
| **Solubility (Other)** | Not available | **Density** | Not available |
| **Physical Form** | liquified gas | **Molecular Formula** | S-O2 |
| **Molecular Weight** | 64.06 | | |

**Solvent Solubility**
**Soluble**
alcohol, acetic acid, sulfuric acid, ether, chloroform, Benzene, sulfuryl chloride, nitrobenzenes, Toluene, acetone

### Section 10 - STABILITY AND REACTIVITY

**Reactivity**
No reactivity hazard is expected.
**Chemical Stability**
Stable at normal temperatures and pressure.
**Possibility of Hazardous Reactions**
Will not polymerize.
**Conditions to Avoid**
Minimize contact with material. Containers may rupture or explode if exposed to heat.
**Incompatible Materials**
bases, combustible materials, halogens, metal carbide, metal oxides, metals, oxidizing materials, peroxides, reducing agents
**Hazardous decomposition products**
oxides of sulfur

### Section 11 - TOXICOLOGICAL INFORMATION

**Information on Likely Routes of Exposure**
**Inhalation**
Toxic if inhaled. Causes damage to respiratory system, burns, difficulty breathing
**Skin Contact**
skin burns
**Eye Contact**
eye burns
**Ingestion**
burns, nausea, vomiting, diarrhea, stomach pain
**Acute and Chronic Toxicity**
**Component Analysis - LD50/LC50**
The components of this material have been reviewed in various sources and the following selected endpoints are published:
**Sulfur dioxide (7446-09-5)**
Inhalation LC50 Rat 965 - 1168 ppm 4 h
**Product Toxicity Data**
**Acute Toxicity Estimate**
No data available.
**Immediate Effects**

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**Material Name: SULFUR DIOXIDE** **SDS ID: MAT22290**

Toxic if inhaled, frostbite, suffocation, respiratory tract burns, skin burns, eye burns

**Delayed Effects**
No information on significant adverse effects.

**Irritation/Corrosivity Data**
respiratory tract burns, skin burns, eye burns

**Respiratory Sensitization**
No data available.

**Dermal Sensitization**
No data available.

**Component Carcinogenicity**

| **Sulfur dioxide** | **7446-09-5** |
|---|---|
| ACGIH: | A4 - Not Classifiable as a Human Carcinogen |
| IARC: | Monograph 54 [1992] (Group 3 (not classifiable)) |

**Germ Cell Mutagenicity**
No data available.

**Tumorigenic Data**
No data available

**Reproductive Toxicity**
No data available.

**Specific Target Organ Toxicity - Single Exposure**
No target organs identified.

**Specific Target Organ Toxicity - Repeated Exposure**
No target organs identified.

**Aspiration hazard**
Not applicable.

**Medical Conditions Aggravated by Exposure**
respiratory disorders

### Section 12 - ECOLOGICAL INFORMATION

**Component Analysis - Aquatic Toxicity**
No LOLI ecotoxicity data are available for this product's components.

**Persistence and Degradability**
No data available.

**Bioaccumulative Potential**
No data available.

**Mobility**
No data available.

### Section 13 - DISPOSAL CONSIDERATIONS

**Disposal Methods**
Dispose of contents/container in accordance with local/regional/national/international regulations.

**Component Waste Numbers**
The U.S. EPA has not published waste numbers for this product's components.

### Section 14 - TRANSPORT INFORMATION

**US DOT Information:**
**Shipping Name:** SULFUR DIOXIDE

| | | |
|---|---|---|
| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |

| Permian Resources Corporation | $H_2S$ Contingency Plan<br>Caveman 171H, 121H, 172H, 122H, 132H, 133H, 173H, 123H, 174H, 113H, 114H, 111H, 112H, 421H, 423H, 221H, 222H, 223H, 124H, 224H, 134H, 424H | Eddy County, New Mexico |
|---|---|---|

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## Safety Data Sheet

**Material Name: SULFUR DIOXIDE** **SDS ID: MAT22290**

**Hazard Class:** 2.3
**UN/NA #:** UN1079
**Required Label(s):** 2.3

**IMDG Information:**
**Shipping Name:** SULPHUR DIOXIDE
**Hazard Class:** 2.3
**UN#:** UN1079
**Required Label(s):** 2.3

**TDG Information:**
**Shipping Name:** SULFUR DIOXIDE
**Hazard Class:** 2.3
**UN#:** UN1079
**Required Label(s):** 2.3
**International Bulk Chemical Code**
This material does not contain any chemicals required by the IBC Code to be identified as dangerous chemicals in bulk.

### Section 15 - REGULATORY INFORMATION

**U.S. Federal Regulations**
This material contains one or more of the following chemicals required to be identified under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), CERCLA (40 CFR 302.4), TSCA 12(b), and/or require an OSHA process safety plan.

| | |
|---|---|
| **Sulfur dioxide** | **7446-09-5** |
| SARA 302: | 500 lb TPQ |
| OSHA (safety): | 1000 lb TQ (Liquid ) |
| SARA 304: | 500 lb EPCRA RQ |

**SARA Section 311/312 (40 CFR 370 Subparts B and C) reporting categories**
Gas Under Pressure; Acute toxicity; Skin Corrosion/Irritation; Serious Eye Damage/Eye Irritation; Simple Asphyxiant
**U.S. State Regulations**
The following components appear on one or more of the following state hazardous substances lists:

| Component | CAS | CA | MA | MN | NJ | PA |
|---|---|---|---|---|---|---|
| **Sulfur dioxide** | **7446-09-5** | Yes | Yes | Yes | Yes | Yes |

**California Safe Drinking Water and Toxic Enforcement Act (Proposition 65)**

**WARNING**

This product can expose you to chemicals including Sulfur dioxide , which is known to the State of California to cause birth defects or other reproductive harm. For more information go to www.P65Warnings.ca.gov.

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## Safety Data Sheet

**Material Name: SULFUR DIOXIDE** **SDS ID: MAT22290**

| | |
|---|---|
| **Sulfur dioxide** | **7446-09-5** |
| Repro/Dev. Tox | developmental toxicity , 7/29/2011 |

**Component Analysis - Inventory**
**Sulfur dioxide (7446-09-5)**

| US | CA | AU | CN | EU | JP - ENCS | JP - ISHL | KR KECI - Annex 1 | KR KECI - Annex 2 |
|---|---|---|---|---|---|---|---|---|
| Yes | DSL | Yes | Yes | EIN | Yes | Yes | Yes | No |

| KR - REACH CCA | MX | NZ | PH | TH-TECI | TW, CN | VN (Draft) |
|---|---|---|---|---|---|---|
| No | Yes | Yes | Yes | Yes | Yes | Yes |

### Section 16 - OTHER INFORMATION

**NFPA Ratings**
Health: 3 Fire: 0 Instability: 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

**Summary of Changes**
SDS update: 02/10/2016

**Key / Legend**
ACGIH - American Conference of Governmental Industrial Hygienists; ADR - European Road Transport; AU - Australia; BOD - Biochemical Oxygen Demand; C - Celsius; CA - Canada; CA/MA/MN/NJ/PA - California/Massachusetts/Minnesota/New Jersey/Pennsylvania*; CAS - Chemical Abstracts Service; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CFR - Code of Federal Regulations (US); CLP - Classification, Labelling, and Packaging; CN - China; CPR - Controlled Products Regulations; DFG - Deutsche Forschungsgemeinschaft; DOT - Department of Transportation; DSD - Dangerous Substance Directive; DSL - Domestic Substances List; EC – European Commission; EEC - European Economic Community; EIN - European Inventory of (Existing Commercial Chemical Substances); EINECS - European Inventory of Existing Commercial Chemical Substances; ENCS - Japan Existing and New Chemical Substance Inventory; EPA - Environmental Protection Agency; EU - European Union; F - Fahrenheit; F - Background (for Venezuela Biological Exposure Indices); IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IDL - Ingredient Disclosure List; IDLH - Immediately Dangerous to Life and Health; IMDG - International Maritime Dangerous Goods; ISHL - Japan Industrial Safety and Health Law; IUCLID - International Uniform Chemical Information Database; JP - Japan; Kow - Octanol/water partition coefficient; KR KECI Annex 1 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL); KR KECI Annex 2 - Korea Existing Chemicals Inventory (KECI) / Korea Existing Chemicals List (KECL) , KR - Korea; LD50/LC50 - Lethal Dose/ Lethal Concentration; KR REACH CCA - Korea Registration and Evaluation of Chemical Substances Chemical Control Act; LEL - Lower Explosive Limit; LLV - Level Limit Value; LOLI - List Of LIsts™ - ChemADVISOR's Regulatory Database; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; MX – Mexico; Ne- Non-specific; NFPA - National Fire Protection Agency; NIOSH - National Institute for Occupational Safety and Health; NJTSR - New Jersey Trade Secret Registry; Nq - Non-quantitative; NSL – Non-Domestic Substance List (Canada); NTP - National Toxicology Program; NZ - New Zealand; OSHA - Occupational Safety and Health Administration; PEL- Permissible Exposure Limit; PH - Philippines; RCRA - Resource Conservation and Recovery Act; REACH- Registration, Evaluation, Authorisation, and restriction of Chemicals; RID - European Rail Transport; SARA - Superfund Amendments and Reauthorization Act; Sc - Semi-quantitative; STEL - Short-term Exposure Limit;

| | | |
|---|---|---|
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