ATS-13-276

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Form 3160-3
(March 2012)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

# APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
SHL: NM067132; BHL: NM030752

6. If Indian, Allotee or Tribe Name
N/A

1a. Type of work: ☑ DRILL ☐ REENTER

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

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

8. Lease Name and Well No.
WAR HORSE FED COM #3H <39654>

2. Name of Operator MURCHISON OIL & GAS, INC. <15363>

9. API Well No.
30-015-41227

3a. Address 1100 MIRA VISTA BLVD.
PLANO, TX 75093

3b. Phone No. (include area code)
972-931-0700

10. Field and Pool, or Exploratory
WILDCAT E-84 S182922M; BS
~~PALMILLO; BONE SPRING, NORTH~~ <97908>

4. Location of Well (Report location clearly and in accordance with any State requirements.*)
At surface 2290' FSL & 175' FEL
At proposed prod. zone 2290' FSL & 330' FWL

11. Sec., T. R. M. or Blk. and Survey or Area
SEC. 21, T18S R29E

14. Distance in miles and direction from nearest town or post office*
Approximately 10 miles SW of Loco Hills Post Office

12. County or Parish
EDDY

13. State
NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) BHL: ~~330'~~ FWL SEC. 21 (NM 030752 LEASE LINE) 175'

16. No. of acres in lease
SHL: NM067132 = 160 ac
BHL: NM030752 = 840 ac

17. Spacing Unit dedicated to this well
160 ac

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. SEE 1-MILE RADIUS MAP

19. Proposed Depth
~~7788~~
~~7,800~~' TVD
12,216' MD

20. BLM/BIA Bond No. on file
NN 2163

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3,479' GL

22. Approximate date work will start*
02/01/2013

23. Estimated duration
36 DAYS

## 24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature
Name (Printed/Typed) JACK RANKIN
Date 12/11/2012

Title
VICE PRESIDENT OPERATIONS

Approved by (Signature) /s/ Don Peterson
Name (Printed/Typed)
Date MAR 20 2013

Title FIELD MANAGER
Office CARLSBAD FIELD OFFICE

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

APPROVAL FOR TWO YEARS

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

(Continued on page 2)

*(Instructions on page 2)

Roswell Controlled Water Basin

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SEE ATTACHED FOR
CONDITIONS OF APPROVAL

Approval Subject to General Requirements
& Special Stipulations Attached

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
District III
1000 Rio Brazos Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

# WELL LOCATION AND ACREAGE DEDICATION PLAT

| [1] API Number | [2] Pool Code | [3] Pool Name |
|---|---|---|
| 30-015-41227 | ~~49554~~ 97908 | WILDCAT; G-04 S182727M; B.S. ~~PALMILLO; BONE SPRING, NORTH~~ |

| [4] Property Code | [5] Property Name | [6] Well Number |
|---|---|---|
| 39654 | WAR HORSE FED COM | 3H |

| [7] OGRID No. | [8] Operator Name | [9] Elevation |
|---|---|---|
| 15363 | MURCHISON OIL AND GAS, INC. | 3479.3 |

## [10] Surface Location

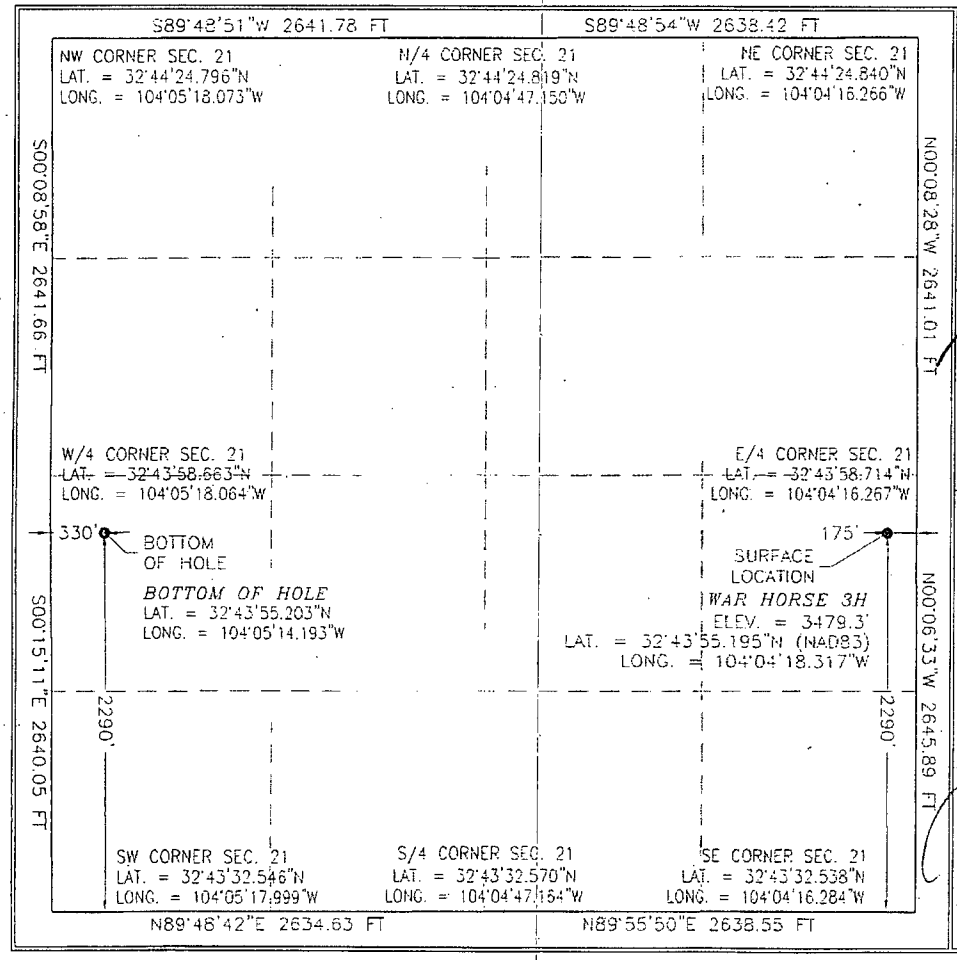
| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| I | 21 | 18 S | 29 E | | 2290 | SOUTH | 175 | EAST | EDDY |

## [11] Bottom Hole Location If Different From Surface

| UL or lot no. | Section | Township | Range | Lot Idn | Feet from the | North/South line | Feet from the | East/West line | County |
|---|---|---|---|---|---|---|---|---|---|
| L | 21 | 18 S | 29 E | | 2290 | SOUTH | 330 | WEST | EDDY |

| [12] Dedicated Acres | [13] Joint or Infill | [14] Consolidation Code | [15] Order No. |
|---|---|---|---|
| 160 | | | |

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.




## [17] OPERATOR CERTIFICATION

*I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.*

Signature — Date: 10/16/12

Jack Rankin, VP Operations
Printed Name

jrankin@jdmii.com
E-mail Address

## [18] SURVEYOR CERTIFICATION

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

SEPTEMBER 24, 2012
Date of Survey

Signature and Seal of Professional Surveyor

Certificate Number: FILIMON F. JARAMILLO, PLS 12797

SURVEY NO. 1245A

**Murchison Oil & Gas, Inc.**
**War Horse Fed Com #3H**
**SL: 2290' FSL & 175' FEL, Lot I, Sec. 21, T18S, R29E**
**BHL: 2290' FSL & 330' FWL, Lot L, Sec. 21, T18S, R29E**
**Eddy County, New Mexico**

## OPERATOR CERTIFICATION

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

Executed this 7th day of December 2012.

Jack Rankin, Vice President Operations
Murchison Oil & Gas, Inc.
1100 Mira Vista Blvd.
Plano, TX 75093
972-931-0700 Office
713-582-3859 Cell
jrankin@jdmii.com

Field Representatives:
Anson Bouttee
Dave Pace
469-533-5092
companyman1@jdmii.com

# Murchison Oil & Gas, Inc.
# Drilling Prognosis
# War Horse Fed Com #3H

**Revision date: January 4, 2013**

| | |
|---|---|
| Surface Location: | 630,131.98usft N, 621,773.05usft E<br>2290' FSL, 175' FEL |
| Bottom Hole Target: | 630,104.51usft N, 616,988.47usft E<br>2290' FSL, 330' FWL |
| | Section 21, T-18-S, R-29-E<br>Eddy County, New Mexico |
| Planned Total Depth: | 7788' TVD /12184' MD |
| RKB: 3495' | GL: 3479' |
| Preparer: | Steve Morris |

**Estimated Formation Tops (per geoprognosis with TVD's adjusted to actual KB):**

No fresh water zones to report as per the New Mexico Water Rights Search. See attached POD.

| Formation | TVD (ft) | Subsea (ft) | Thickness | Type |
|---|---|---|---|---|
| Quaternary Alluvium* | Surface | | | |
| Salt | 295 | -3200' | | |
| Salt Base | 825 | -2670 | | |
| Tansil | 915 | -2580' | | |
| Yates | 1125 | -2370' | | |
| Seven Rivers | 1425 | -2070' | 620' | Hydrocarbon |
| Queen | 2050 | -1445' | | |
| Grayburg | 2395 | -1100' | 500' | Hydrocarbon |
| San Andres | 2895 | 600' | 1050' | Hydrocarbon |
| Bone Spring Lime** | 3960 | 465' | | |
| First Bone Spring Sand | 6677 | 3180' | 200' | Hydrocarbon |
| Second Bone Spring Sand | 7583 | 4202' | 400' | Hydrocarbon |

*The Rustler formation is above the Salado (salt), however it is eroded this far west. Nobody reports any tops above the salt and nobody logs it, so the only information I have of it are a few wells with lithology reports. The most likely thing is Quaternary alluvium, consisting of red beds and sands.

**The Bone Spring Lime pick is consistent with my own geological picks and with reported tops of the Bone Spring formation. We just have a very thick section of slope carbonates of Bone Spring time here.

**Pressure Control**

A 13-5/8" 5M BOP and 5M choke manifold will be used. See attached schematics.
BOP test shall be conducted:

A. when initially installed
B. whenever any seal subject to test pressure is broken
C. following related repairs
D. at 30 day intervals

The BOP, choke, kill lines, Kelly cock, inside BOP, etc will be tested after nipple up on the 13⅜" Casing. The Pipe Rams, Blind Rams and Annular will be tested after running the 9⅝" casing. The kill lines and choke manifold will not be tested after the 9⅝" casing. The Pipe Rams, Blind Rams and Annular will be tested after running the 7" casing. The kill lines and choke manifold will not be tested after the 7" casing.

BOP, choke, kill lines, Kelly cock, inside BOP, etc. will be hydro tested to 5,000psi(high) and 250psi(low). The annular will be tested to 2500psi (high) and 250psi (low).

BOP will be function tested on each trip.

**Casing Program (minimum):**

***All casing is new API casing.***

| HOLE | CASING | WEIGHT | GRADE | CONN | MD/RKB | STAGE |
|---|---|---|---|---|---|---|
| | 20" | Structural | LP | N/A | 0' – 115' | Conductor |
| 16" | 13⅜" | 54.5 ppf | J-55 | ST&C | 0' – 290' 280' | Surface |
| 12¼" | 9⅝" | 36.0 ppf | J-55 | LT&C | 0' – 2895' | Intermediate |
| 8¾" | 7" | 26.0 ppf | P-110 | BT&C | 0' – 7583' | Production |
| 6⅛" | 4½" | 11.6 ppf | P-110 | BT&C | 7433' – 12250' 12215' | Completion |

| SIZE | COLLAPSE | SF | BURST | SF | TENSION(Klbs) | SF |
|---|---|---|---|---|---|---|
| 13⅜" | 1130 | 9.27 | 2730 | 5.73 | 514 | 33.9 |
| 9⅝" | 2020 | 1.35 | 3520 | 2.53 | 453 | 4.36 |
| 7" | 6210 | 1.74 | 9950 | 2.56 | 693 | 3.5 |
| 4½" | 7580 | 2.09 | 10690 | 2.14 | 385 | 2.7 |

**Cement Program:**

**13.375" Surface Casing**

Cement with 450sx - 14.8ppg – 1.35cuft/sk – 6.33gal/sk - Class C (Is an API cement intended for surface to a depth of 6000'. It is sulfate resistant and yields early compressive strengths.) C (+ 2% CACL2 (An accelerating additive used for slurries that require fast set times and early compressive strength) + 0.25# Cello-flake (Used as an LCM) + 0.25% R-38 (Is a powdered defoamer for all types of oil well cement.)

Cement with 100% excess – Circulate cement to surface. If cement does not circulate a 1" grout string will be used to perform a top job. (not possible clearance 0.8125")

**9.625" Intermediate Casing**

Cement with 550sx Lead – 12.8ppg – 1.92cuft/sk – 10.06gal/sk – Class C 35/65 (Is an API cement intended for surface to a depth of 6000'. It is sulfate resistant and yields early compressive strengths.) + 6% Bentonite + 0.3% C-16A (Is a non-retarding fluid loss additive with particular application in pozzolan slurries. It is highly effective at exceptionally low loadings (0.5% or below) in many slurry designs.) + 2# Star Seal (Is a loss circulation additive for severe loss circulation problems. It increases cement height and the ability to circulate cement through sloughed out formations. Typical loadings are 2#/sk to 5#/sk.) + 1% CACL2 (Is an accelerating additive used for slurries that require fast set times and early strength development) + 0.25% R-38 (Is a powdered defoamer for all types of oil well cement. Typical loadings are 0.25% to 0.5% BWOC.)+ 5% Salt (Salt is a multi purpose additive used as an accelerator from 1% to 6% BWOW, a bonding agent from 6% to 14%, a retarder from 14% to 26% BWOW. )

Cement with 225sx Tail – 14.8ppg – 1.33cuft/sk – 6.31 gal/sk – Class C (Is an API cement intended for surface to a depth of 6000'. It is sulfate resistant and yields early compressive strengths.) + 0.25% R-38 (Is a powdered defoamer for all types of oil well cement.)

Cement with 55% excess – Circulate cement to surface. If cement does not circulate a top squeeze job will be performed.

**7" Production Casing**

Cement with 625sx Lead – 11.9ppg – 2.38cuft/sk – 13.41gal/sk – Class H 50/50 (Is an API cement intended for use from surface to 8000 feet without any modifications. When used with accelerators or retarders class H can be used for different depths or temperatures.) + 10% Bentonite + .03% C-16A (Is a non-retarding fluid loss additive with particular application in pozzolan slurries. It is highly effective at exceptionally low loadings (0.5% or below) in many slurry designs.)+ 2# Star Seal (Is a loss circulation additive for severe loss circulation problems. It increases cement height and the ability to circulate cement through sloughed out formations. Typical loadings are 2#/sk to 5#/sk.) + 0.25% R-38 (Is a powdered defoamer for all types of oil well cement. Typical loadings are 0.25% to 0.5% BWOC.)+ 5% Salt

Cement with 225sx Tail – 15.6ppg – 1.18cuft/sk – 5.22 gal/sk – Class H (Is an API cement intended for use from surface to 8000 feet without any modifications. When used with accelerators or retarders class H can be used for different depths or temperatures.)+ 0.25% R-38 (Is a powdered defoamer for all types of oil well cement. Typical loadings are 0.25% to 0.5% BWOC.)

Cement with 55% excess – Circulate cement to surface. If cement does not circulate then a top squeeze job will be performed or perforate and squeeze. This will be discussed with the BLM at the time.

**4.5" Completion System**
This will not be cemented. A hanger and packer will be set 150' inside the 7" casing. The completions will be a packer and sliding sleeve system(Baker Hughes Frac Point).

**Mud Program:**

| Depth (MD) | Hole Size | MW | PV | YP | WL | pH | Sol% |
|---|---|---|---|---|---|---|---|
| Spud with fresh water gel (36-40 visc) in suction pit. | | | | | | | |
| 0'-290' / 280' | 16" | 8.3-9.0 | 10-12 | 12-15 | N/C | 10-10.5 | <3 |
| Brine / 280' to 290' | | | | | | | |
| 290'-2895' | 12¼" | 10 | 1-2 | 1-2 | N/C | 10-10.5 | <1 |
| Cut Brine | | | | | | | |
| 2902'-7050' | 8¾" | 8.4-8.6 | 1 | 1 | N/C | 10-10.5 | <1 |
| Cut Brine | | | | | | | |
| 7050'-7583' | 8¾" | 9.0-9.1 | 4-6 | 4-6 | 18-20 | 10-10.5 | <3 |
| Cut Brine | | | | | | | |
| 7583'-8346' | 6⅛" | 9.0-9.1 | 4-6 | 4-6 | 18-20 | 9.5-10.0 | <3 |
| Cut Brine | | | | | | | |
| 8346'-12216' | 6⅛" | 9.0-9.1 | 10-12 | 18-20 | 12-15 | 9.5-10.0 | <4 |

**Logging, Drill stem testing and Coring:**
2 man mud logging will start after surface casing has been set.

8.75" hole will have LWD (Gamma Ray). Logging will commence at KOP to section TD.

6.125" hole will have LWD (Gamma Ray). Logging will be for the whole 6.125" section.

No cores or DST's are planned for the well.

**Bottom Hole:**
Temperature is expected to be 126°F. The bottom hole pressure is expected to be 3375psi maximum.

**Abnormal Conditions:**
No abnormal conditions are expected. Temperature is expected to be normal. All zones are expected to be normal pressure. No lost circulation is expected.

See COA

**H2S:**
No H2S is expected, but there is the possibility of the presence of H2S. Safety equipment will be in place prior to drilling out the surface shoe. Attached is the H2S response plan.

**Directional:**
Directional survey plan and plot attached.

**DRILLING RECORDER:**
Rig up EDR & PVT prior to spud to record drilling times and other drilling parameters from surface to TD.

**MUD MONITORING SYSTEM**
A pason PVT system will be rigged up prior to spudding the well. A volume monitoring system that measures, calculates, and displays readings from the mud system on the rig to alert the rig crew of impending gas kicks and lost circulation issues.

**Components**

**PVT Pit Bull monitor:**
Acts as the heart of the system, containing all the controls, switches, and alarms. Typically, it is mounted near the driller's console.

**Junction box:**
Provides a safe, convenient place for making the wiring connections.

**Mud probes:**
Measure the volume of drilling fluid in each individual tank.

**Flow sensor:**
Measures the relative amount of mud flowing in the return line.

# *New Mexico Office of the State Engineer*

# Active & Inactive Points of Diversion

**(with Ownership Information)**

No PODs found.

**POD Search:**

**POD Basin:** Capitan

**Basin/County Search:**

**Basin:** Capitan **County:** Eddy

**PLSS Search:**

**Section(s):** 21 **Township:** 18S **Range:** 29E

MURCHISON OIL & GAS, INC.

# Murchison Oil and Gas

**Mustang**
**Mustang Section 21**
**War Horse Federal Com #3H**
**War Horse Fed Com #3H**

**Plan: 121001 War Horse Federal Com 3H**

# MOJO Standard Well Plan

**17 October, 2012**

MOJO
DIRECTIONAL CORPORATION

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Well: | War Horse Federal Com #3H | North Reference: | Grid |
| Wellbore: | War Horse Fed Com #3H | Survey Calculation Method: | Minimum Curvature |
| Design: | 121001 War Horse Federal Com 3H | Database: | EDM 5000.1 Single User Db |

**Project** Mustang

| | | | |
|---|---|---|---|
| Map System: | US State Plane 1983 | System Datum: | Mean Sea Level |
| Geo Datum: | North American Datum 1983 | | |
| Map Zone: | New Mexico Eastern Zone | | Using geodetic scale factor |

**Site** Mustang Section 21

| | | | | | |
|---|---|---|---|---|---|
| Site Position: | | Northing: | 632,777.80 usft | Latitude: | 32° 44' 21.376 N |
| From: | Lat/Long | Easting: | 621,766.69 usft | Longitude: | 104° 4' 18.315 W |
| Position Uncertainty: | 1.0 usft | Slot Radius: | 16 " | Grid Convergence: | 0.14 ° |

**Well** War Horse Federal Com #3H

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Well Position | +N/-S | 0.0 usft | Northing: | 629,736.95 usft | Latitude: | 32° 43' 51.288 N |
| | +E/-W | 0.0 usft | Easting: | 621,698.78 usft | Longitude: | 104° 4' 19.198 W |
| Position Uncertainty | | 0.0 usft | Wellhead Elevation: | usft | Ground Level: | 3,477.2 usft |

**Wellbore** War Horse Fed Com #3H

| Magnetics | Model Name | Sample Date | Declination (°) | Dip Angle (°) | Field Strength (nT) |
|---|---|---|---|---|---|
| | IGRF2010 | 01/10/2012 | 7.70 | 60.54 | 48,736 |

**Design** 121001 War Horse Federal Com 3H

Audit Notes:

| | | | | | |
|---|---|---|---|---|---|
| Version: | | Phase: | PLAN | Tie On Depth: | 0.0 |

| Vertical Section: | Depth From (TVD) (usft) | +N/-S (usft) | +E/-W (usft) | Direction (°) |
|---|---|---|---|---|
| | 0.0 | 0.0 | 0.0 | 270.91 |

**Survey Tool Program** Date 17/10/2012

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.0 | 12,215.1 | 121001 War Horse Federal Com 3H (War | MWD | MWD - Standard |

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Well: | War Horse Federal Com #3H | North Reference: | Grid |
| Wellbore: | War Horse Fed Com #3H | Survey Calculation Method: | Minimum Curvature |
| Design: | 121001 War Horse Federal Com 3H | Database: | EDM 5000.1 Single User Db |

Planned Survey

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | V. Sec (usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.00 | 0.00 | 0.0 | -3,495.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 100.0 | 0.00 | 0.00 | 100.0 | -3,395.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 115.0 | 0.00 | 0.00 | 115.0 | -3,380.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **20" Conductor** | | | | | | | | | | |
| 200.0 | 0.00 | 0.00 | 200.0 | -3,295.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 290.0 | 0.00 | 0.00 | 290.0 | -3,205.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **13 3/8"** | | | | | | | | | | |
| 295.2 | 0.00 | 0.00 | 295.2 | -3,200.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **Salt** | | | | | | | | | | |
| 300.0 | 0.00 | 0.00 | 300.0 | -3,195.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 400.0 | 0.00 | 0.00 | 400.0 | -3,095.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 500.0 | 0.00 | 0.00 | 500.0 | -2,995.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 600.0 | 0.00 | 0.00 | 600.0 | -2,895.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 700.0 | 0.00 | 0.00 | 700.0 | -2,795.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 800.0 | 0.00 | 0.00 | 800.0 | -2,695.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 825.2 | 0.00 | 0.00 | 825.2 | -2,670.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **Salt Base** | | | | | | | | | | |
| 900.0 | 0.00 | 0.00 | 900.0 | -2,595.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 915.2 | 0.00 | 0.00 | 915.2 | -2,580.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **Tansil** | | | | | | | | | | |
| 1,000.0 | 0.00 | 0.00 | 1,000.0 | -2,495.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 1,100.0 | 0.00 | 0.00 | 1,100.0 | -2,395.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 1,125.2 | 0.00 | 0.00 | 1,125.2 | -2,370.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **Yates** | | | | | | | | | | |
| 1,200.0 | 0.00 | 0.00 | 1,200.0 | -2,295.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 1,300.0 | 0.00 | 0.00 | 1,300.0 | -2,195.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 1,400.0 | 0.00 | 0.00 | 1,400.0 | -2,095.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Well: | War Horse Federal Com #3H | North Reference: | Grid |
| Wellbore: | War Horse Fed Com #3H | Survey Calculation Method: | Minimum Curvature |
| Design: | 121001 War Horse Federal Com 3H | Database: | EDM 5000.1 Single User Db |

Planned Survey

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | V. Sec (usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 1,425.2 | 0.00 | 0.00 | 1,425.2 | -2,070.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **Seven Rivers** | | | | | | | | | | |
| 1,500.0 | 0.00 | 0.00 | 1,500.0 | -1,995.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 1,600.0 | 0.00 | 0.00 | 1,600.0 | -1,895.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 1,700.0 | 0.00 | 0.00 | 1,700.0 | -1,795.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 1,800.0 | 0.00 | 0.00 | 1,800.0 | -1,695.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 1,900.0 | 0.00 | 0.00 | 1,900.0 | -1,595.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 2,000.0 | 0.00 | 0.00 | 2,000.0 | -1,495.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 2,050.2 | 0.00 | 0.00 | 2,050.2 | -1,445.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **Queen** | | | | | | | | | | |
| 2,100.0 | 0.00 | 0.00 | 2,100.0 | -1,395.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 2,200.0 | 0.00 | 0.00 | 2,200.0 | -1,295.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 2,300.0 | 0.00 | 0.00 | 2,300.0 | -1,195.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 2,395.2 | 0.00 | 0.00 | 2,395.2 | -1,100.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **Grayburg** | | | | | | | | | | |
| 2,400.0 | 0.00 | 0.00 | 2,400.0 | -1,095.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 2,500.0 | 0.00 | 0.00 | 2,500.0 | -995.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 2,600.0 | 0.00 | 0.00 | 2,600.0 | -895.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 2,700.0 | 0.00 | 0.00 | 2,700.0 | -795.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 2,800.0 | 0.00 | 0.00 | 2,800.0 | -695.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 2,895.2 | 0.00 | 0.00 | 2,895.2 | -600.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **San Andres - 9 5/8"** | | | | | | | | | | |
| 2,900.0 | 0.00 | 0.00 | 2,900.0 | -595.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 3,000.0 | 0.00 | 0.00 | 3,000.0 | -495.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 3,100.0 | 0.00 | 0.00 | 3,100.0 | -395.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 3,200.0 | 0.00 | 0.00 | 3,200.0 | -295.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 3,300.0 | 0.00 | 0.00 | 3,300.0 | -195.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 3,400.0 | 0.00 | 0.00 | 3,400.0 | -95.2 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Well: | War Horse Federal Com #3H | North Reference: | Grid |
| Wellbore: | War Horse Fed Com #3H | Survey Calculation Method: | Minimum Curvature |
| Design: | 121001 War Horse Federal Com 3H | Database: | EDM 5000.1 Single User Db |

Planned Survey

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | V. Sec (usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 3,500.0 | 0.00 | 0.00 | 3,500.0 | 4.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 3,600.0 | 0.00 | 0.00 | 3,600.0 | 104.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 3,700.0 | 0.00 | 0.00 | 3,700.0 | 204.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 3,800.0 | 0.00 | 0.00 | 3,800.0 | 304.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 3,900.0 | 0.00 | 0.00 | 3,900.0 | 404.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 3,960.2 | 0.00 | 0.00 | 3,960.2 | 465.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **Bone Spring Lime** | | | | | | | | | | |
| 4,000.0 | 0.00 | 0.00 | 4,000.0 | 504.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 4,100.0 | 0.00 | 0.00 | 4,100.0 | 604.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 4,200.0 | 0.00 | 0.00 | 4,200.0 | 704.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 4,300.0 | 0.00 | 0.00 | 4,300.0 | 804.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 4,400.0 | 0.00 | 0.00 | 4,400.0 | 904.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 4,500.0 | 0.00 | 0.00 | 4,500.0 | 1,004.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 4,600.0 | 0.00 | 0.00 | 4,600.0 | 1,104.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 4,700.0 | 0.00 | 0.00 | 4,700.0 | 1,204.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 4,800.0 | 0.00 | 0.00 | 4,800.0 | 1,304.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 4,900.0 | 0.00 | 0.00 | 4,900.0 | 1,404.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 5,000.0 | 0.00 | 0.00 | 5,000.0 | 1,504.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 5,100.0 | 0.00 | 0.00 | 5,100.0 | 1,604.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 5,200.0 | 0.00 | 0.00 | 5,200.0 | 1,704.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 5,300.0 | 0.00 | 0.00 | 5,300.0 | 1,804.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 5,400.0 | 0.00 | 0.00 | 5,400.0 | 1,904.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 5,500.0 | 0.00 | 0.00 | 5,500.0 | 2,004.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 5,600.0 | 0.00 | 0.00 | 5,600.0 | 2,104.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 5,700.0 | 0.00 | 0.00 | 5,700.0 | 2,204.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 5,800.0 | 0.00 | 0.00 | 5,800.0 | 2,304.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 5,900.0 | 0.00 | 0.00 | 5,900.0 | 2,404.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Well: | War Horse Federal Com #3H | North Reference: | Grid |
| Wellbore: | War Horse Fed Com #3H | Survey Calculation Method: | Minimum Curvature |
| Design: | 121001 War Horse Federal Com 3H | Database: | EDM 5000.1 Single User Db |

Planned Survey

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | V. Sec (usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 6,000.0 | 0.00 | 0.00 | 6,000.0 | 2,504.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 6,100.0 | 0.00 | 0.00 | 6,100.0 | 2,604.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 6,200.0 | 0.00 | 0.00 | 6,200.0 | 2,704.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 6,300.0 | 0.00 | 0.00 | 6,300.0 | 2,804.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 6,400.0 | 0.00 | 0.00 | 6,400.0 | 2,904.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 6,500.0 | 0.00 | 0.00 | 6,500.0 | 3,004.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 6,600.0 | 0.00 | 0.00 | 6,600.0 | 3,104.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 6,675.2 | 0.00 | 0.00 | 6,675.2 | 3,180.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **First Bone Spring Sand** | | | | | | | | | | |
| 6,700.0 | 0.00 | 0.00 | 6,700.0 | 3,204.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 6,800.0 | 0.00 | 0.00 | 6,800.0 | 3,304.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **Start 353.2 hold at 6800.0 MD** | | | | | | | | | | |
| 6,900.0 | 0.00 | 0.00 | 6,900.0 | 3,404.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 7,000.0 | 0.00 | 0.00 | 7,000.0 | 3,504.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 7,100.0 | 0.00 | 0.00 | 7,100.0 | 3,604.8 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| 7,153.2 | 0.00 | 0.00 | 7,153.2 | 3,658.0 | 0.0 | 0.0 | 0.00 | 0.0 | 629,736.95 | 621,698.78 |
| **Start Build 9.00** | | | | | | | | | | |
| 7,200.0 | 4.21 | 270.00 | 7,200.0 | 3,704.8 | 0.0 | -1.7 | 9.00 | 1.7 | 629,736.95 | 621,697.06 |
| 7,250.0 | 8.71 | 270.00 | 7,249.6 | 3,754.4 | 0.0 | -7.3 | 9.00 | 7.3 | 629,736.95 | 621,691.43 |
| 7,300.0 | 13.21 | 270.00 | 7,298.7 | 3,803.5 | 0.0 | -16.9 | 9.00 | 16.8 | 629,736.95 | 621,681.92 |
| 7,350.0 | 17.71 | 270.00 | 7,346.9 | 3,851.7 | 0.0 | -30.2 | 9.00 | 30.2 | 629,736.95 | 621,668.60 |
| 7,400.0 | 22.21 | 270.00 | 7,393.9 | 3,898.7 | 0.0 | -47.2 | 9.00 | 47.2 | 629,736.95 | 621,651.53 |
| 7,450.0 | 26.71 | 270.00 | 7,439.4 | 3,944.2 | 0.0 | -67.9 | 9.00 | 67.9 | 629,736.95 | 621,630.84 |
| 7,500.0 | 31.21 | 270.00 | 7,483.1 | 3,987.9 | 0.0 | -92.2 | 9.00 | 92.1 | 629,736.95 | 621,606.63 |
| 7,525.0 | 33.46 | 270.00 | 7,504.2 | 4,009.0 | 0.0 | -105.5 | 9.00 | 105.5 | 629,736.95 | 621,593.26 |
| **7"** | | | | | | | | | | |
| 7,550.5 | 35.76 | 270.00 | 7,525.2 | 4,030.0 | 0.0 | -120.0 | 9.00 | 120.0 | 629,736.95 | 621,578.79 |
| **Start DLS 9.02 TFO 0.00 - Second Bone Spring Sand** | | | | | | | | | | |

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Well: | War Horse Federal Com #3H | North Reference: | Grid |
| Wellbore: | War Horse Fed Com #3H | Survey Calculation Method: | Minimum Curvature |
| Design: | 121001 War Horse Federal Com 3H | Database: | EDM 5000.1 Single User Db |

Planned Survey

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | V. Sec (usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 7,600.0 | 40.22 | 270.00 | 7,564.2 | 4,069.0 | 0.0 | -150.5 | 9.02 | 150.4 | 629,736.95 | 621,548.32 |
| 7,648.5 | 44.60 | 270.00 | 7,600.0 | 4,104.8 | 0.0 | -183.2 | 9.02 | 183.1 | 629,736.95 | 621,515.63 |
| **Start Build 9.11** | | | | | | | | | | |
| 7,650.0 | 44.74 | 270.00 | 7,601.1 | 4,105.9 | 0.0 | -184.2 | 9.11 | 184.2 | 629,736.95 | 621,514.57 |
| 7,700.0 | 49.29 | 270.00 | 7,635.2 | 4,140.0 | 0.0 | -220.8 | 9.11 | 220.8 | 629,736.95 | 621,478.00 |
| 7,750.0 | 53.85 | 270.00 | 7,666.2 | 4,171.0 | 0.0 | -259.9 | 9.11 | 259.9 | 629,736.95 | 621,438.85 |
| 7,800.0 | 58.40 | 270.00 | 7,694.1 | 4,198.9 | 0.0 | -301.4 | 9.11 | 301.4 | 629,736.95 | 621,397.35 |
| 7,850.0 | 62.95 | 270.00 | 7,718.6 | 4,223.4 | 0.0 | -345.0 | 9.11 | 345.0 | 629,736.95 | 621,353.77 |
| 7,900.0 | 67.51 | 270.00 | 7,739.5 | 4,244.3 | 0.0 | -390.4 | 9.11 | 390.4 | 629,736.95 | 621,308.39 |
| 7,950.0 | 72.06 | 270.00 | 7,756.8 | 4,261.6 | 0.0 | -437.3 | 9.11 | 437.3 | 629,736.95 | 621,261.48 |
| 8,000.0 | 76.62 | 270.00 | 7,770.3 | 4,275.1 | 0.0 | -485.5 | 9.11 | 485.4 | 629,736.95 | 621,213.36 |
| 8,050.0 | 81.17 | 270.00 | 7,779.9 | 4,284.7 | 0.0 | -534.5 | 9.11 | 534.4 | 629,736.95 | 621,164.31 |
| 8,100.0 | 85.73 | 270.00 | 7,785.6 | 4,290.4 | 0.0 | -584.2 | 9.11 | 584.1 | 629,736.95 | 621,114.65 |
| 8,150.0 | 90.28 | 270.00 | 7,787.3 | 4,292.1 | 0.0 | -634.1 | 9.11 | 634.0 | 629,736.95 | 621,064.70 |
| 8,160.9 | 91.27 | 270.00 | 7,787.2 | 4,292.0 | 0.0 | -645.0 | 9.11 | 644.9 | 629,736.95 | 621,053.84 |
| **Start DLS 0.16 TFO 89.88** | | | | | | | | | | |
| 8,200.0 | 91.27 | 270.06 | 7,786.3 | 4,291.1 | 0.0 | -684.1 | 0.16 | 684.0 | 629,736.98 | 621,014.71 |
| 8,300.0 | 91.27 | 270.23 | 7,784.1 | 4,288.9 | 0.3 | -784.1 | 0.16 | 784.0 | 629,737.23 | 620,914.75 |
| 8,400.0 | 91.27 | 270.39 | 7,781.9 | 4,286.7 | 0.8 | -884.1 | 0.16 | 884.0 | 629,737.76 | 620,814.78 |
| 8,500.0 | 91.27 | 270.55 | 7,779.7 | 4,284.5 | 1.6 | -984.0 | 0.16 | 983.9 | 629,738.58 | 620,714.82 |
| 8,600.0 | 91.27 | 270.71 | 7,777.5 | 4,282.3 | 2.7 | -1,084.0 | 0.16 | 1,083.9 | 629,739.68 | 620,614.86 |
| 8,700.0 | 91.27 | 270.87 | 7,775.2 | 4,280.0 | 4.1 | -1,184.0 | 0.16 | 1,183.9 | 629,741.07 | 620,514.90 |
| 8,800.0 | 91.27 | 271.04 | 7,773.0 | 4,277.8 | 5.8 | -1,283.9 | 0.16 | 1,283.9 | 629,742.73 | 620,414.95 |
| 8,900.0 | 91.27 | 271.20 | 7,770.8 | 4,275.6 | 7.7 | -1,383.9 | 0.16 | 1,383.8 | 629,744.68 | 620,315.00 |
| 8,973.6 | 91.27 | 271.32 | 7,769.2 | 4,274.0 | 9.3 | -1,457.5 | 0.16 | 1,457.4 | 629,746.30 | 620,241.44 |
| **Start 2428.8 hold at 8973.6 MD** | | | | | | | | | | |
| 9,000.0 | 91.27 | 271.32 | 7,768.6 | 4,273.4 | 10.0 | -1,483.8 | 0.00 | 1,483.8 | 629,746.91 | 620,215.06 |

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Well: | War Horse Federal Com #3H | North Reference: | Grid |
| Wellbore: | War Horse Fed Com #3H | Survey Calculation Method: | Minimum Curvature |
| Design: | 121001 War Horse Federal Com 3H | Database: | EDM 5000.1 Single User Db |

Planned Survey

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | V. Sec (usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 9,100.0 | 91.27 | 271.32 | 7,766.4 | 4,271.2 | 12.3 | -1,583.8 | 0.00 | 1,583.8 | 629,749.21 | 620,115.12 |
| 9,200.0 | 91.27 | 271.32 | 7,764.1 | 4,268.9 | 14.6 | -1,683.7 | 0.00 | 1,683.8 | 629,751.51 | 620,015.18 |
| 9,300.0 | 91.27 | 271.32 | 7,761.9 | 4,266.7 | 16.9 | -1,783.7 | 0.00 | 1,783.7 | 629,753.81 | 619,915.24 |
| 9,400.0 | 91.27 | 271.32 | 7,759.7 | 4,264.5 | 19.2 | -1,883.6 | 0.00 | 1,883.7 | 629,756.11 | 619,815.30 |
| 9,500.0 | 91.27 | 271.32 | 7,757.5 | 4,262.3 | 21.5 | -1,983.6 | 0.00 | 1,983.7 | 629,758.41 | 619,715.35 |
| 9,600.0 | 91.27 | 271.32 | 7,755.3 | 4,260.1 | 23.8 | -2,083.5 | 0.00 | 2,083.6 | 629,760.71 | 619,615.41 |
| 9,700.0 | 91.27 | 271.32 | 7,753.0 | 4,257.8 | 26.1 | -2,183.5 | 0.00 | 2,183.6 | 629,763.01 | 619,515.47 |
| 9,800.0 | 91.27 | 271.32 | 7,750.8 | 4,255.6 | 28.4 | -2,283.4 | 0.00 | 2,283.6 | 629,765.31 | 619,415.53 |
| 9,900.0 | 91.27 | 271.32 | 7,748.6 | 4,253.4 | 30.7 | -2,383.4 | 0.00 | 2,383.6 | 629,767.61 | 619,315.59 |
| 10,000.0 | 91.27 | 271.32 | 7,746.4 | 4,251.2 | 33.0 | -2,483.3 | 0.00 | 2,483.5 | 629,769.91 | 619,215.65 |
| 10,100.0 | 91.27 | 271.32 | 7,744.2 | 4,249.0 | 35.3 | -2,583.3 | 0.00 | 2,583.5 | 629,772.21 | 619,115.71 |
| 10,200.0 | 91.27 | 271.32 | 7,741.9 | 4,246.7 | 37.6 | -2,683.2 | 0.00 | 2,683.5 | 629,774.51 | 619,015.77 |
| 10,300.0 | 91.27 | 271.32 | 7,739.7 | 4,244.5 | 39.9 | -2,783.2 | 0.00 | 2,783.5 | 629,776.81 | 618,915.83 |
| 10,400.0 | 91.27 | 271.32 | 7,737.5 | 4,242.3 | 42.2 | -2,883.1 | 0.00 | 2,883.4 | 629,779.11 | 618,815.89 |
| 10,500.0 | 91.27 | 271.32 | 7,735.3 | 4,240.1 | 44.5 | -2,983.1 | 0.00 | 2,983.4 | 629,781.41 | 618,715.95 |
| 10,600.0 | 91.27 | 271.32 | 7,733.1 | 4,237.9 | 46.8 | -3,083.0 | 0.00 | 3,083.4 | 629,783.71 | 618,616.01 |
| 10,700.0 | 91.27 | 271.32 | 7,730.8 | 4,235.6 | 49.1 | -3,183.0 | 0.00 | 3,183.4 | 629,786.01 | 618,516.07 |
| 10,800.0 | 91.27 | 271.32 | 7,728.6 | 4,233.4 | 51.4 | -3,282.9 | 0.00 | 3,283.3 | 629,788.31 | 618,416.13 |
| 10,900.0 | 91.27 | 271.32 | 7,726.4 | 4,231.2 | 53.7 | -3,382.9 | 0.00 | 3,383.3 | 629,790.61 | 618,316.19 |
| 11,000.0 | 91.27 | 271.32 | 7,724.2 | 4,229.0 | 56.0 | -3,482.8 | 0.00 | 3,483.3 | 629,792.91 | 618,216.25 |
| 11,100.0 | 91.27 | 271.32 | 7,721.9 | 4,226.7 | 58.3 | -3,582.8 | 0.00 | 3,583.2 | 629,795.21 | 618,116.31 |
| 11,200.0 | 91.27 | 271.32 | 7,719.7 | 4,224.5 | 60.6 | -3,682.7 | 0.00 | 3,683.2 | 629,797.51 | 618,016.37 |
| 11,300.0 | 91.27 | 271.32 | 7,717.5 | 4,222.3 | 62.9 | -3,782.7 | 0.00 | 3,783.2 | 629,799.81 | 617,916.43 |
| 11,402.4 | 91.27 | 271.32 | 7,715.2 | 4,220.0 | 65.2 | -3,885.0 | 0.00 | 3,885.6 | 629,802.16 | 617,814.09 |
| **Start DLS 0.16 TFO -90.09** | | | | | | | | | | |
| 11,500.0 | 91.27 | 271.16 | 7,713.1 | 4,217.9 | 67.3 | -3,982.6 | 0.16 | 3,983.1 | 629,804.27 | 617,716.54 |
| 11,600.0 | 91.27 | 271.00 | 7,710.8 | 4,215.6 | 69.2 | -4,082.5 | 0.16 | 4,083.1 | 629,806.15 | 617,616.59 |

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Well: | War Horse Federal Com #3H | North Reference: | Grid |
| Wellbore: | War Horse Fed Com #3H | Survey Calculation Method: | Minimum Curvature |
| Design: | 121001 War Horse Federal Com 3H | Database: | EDM 5000.1 Single User Db |

Planned Survey

| MD (usft) | Inc (°) | Azi (azimuth) (°) | TVD (usft) | TVDSS (usft) | N/S (usft) | E/W (usft) | DLeg (°/100usft) | V. Sec (usft) | Northing (usft) | Easting (usft) |
|---|---|---|---|---|---|---|---|---|---|---|
| 11,700.0 | 91.27 | 270.84 | 7,708.6 | 4,213.4 | 70.8 | -4,182.5 | 0.16 | 4,183.1 | 629,807.75 | 617,516.64 |
| 11,800.0 | 91.27 | 270.67 | 7,706.4 | 4,211.2 | 72.1 | -4,282.5 | 0.16 | 4,283.1 | 629,809.07 | 617,416.68 |
| 11,900.0 | 91.27 | 270.51 | 7,704.2 | 4,209.0 | 73.2 | -4,382.4 | 0.16 | 4,383.0 | 629,810.10 | 617,316.72 |
| 12,000.0 | 91.27 | 270.35 | 7,702.0 | 4,206.8 | 73.9 | -4,482.4 | 0.16 | 4,483.0 | 629,810.85 | 617,216.75 |
| 12,100.0 | 91.27 | 270.19 | 7,699.8 | 4,204.6 | 74.4 | -4,582.4 | 0.16 | 4,583.0 | 629,811.32 | 617,116.79 |
| 12,200.0 | 91.27 | 270.02 | 7,697.5 | 4,202.3 | 74.6 | -4,682.3 | 0.16 | 4,682.9 | 629,811.50 | 617,016.82 |
| 12,215.1 | 91.27 | 270.00 | 7,697.2 | 4,202.0 | 74.6 | -4,697.5 | 0.16 | 4,698.1 | 629,811.51 | 617,001.69 |
| TD at 12215.1 | | | | | | | | | | |

Casing Points

| Measured Depth (usft) | Vertical Depth (usft) | Name | Casing Diameter (") | Hole Diameter (") |
|---|---|---|---|---|
| 7,525.0 | 7,504.2 | 7" | 7 | 7 |
| 290.0 | 290.0 | 13 3/8" | 13-3/8 | 16 |
| 115.0 | 115.0 | 20" Conductor | 20 | 21 |
| 2,895.2 | 2,895.2 | 9 5/8" | 9-5/8 | 12-1/4 |

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Well: | War Horse Federal Com #3H | North Reference: | Grid |
| Wellbore: | War Horse Fed Com #3H | Survey Calculation Method: | Minimum Curvature |
| Design: | 121001 War Horse Federal Com 3H | Database: | EDM 5000.1 Single User Db |

Formations

| Measured Depth (usft) | Vertical Depth (usft) | Name | Lithology | Dip (°) | Dip Direction (°) |
|---|---|---|---|---|---|
| 7,550.5 | 7,525.2 | Second Bone Spring Sand | | 0.00 | |
| 1,425.2 | 1,425.2 | Seven Rivers | | 0.00 | |
| 2,050.2 | 2,050.2 | Queen | | 0.00 | |
| 2,395.2 | 2,395.2 | Grayburg | | 0.00 | |
| 295.2 | 295.2 | Salt | | 0.00 | |
| 915.2 | 915.2 | Tansil | | 0.00 | |
| 6,675.2 | 6,675.2 | First Bone Spring Sand | | 0.00 | |
| 825.2 | 825.2 | Salt Base | | 0.00 | |
| 1,125.2 | 1,125.2 | Yates | | 0.00 | |
| 2,895.2 | 2,895.2 | San Andres | | 0.00 | |
| 3,960.2 | 3,960.2 | Bone Spring Lime | | 0.00 | |

Plan Annotations

| Measured Depth (usft) | Vertical Depth (usft) | Local Coordinates +N/-S (usft) | Local Coordinates +E/-W (usft) | Comment |
|---|---|---|---|---|
| 6,800.0 | 6,800.0 | 0.0 | 0.0 | Start 353.2 hold at 6800.0 MD |
| 7,153.2 | 7,153.2 | 0.0 | 0.0 | Start Build 9.00 |
| 7,550.5 | 7,525.2 | 0.0 | -120.0 | Start DLS 9.02 TFO 0.00 |
| 7,648.5 | 7,600.0 | 0.0 | -183.2 | Start Build 9.11 |
| 8,160.9 | 7,787.2 | 0.0 | -645.0 | Start DLS 0.16 TFO 89.88 |
| 8,973.6 | 7,769.2 | 9.3 | -1,457.5 | Start 2428.8 hold at 8973.6 MD |
| 11,402.4 | 7,715.2 | 65.2 | -3,885.0 | Start DLS 0.16 TFO -90.09 |
| 12,215.1 | 7,697.2 | 74.6 | -4,697.5 | TD at 12215.1 |

Checked By: _____ Approved By: _____ Date: _____

MURCHISON OIL & GAS, INC.

Project: Mustang
Site: Mustang Section 21
Well: War Horse Federal Com #3H
Wellbore: War Horse Fed Com #3H
Design: 121001 War Horse Federal Com 3H

COMPANY DETAILS: Murchison Oil and Gas

Drilling
Calculation Method: Minimum Curvature
Error System: ISCWSA
Scan Method: Closest Approach 3D
Error Surface: Elliptical Conic
Warning Method: Error Ratio

MOJO DIRECTIONAL DRILLING

## CASING DETAILS

| TVD | MD | Name | Size |
|---|---|---|---|
| 115.0 | 115.0 | 20" Conductor | 20 |
| 290.0 | 290.0 | 13 3/8" | 13-3/8 |
| 2895.2 | 2895.2 | 9 5/8" | 9-5/8 |
| 7504.2 | 7525.0 | 7" | 7 |

## REFERENCE INFORMATION

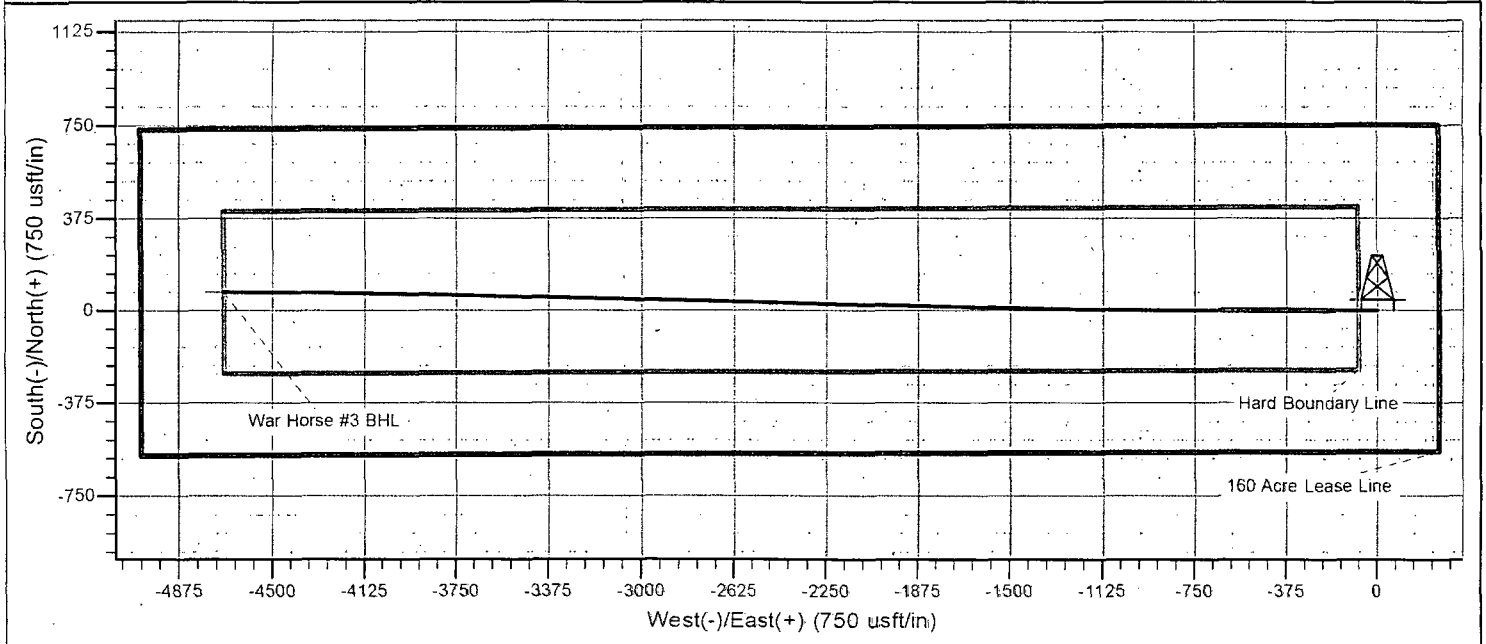
Co-ordinate (N/E) Reference: Well War Horse Federal Com #3H, Grid North
Vertical (TVD) Reference: WELL @ 3495.2usft (Original Well Elev)
Section (VS) Reference: Slot - (0.0N, 0.0E)
Measured Depth Reference: WELL @ 3495.2usft (Original Well Elev)
Calculation Method: Minimum Curvature

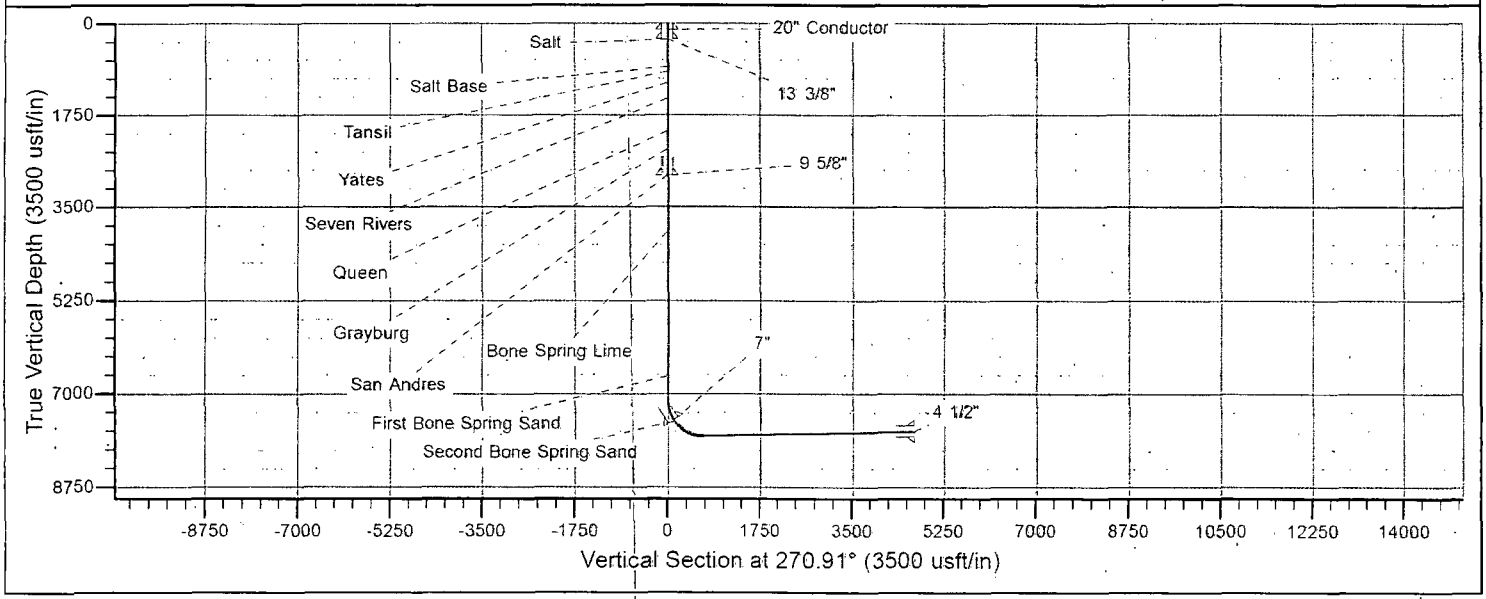
## FORMATION TOP DETAILS

| TVDPath | MDPath | Formation | DipAngle | DipDi |
|---|---|---|---|---|
| 295.2 | 295.2 | Salt | 0.00 | |
| 825.2 | 825.2 | Salt Base | 0.00 | |
| 915.2 | 915.2 | Tansil | 0.00 | |
| 1125.2 | 1125.2 | Yates | 0.00 | |
| 1425.2 | 1425.2 | Seven Rivers | 0.00 | |
| 2050.2 | 2050.2 | Queen | 0.00 | |
| 2395.2 | 2395.2 | Grayburg | 0.00 | |
| 2895.2 | 2895.2 | San Andres | 0.00 | |
| 3960.2 | 3960.2 | Bone Spring Lime | 0.00 | |
| 6675.2 | 6675.2 | First Bone Spring Sand | 0.00 | |
| 7525.2 | 7550.5 | Second Bone Spring Sand | 0.00 | |

## ANNOTATIONS

| TVD | MD | Inc | Azi | +N/-S | +E/-W | VSect | Departure | Annotation |
|---|---|---|---|---|---|---|---|---|
| 6800.0 | 6800.0 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | Start 353.2 hold at 6800.0 MD |
| 7153.2 | 7153.2 | 0.00 | 0.00 | 0.0 | 0.0 | 0.0 | 0.0 | Start Build 9.00 |
| 7525.2 | 7550.5 | 35.76 | 270.00 | 0.0 | -120.0 | 120.0 | 120.0 | Start DLS 9.02 TFO 0.00 |
| 7600.0 | 7648.5 | 44.60 | 270.00 | 0.0 | -183.2 | 183.1 | 183.2 | Start Build 9.11 |
| 7767.2 | 8160.9 | 91.27 | 270.00 | 0.0 | -645.0 | 644.9 | 645.0 | Start DLS 0.16 TFO 89.88 |
| 7769.2 | 8973.6 | 91.27 | 271.32 | 9.3 | -1457.5 | 1457.4 | 1457.5 | Start 2428.8 hold at 8973.6 MD |
| 7715.2 | 11402.4 | 91.27 | 271.32 | 65.2 | -3885.0 | 3885.6 | 3885.7 | Start DLS 0.16 TFO -90.09 |
| 7697.2 | 12215.1 | 91.27 | 270.00 | 74.6 | -4697.5 | 4698.1 | 4698.3 | TD at 12215.1 |



MURCHISON OIL & GAS, INC.

# Murchison Oil and Gas

**Mustang**
**Mustang Section 21**
**War Horse Federal Com #3H**

**War Horse Fed Com #3H**
**121123 War Horse Federal Com 3H**

## Anticollision Report

**07 December, 2012**

MOJO
DIRECTIONAL CORPORATION

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Reference Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site Error: | 1.0 usft | North Reference: | Grid |
| Reference Well: | War Horse Federal Com #3H | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 1.0 usft | Output errors are at | 2.00 sigma |
| Reference Wellbore | War Horse Fed Com #3H | Database: | EDM 5000.1 Single User Db |
| Reference Design: | 121123 War Horse Federal Com 3H | Offset TVD Reference: | Offset Datum |

**Reference** 121123 War Horse Federal Com 3H

| | | | |
|---|---|---|---|
| **Filter type:** | NO GLOBAL FILTER: Using user defined selection & filtering criteria | | |
| **Interpolation Method:** | MD + Stations Interval 30.0usft | **Error Model:** | ISCWSA |
| **Depth Range:** | Unlimited | **Scan Method:** | Closest Approach 3D |
| **Results Limited by:** | Maximum center-center distance of 10,000.0 usft | **Error Surface:** | Elliptical Conic |
| **Warning Levels Evaluated at:** | 2.00 **Sigma** | **Casing Method:** | Not applied |

**Survey Tool Program** **Date** 06/12/2012

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.0 | 12,250.0 | 121123 War Horse Federal Com 3H (War | MWD | MWD - Standard |

**Summary**

| Site Name / Offset Well - Wellbore - Design | Reference Measured Depth (usft) | Offset Measured Depth (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| Mustang Section 21 | | | | | | |
| Mustang Federal Com #2 - Mustang Federal Com #2 - M | 7,936.0 | 7,680.3 | 178.7 | 142.1 | 4.890 | CC, ES |
| Mustang Federal Com #2 - Mustang Federal Com #2 - M | 7,950.0 | 7,685.0 | 179.2 | 142.4 | 4.874 | SF |

**Offset Design** Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — Offset Site Error: 0.0 usft

Survey Program: 28 - MWD — Offset Well Error: 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 1.0 | -87.69 | 19.5 | -484.7 | 485.7 | | | | |
| 30.0 | 30.0 | 5.8 | 5.8 | 1.0 | 1.0 | -87.69 | 19.5 | -484.7 | 485.1 | 483.1 | 2.00 | 242.512 | |
| 60.0 | 60.0 | 35.7 | 35.7 | 1.0 | 1.0 | -87.68 | 19.6 | -484.7 | 485.1 | 483.1 | 2.00 | 242.291 | |
| 90.0 | 90.0 | 65.6 | 65.6 | 1.0 | 1.0 | -87.66 | 19.8 | -484.7 | 485.1 | 483.1 | 2.01 | 241.796 | |
| 100.0 | 100.0 | 75.6 | 75.6 | 1.0 | 1.0 | -87.65 | 19.9 | -484.7 | 485.1 | 483.1 | 2.01 | 241.570 | |
| 120.0 | 120.0 | 95.5 | 95.5 | 1.0 | 1.0 | -87.62 | 20.2 | -484.7 | 485.1 | 483.1 | 2.02 | 240.696 | |
| 150.0 | 150.0 | 125.4 | 125.4 | 1.0 | 1.0 | -87.56 | 20.6 | -484.7 | 485.1 | 483.1 | 2.03 | 238.853 | |
| 180.0 | 180.0 | 155.4 | 155.3 | 1.0 | 1.0 | -87.49 | 21.2 | -484.7 | 485.1 | 483.1 | 2.05 | 236.416 | |
| 200.0 | 200.0 | 175.3 | 175.3 | 1.0 | 1.0 | -87.44 | 21.7 | -484.7 | 485.1 | 483.1 | 2.07 | 234.492 | |
| 210.0 | 210.0 | 185.3 | 185.2 | 1.1 | 1.0 | -87.41 | 21.9 | -484.7 | 485.2 | 483.1 | 2.08 | 233.447 | |
| 240.0 | 240.0 | 215.1 | 215.1 | 1.1 | 1.0 | -87.31 | 22.8 | -484.7 | 485.2 | 483.1 | 2.11 | 230.015 | |
| 270.0 | 270.0 | 245.0 | 245.0 | 1.1 | 1.0 | -87.20 | 23.7 | -484.7 | 485.2 | 483.1 | 2.15 | 226.192 | |
| 300.0 | 300.0 | 274.9 | 274.8 | 1.1 | 1.1 | -87.07 | 24.8 | -484.7 | 485.3 | 483.1 | 2.19 | 222.051 | |
| 330.0 | 330.0 | 304.9 | 304.8 | 1.2 | 1.1 | -86.93 | 26.0 | -484.7 | 485.4 | 483.1 | 2.24 | 216.766 | |
| 360.0 | 360.0 | 334.8 | 334.7 | 1.2 | 1.1 | -86.79 | 27.2 | -484.7 | 485.4 | 483.1 | 2.30 | 210.930 | |
| 390.0 | 390.0 | 364.8 | 364.7 | 1.2 | 1.1 | -86.65 | 28.3 | -484.7 | 485.5 | 483.1 | 2.37 | 204.871 | |
| 400.0 | 400.0 | 374.8 | 374.7 | 1.3 | 1.1 | -86.61 | 28.7 | -484.7 | 485.5 | 483.1 | 2.39 | 202.821 | |
| 420.0 | 420.0 | 394.8 | 394.6 | 1.3 | 1.2 | -86.52 | 29.5 | -484.7 | 485.6 | 483.1 | 2.44 | 198.695 | |
| 450.0 | 450.0 | 424.8 | 424.6 | 1.3 | 1.2 | -86.38 | 30.7 | -484.7 | 485.6 | 483.1 | 2.52 | 192.490 | |
| 480.0 | 480.0 | 454.8 | 454.5 | 1.4 | 1.2 | -86.24 | 31.9 | -484.7 | 485.7 | 483.1 | 2.61 | 186.329 | |
| 500.0 | 500.0 | 474.7 | 474.5 | 1.4 | 1.3 | -86.15 | 32.6 | -484.7 | 485.8 | 483.1 | 2.66 | 182.275 | |
| 510.0 | 510.0 | 484.7 | 484.5 | 1.4 | 1.3 | -86.10 | 33.0 | -484.7 | 485.8 | 483.1 | 2.69 | 180.269 | |
| 540.0 | 540.0 | 514.7 | 514.5 | 1.5 | 1.3 | -85.96 | 34.2 | -484.7 | 485.9 | 483.1 | 2.79 | 174.353 | |
| 570.0 | 570.0 | 544.7 | 544.4 | 1.5 | 1.4 | -85.82 | 35.4 | -484.7 | 486.0 | 483.1 | 2.88 | 168.612 | |
| 600.0 | 600.0 | 574.6 | 574.3 | 1.6 | 1.4 | -85.68 | 36.6 | -484.7 | 486.0 | 483.1 | 2.98 | 163.080 | |

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

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Reference Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site Error: | 1.0 usft | North Reference: | Grid |
| Reference Well: | War Horse Federal Com #3H | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 1.0 usft | Output errors are at | 2.00 sigma |
| Reference Wellbore | War Horse Fed Com #3H | Database: | EDM 5000.1 Single User Db |
| Reference Design: | 121123 War Horse Federal Com 3H | Offset TVD Reference: | Offset Datum |

Offset Design: Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — Offset Site Error: 0.0 usft

Survey Program: 281-MWD — Offset Well Error: 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 630.0 | 630.0 | 604.5 | 604.2 | 1.6 | 1.5 | -85.53 | 37.9 | -484.7 | 486.1 | 483.1 | 3.08 | 157.759 | |
| 660.0 | 660.0 | 634.4 | 634.0 | 1.7 | 1.5 | -85.38 | 39.2 | -484.7 | 486.2 | 483.1 | 3.19 | 152.657 | |
| 690.0 | 690.0 | 664.3 | 663.9 | 1.7 | 1.6 | -85.21 | 40.6 | -484.7 | 486.4 | 483.1 | 3.29 | 147.776 | |
| 700.0 | 700.0 | 674.2 | 673.8 | 1.8 | 1.6 | -85.16 | 41.1 | -484.7 | 486.4 | 483.1 | 3.33 | 146.198 | |
| 720.0 | 720.0 | 694.1 | 693.7 | 1.8 | 1.6 | -85.04 | 42.0 | -484.7 | 486.5 | 483.1 | 3.40 | 143.114 | |
| 750.0 | 750.0 | 724.0 | 723.5 | 1.8 | 1.7 | -84.87 | 43.5 | -484.7 | 486.6 | 483.1 | 3.51 | 138.668 | |
| 780.0 | 780.0 | 753.9 | 753.4 | 1.9 | 1.8 | -84.68 | 45.1 | -484.7 | 486.8 | 483.1 | 3.62 | 134.430 | |
| 800.0 | 800.0 | 773.8 | 773.3 | 1.9 | 1.8 | -84.56 | 46.2 | -484.7 | 486.9 | 483.2 | 3.70 | 131.718 | |
| 810.0 | 810.0 | 783.7 | 783.2 | 2.0 | 1.8 | -84.49 | 46.7 | -484.7 | 486.9 | 483.2 | 3.73 | 130.395 | |
| 840.0 | 840.0 | 813.7 | 813.1 | 2.0 | 1.9 | -84.29 | 48.4 | -484.7 | 487.1 | 483.2 | 3.85 | 126.666 | |
| 870.0 | 870.0 | 843.8 | 843.2 | 2.1 | 1.9 | -84.10 | 50.0 | -484.7 | 487.2 | 483.3 | 3.96 | 123.195 | |
| 900.0 | 900.0 | 873.9 | 873.2 | 2.1 | 2.0 | -83.93 | 51.6 | -484.7 | 487.4 | 483.3 | 4.07 | 119.878 | |
| 930.0 | 930.0 | 904.0 | 903.3 | 2.2 | 2.0 | -83.76 | 53.0 | -484.7 | 487.6 | 483.4 | 4.18 | 116.708 | |
| 960.0 | 960.0 | 934.1 | 933.4 | 2.3 | 2.1 | -83.60 | 54.4 | -484.7 | 487.7 | 483.4 | 4.29 | 113.678 | |
| 990.0 | 990.0 | 964.3 | 963.5 | 2.3 | 2.1 | -83.45 | 55.7 | -484.7 | 487.9 | 483.4 | 4.40 | 110.781 | |
| 1,000.0 | 1,000.0 | 974.3 | 973.5 | 2.3 | 2.2 | -83.40 | 56.1 | -484.7 | 487.9 | 483.5 | 4.44 | 109.843 | |
| 1,020.0 | 1,020.0 | 994.4 | 993.6 | 2.4 | 2.2 | -83.31 | 56.9 | -484.7 | 488.0 | 483.5 | 4.52 | 108.009 | |
| 1,050.0 | 1,050.0 | 1,024.6 | 1,023.7 | 2.4 | 2.3 | -83.18 | 58.0 | -484.7 | 488.1 | 483.5 | 4.63 | 105.355 | |
| 1,080.0 | 1,080.0 | 1,054.7 | 1,053.8 | 2.5 | 2.3 | -83.06 | 59.0 | -484.7 | 488.2 | 483.5 | 4.75 | 102.873 | |
| 1,100.0 | 1,100.0 | 1,074.8 | 1,073.9 | 2.5 | 2.4 | -82.98 | 59.7 | -484.7 | 488.3 | 483.5 | 4.82 | 101.287 | |
| 1,110.0 | 1,110.0 | 1,084.8 | 1,084.0 | 2.6 | 2.4 | -82.94 | 60.0 | -484.7 | 488.4 | 483.5 | 4.86 | 100.510 | |
| 1,140.0 | 1,140.0 | 1,114.9 | 1,114.1 | 2.6 | 2.4 | -82.84 | 60.9 | -484.7 | 488.5 | 483.5 | 4.97 | 98.243 | |
| 1,170.0 | 1,170.0 | 1,145.1 | 1,144.2 | 2.7 | 2.5 | -82.74 | 61.7 | -484.7 | 488.6 | 483.5 | 5.09 | 96.065 | |
| 1,200.0 | 1,200.0 | 1,175.2 | 1,174.3 | 2.8 | 2.5 | -82.66 | 62.4 | -484.7 | 488.7 | 483.5 | 5.20 | 93.973 | |
| 1,230.0 | 1,230.0 | 1,205.3 | 1,204.5 | 2.8 | 2.6 | -82.58 | 63.1 | -484.7 | 488.8 | 483.4 | 5.31 | 91.962 | |
| 1,260.0 | 1,260.0 | 1,235.5 | 1,234.6 | 2.9 | 2.6 | -82.51 | 63.7 | -484.7 | 488.8 | 483.4 | 5.43 | 90.027 | |
| 1,290.0 | 1,290.0 | 1,265.6 | 1,264.7 | 2.9 | 2.7 | -82.45 | 64.3 | -484.7 | 488.9 | 483.4 | 5.55 | 88.134 | |
| 1,300.0 | 1,300.0 | 1,275.6 | 1,274.7 | 3.0 | 2.7 | -82.43 | 64.4 | -484.7 | 488.9 | 483.3 | 5.59 | 87.502 | |
| 1,320.0 | 1,320.0 | 1,295.6 | 1,294.7 | 3.0 | 2.8 | -82.39 | 64.8 | -484.7 | 489.0 | 483.3 | 5.67 | 86.265 | |
| 1,350.0 | 1,350.0 | 1,325.6 | 1,324.7 | 3.1 | 2.8 | -82.32 | 65.3 | -484.7 | 489.0 | 483.3 | 5.79 | 84.469 | |
| 1,380.0 | 1,380.0 | 1,355.6 | 1,354.7 | 3.1 | 2.9 | -82.26 | 65.8 | -484.7 | 489.1 | 483.2 | 5.91 | 82.742 | |
| 1,400.0 | 1,400.0 | 1,375.6 | 1,374.6 | 3.2 | 2.9 | -82.22 | 66.2 | -484.7 | 489.2 | 483.2 | 5.99 | 81.627 | |
| 1,410.0 | 1,410.0 | 1,385.6 | 1,384.6 | 3.2 | 2.9 | -82.20 | 66.4 | -484.7 | 489.2 | 483.1 | 6.03 | 81.080 | |
| 1,440.0 | 1,440.0 | 1,415.6 | 1,414.6 | 3.3 | 3.0 | -82.14 | 66.9 | -484.7 | 489.3 | 483.1 | 6.16 | 79.480 | |
| 1,470.0 | 1,470.0 | 1,445.6 | 1,444.6 | 3.3 | 3.0 | -82.08 | 67.4 | -484.7 | 489.3 | 483.0 | 6.28 | 77.939 | |
| 1,500.0 | 1,500.0 | 1,475.5 | 1,474.6 | 3.4 | 3.1 | -82.02 | 67.9 | -484.7 | 489.4 | 483.0 | 6.40 | 76.454 | |
| 1,530.0 | 1,530.0 | 1,505.5 | 1,504.5 | 3.5 | 3.2 | -81.96 | 68.5 | -484.7 | 489.5 | 482.9 | 6.53 | 74.981 | |
| 1,560.0 | 1,560.0 | 1,535.4 | 1,534.5 | 3.5 | 3.2 | -81.89 | 69.0 | -484.7 | 489.6 | 482.9 | 6.66 | 73.561 | |
| 1,590.0 | 1,590.0 | 1,565.4 | 1,564.4 | 3.6 | 3.3 | -81.83 | 69.6 | -484.7 | 489.6 | 482.9 | 6.78 | 72.193 | |
| 1,600.0 | 1,600.0 | 1,575.3 | 1,574.4 | 3.6 | 3.3 | -81.80 | 69.8 | -484.7 | 489.7 | 482.8 | 6.82 | 71.747 | |
| 1,620.0 | 1,620.0 | 1,595.3 | 1,594.3 | 3.6 | 3.4 | -81.76 | 70.2 | -484.7 | 489.7 | 482.8 | 6.91 | 70.873 | |
| 1,650.0 | 1,650.0 | 1,625.2 | 1,624.3 | 3.7 | 3.4 | -81.68 | 70.9 | -484.7 | 489.8 | 482.8 | 7.04 | 69.599 | |
| 1,680.0 | 1,680.0 | 1,655.2 | 1,654.2 | 3.8 | 3.5 | -81.61 | 71.5 | -484.7 | 489.9 | 482.7 | 7.17 | 68.369 | |
| 1,700.0 | 1,700.0 | 1,675.1 | 1,674.1 | 3.8 | 3.5 | -81.55 | 72.0 | -484.7 | 490.0 | 482.7 | 7.25 | 67.573 | |
| 1,710.0 | 1,710.0 | 1,685.1 | 1,684.1 | 3.8 | 3.5 | -81.53 | 72.2 | -484.7 | 490.0 | 482.7 | 7.29 | 67.182 | |
| 1,740.0 | 1,740.0 | 1,715.0 | 1,714.0 | 3.9 | 3.6 | -81.45 | 72.9 | -484.7 | 490.1 | 482.7 | 7.42 | 66.034 | |
| 1,770.0 | 1,770.0 | 1,745.0 | 1,744.0 | 4.0 | 3.7 | -81.36 | 73.6 | -484.7 | 490.2 | 482.7 | 7.55 | 64.925 | |
| 1,800.0 | 1,800.0 | 1,774.9 | 1,773.9 | 4.0 | 3.7 | -81.27 | 74.4 | -484.7 | 490.3 | 482.7 | 7.68 | 63.851 | |
| 1,830.0 | 1,830.0 | 1,804.8 | 1,803.8 | 4.1 | 3.8 | -81.18 | 75.2 | -484.7 | 490.5 | 482.7 | 7.81 | 62.813 | |
| 1,860.0 | 1,860.0 | 1,834.7 | 1,833.7 | 4.2 | 3.9 | -81.09 | 76.0 | -484.7 | 490.6 | 482.6 | 7.94 | 61.808 | |
| 1,890.0 | 1,890.0 | 1,864.7 | 1,863.6 | 4.2 | 3.9 | -80.99 | 76.8 | -484.7 | 490.7 | 482.6 | 8.07 | 60.834 | |
| 1,900.0 | 1,900.0 | 1,874.6 | 1,873.6 | 4.3 | 3.9 | -80.96 | 77.1 | -484.7 | 490.8 | 482.6 | 8.11 | 60.516 | |

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

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Reference Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site Error: | 1.0 usft | North Reference: | Grid |
| Reference Well: | War Horse Federal Com #3H | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 1.0 usft | Output errors are at | 2.00 sigma |
| Reference Wellbore | War Horse Fed Com #3H | Database: | EDM 5000.1 Single User Db |
| Reference Design: | 121123 War Horse Federal Com 3H | Offset TVD Reference: | Offset Datum |

Offset Design: 1 Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — Offset Site Error: 0.0 usft

Survey Program: 261-MWD — Offset Well Error: 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,920.0 | 1,920.0 | 1,894.6 | 1,893.5 | 4.3 | 4.0 | -80.90 | 77.7 | -484.7 | 490.8 | 482.7 | 8.20 | 59.891 | |
| 1,950.0 | 1,950.0 | 1,924.5 | 1,923.5 | 4.4 | 4.1 | -80.79 | 78.6 | -484.7 | 491.0 | 482.7 | 8.33 | 58.977 | |
| 1,980.0 | 1,980.0 | 1,954.5 | 1,953.4 | 4.4 | 4.1 | -80.69 | 79.5 | -484.7 | 491.1 | 482.7 | 8.45 | 58.095 | |
| 2,000.0 | 2,000.0 | 1,974.5 | 1,973.4 | 4.5 | 4.2 | -80.62 | 80.1 | -484.7 | 491.2 | 482.7 | 8.54 | 57.534 | |
| 2,010.0 | 2,010.0 | 1,984.6 | 1,983.5 | 4.5 | 4.2 | -80.59 | 80.3 | -484.7 | 491.3 | 482.7 | 8.58 | 57.258 | |
| 2,040.0 | 2,040.0 | 2,014.7 | 2,013.6 | 4.6 | 4.2 | -80.49 | 81.2 | -484.7 | 491.4 | 482.7 | 8.71 | 56.444 | |
| 2,070.0 | 2,070.0 | 2,044.8 | 2,043.7 | 4.6 | 4.3 | -80.40 | 82.0 | -484.7 | 491.6 | 482.7 | 8.83 | 55.652 | |
| 2,100.0 | 2,100.0 | 2,074.9 | 2,073.7 | 4.7 | 4.4 | -80.31 | 82.8 | -484.7 | 491.7 | 482.7 | 8.96 | 54.881 | |
| 2,130.0 | 2,130.0 | 2,105.0 | 2,103.8 | 4.8 | 4.4 | -80.22 | 83.5 | -484.7 | 491.8 | 482.7 | 9.09 | 54.131 | |
| 2,160.0 | 2,160.0 | 2,135.1 | 2,133.9 | 4.8 | 4.5 | -80.15 | 84.2 | -484.7 | 491.9 | 482.7 | 9.21 | 53.399 | |
| 2,190.0 | 2,190.0 | 2,165.1 | 2,163.9 | 4.9 | 4.6 | -80.07 | 84.8 | -484.7 | 492.0 | 482.7 | 9.34 | 52.688 | |
| 2,200.0 | 2,200.0 | 2,175.0 | 2,173.9 | 4.9 | 4.6 | -80.05 | 85.1 | -484.7 | 492.1 | 482.7 | 9.38 | 52.455 | |
| 2,220.0 | 2,220.0 | 2,195.0 | 2,193.9 | 5.0 | 4.6 | -79.99 | 85.5 | -484.7 | 492.1 | 482.7 | 9.47 | 51.996 | |
| 2,250.0 | 2,250.0 | 2,225.0 | 2,223.8 | 5.0 | 4.7 | -79.91 | 86.2 | -484.7 | 492.3 | 482.7 | 9.59 | 51.322 | |
| 2,280.0 | 2,280.0 | 2,254.9 | 2,253.7 | 5.1 | 4.7 | -79.83 | 86.9 | -484.7 | 492.4 | 482.7 | 9.72 | 50.666 | |
| 2,300.0 | 2,300.0 | 2,274.9 | 2,273.7 | 5.1 | 4.8 | -79.78 | 87.4 | -484.7 | 492.5 | 482.7 | 9.80 | 50.237 | |
| 2,310.0 | 2,310.0 | 2,284.8 | 2,283.7 | 5.2 | 4.8 | -79.75 | 87.6 | -484.7 | 492.5 | 482.7 | 9.85 | 50.026 | |
| 2,340.0 | 2,340.0 | 2,314.8 | 2,313.6 | 5.2 | 4.9 | -79.67 | 88.4 | -484.7 | 492.7 | 482.7 | 9.97 | 49.403 | |
| 2,370.0 | 2,370.0 | 2,344.7 | 2,343.5 | 5.3 | 4.9 | -79.58 | 89.1 | -484.7 | 492.8 | 482.7 | 10.10 | 48.795 | |
| 2,400.0 | 2,400.0 | 2,374.7 | 2,373.5 | 5.4 | 5.0 | -79.49 | 89.9 | -484.7 | 492.9 | 482.7 | 10.23 | 48.203 | |
| 2,430.0 | 2,430.0 | 2,404.6 | 2,403.4 | 5.4 | 5.0 | -79.40 | 90.7 | -484.7 | 493.1 | 482.7 | 10.35 | 47.618 | |
| 2,460.0 | 2,460.0 | 2,434.5 | 2,433.2 | 5.5 | 5.1 | -79.31 | 91.5 | -484.7 | 493.2 | 482.7 | 10.49 | 47.037 | |
| 2,490.0 | 2,490.0 | 2,464.3 | 2,463.1 | 5.6 | 5.2 | -79.21 | 92.4 | -484.7 | 493.4 | 482.8 | 10.62 | 46.471 | |
| 2,500.0 | 2,500.0 | 2,474.3 | 2,473.0 | 5.6 | 5.2 | -79.18 | 92.6 | -484.7 | 493.4 | 482.8 | 10.66 | 46.286 | |
| 2,520.0 | 2,520.0 | 2,494.2 | 2,492.9 | 5.6 | 5.2 | -79.11 | 93.3 | -484.7 | 493.6 | 482.8 | 10.75 | 45.920 | |
| 2,550.0 | 2,550.0 | 2,524.0 | 2,522.8 | 5.7 | 5.3 | -79.00 | 94.2 | -484.7 | 493.7 | 482.9 | 10.88 | 45.382 | |
| 2,580.0 | 2,580.0 | 2,553.9 | 2,552.6 | 5.8 | 5.4 | -78.89 | 95.2 | -484.7 | 493.9 | 482.9 | 11.01 | 44.859 | |
| 2,600.0 | 2,600.0 | 2,573.8 | 2,572.5 | 5.8 | 5.4 | -78.81 | 95.9 | -484.7 | 494.1 | 483.0 | 11.10 | 44.517 | |
| 2,610.0 | 2,610.0 | 2,583.8 | 2,582.4 | 5.8 | 5.4 | -78.77 | 96.2 | -484.7 | 494.1 | 483.0 | 11.14 | 44.349 | |
| 2,640.0 | 2,640.0 | 2,613.8 | 2,612.5 | 5.9 | 5.5 | -78.65 | 97.2 | -484.7 | 494.3 | 483.1 | 11.27 | 43.864 | |
| 2,670.0 | 2,670.0 | 2,643.9 | 2,642.5 | 6.0 | 5.6 | -78.54 | 98.3 | -484.7 | 494.5 | 483.1 | 11.40 | 43.389 | |
| 2,700.0 | 2,700.0 | 2,673.9 | 2,672.5 | 6.0 | 5.6 | -78.43 | 99.3 | -484.7 | 494.7 | 483.2 | 11.53 | 42.924 | |
| 2,730.0 | 2,730.0 | 2,704.0 | 2,702.6 | 6.1 | 5.7 | -78.32 | 100.2 | -484.7 | 494.9 | 483.3 | 11.65 | 42.469 | |
| 2,760.0 | 2,760.0 | 2,734.0 | 2,732.6 | 6.2 | 5.8 | -78.21 | 101.2 | -484.7 | 495.1 | 483.3 | 11.78 | 42.024 | |
| 2,790.0 | 2,790.0 | 2,764.1 | 2,762.7 | 6.2 | 5.8 | -78.10 | 102.1 | -484.7 | 495.3 | 483.4 | 11.91 | 41.587 | |
| 2,800.0 | 2,800.0 | 2,774.1 | 2,772.7 | 6.2 | 5.8 | -78.07 | 102.4 | -484.7 | 495.4 | 483.4 | 11.95 | 41.446 | |
| 2,820.0 | 2,820.0 | 2,794.2 | 2,792.7 | 6.3 | 5.9 | -78.00 | 103.0 | -484.7 | 495.5 | 483.5 | 12.04 | 41.168 | |
| 2,850.0 | 2,850.0 | 2,824.3 | 2,822.8 | 6.4 | 5.9 | -77.90 | 103.9 | -484.7 | 495.7 | 483.5 | 12.16 | 40.758 | |
| 2,880.0 | 2,880.0 | 2,854.4 | 2,852.9 | 6.4 | 6.0 | -77.81 | 104.7 | -484.7 | 495.9 | 483.6 | 12.29 | 40.357 | |
| 2,900.0 | 2,900.0 | 2,874.4 | 2,873.0 | 6.5 | 6.0 | -77.74 | 105.3 | -484.7 | 496.0 | 483.6 | 12.37 | 40.093 | |
| 2,910.0 | 2,910.0 | 2,884.5 | 2,883.0 | 6.5 | 6.1 | -77.71 | 105.5 | -484.7 | 496.0 | 483.6 | 12.41 | 39.962 | |
| 2,940.0 | 2,940.0 | 2,914.6 | 2,913.1 | 6.6 | 6.1 | -77.63 | 106.3 | -484.7 | 496.2 | 483.7 | 12.54 | 39.576 | |
| 2,970.0 | 2,970.0 | 2,944.7 | 2,943.2 | 6.6 | 6.2 | -77.54 | 107.1 | -484.7 | 496.4 | 483.7 | 12.66 | 39.196 | |
| 3,000.0 | 3,000.0 | 2,974.8 | 2,973.3 | 6.7 | 6.2 | -77.46 | 107.8 | -484.7 | 496.5 | 483.7 | 12.79 | 38.823 | |
| 3,030.0 | 3,030.0 | 3,004.9 | 3,003.4 | 6.8 | 6.3 | -77.39 | 108.5 | -484.7 | 496.7 | 483.7 | 12.91 | 38.456 | |
| 3,060.0 | 3,060.0 | 3,035.0 | 3,033.5 | 6.8 | 6.4 | -77.31 | 109.1 | -484.7 | 496.8 | 483.8 | 13.04 | 38.097 | |
| 3,090.0 | 3,090.0 | 3,065.1 | 3,063.6 | 6.9 | 6.4 | -77.24 | 109.7 | -484.7 | 496.9 | 483.8 | 13.17 | 37.743 | |
| 3,100.0 | 3,100.0 | 3,075.2 | 3,073.7 | 6.9 | 6.4 | -77.22 | 109.9 | -484.7 | 497.0 | 483.8 | 13.21 | 37.627 | |
| 3,120.0 | 3,120.0 | 3,095.2 | 3,093.7 | 7.0 | 6.5 | -77.18 | 110.3 | -484.7 | 497.1 | 483.8 | 13.29 | 37.396 | |
| 3,150.0 | 3,150.0 | 3,125.4 | 3,123.9 | 7.0 | 6.5 | -77.12 | 110.8 | -484.7 | 497.2 | 483.8 | 13.42 | 37.054 | |
| 3,180.0 | 3,180.0 | 3,155.4 | 3,153.9 | 7.1 | 6.6 | -77.06 | 111.4 | -484.7 | 497.3 | 483.7 | 13.54 | 36.714 | |
| 3,200.0 | 3,200.0 | 3,175.5 | 3,174.0 | 7.1 | 6.6 | -77.02 | 111.7 | -484.7 | 497.4 | 483.7 | 13.63 | 36.491 | |

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

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Reference Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site Error: | 1.0 usft | North Reference: | Grid |
| Reference Well: | War Horse Federal Com #3H | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 1.0 usft | Output errors are at | 2.00 sigma |
| Reference Wellbore | War Horse Fed Com #3H | Database: | EDM 5000.1 Single User Db |
| Reference Design: | 121123 War Horse Federal Com 3H | Offset TVD Reference: | Offset Datum |

Offset Design: Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — Offset Site Error: 0.0 usft

Survey Program: 281-MWD — Offset Well Error: 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 3,210.0 | 3,210.0 | 3,185.5 | 3,184.0 | 7.2 | 6.7 | -77.00 | 111.9 | -484.7 | 497.4 | 483.7 | 13.67 | 36.380 | |
| 3,240.0 | 3,240.0 | 3,215.5 | 3,214.0 | 7.2 | 6.7 | -76.95 | 112.3 | -484.7 | 497.5 | 483.7 | 13.80 | 36.051 | |
| 3,270.0 | 3,270.0 | 3,245.6 | 3,244.1 | 7.3 | 6.8 | -76.90 | 112.8 | -484.7 | 497.6 | 483.7 | 13.93 | 35.728 | |
| 3,300.0 | 3,300.0 | 3,275.7 | 3,274.1 | 7.4 | 6.8 | -76.85 | 113.3 | -484.7 | 497.7 | 483.7 | 14.06 | 35.411 | |
| 3,330.0 | 3,330.0 | 3,305.7 | 3,304.2 | 7.4 | 6.9 | -76.80 | 113.7 | -484.7 | 497.8 | 483.6 | 14.18 | 35.099 | |
| 3,360.0 | 3,360.0 | 3,335.8 | 3,334.3 | 7.5 | 7.0 | -76.75 | 114.1 | -484.7 | 497.9 | 483.6 | 14.31 | 34.792 | |
| 3,390.0 | 3,390.0 | 3,365.9 | 3,364.3 | 7.6 | 7.0 | -76.71 | 114.5 | -484.7 | 498.0 | 483.6 | 14.44 | 34.491 | |
| 3,400.0 | 3,400.0 | 3,375.9 | 3,374.3 | 7.6 | 7.1 | -76.69 | 114.6 | -484.7 | 498.0 | 483.5 | 14.48 | 34.391 | |
| 3,420.0 | 3,420.0 | 3,395.9 | 3,394.4 | 7.6 | 7.1 | -76.67 | 114.9 | -484.7 | 498.1 | 483.5 | 14.57 | 34.194 | |
| 3,450.0 | 3,450.0 | 3,426.0 | 3,424.5 | 7.7 | 7.2 | -76.63 | 115.2 | -484.7 | 498.2 | 483.5 | 14.69 | 33.903 | |
| 3,480.0 | 3,480.0 | 3,456.1 | 3,454.5 | 7.8 | 7.2 | -76.59 | 115.6 | -484.7 | 498.2 | 483.4 | 14.82 | 33.616 | |
| 3,500.0 | 3,500.0 | 3,476.1 | 3,474.6 | 7.8 | 7.3 | -76.56 | 115.8 | -484.7 | 498.3 | 483.4 | 14.91 | 33.427 | |
| 3,510.0 | 3,510.0 | 3,486.1 | 3,484.6 | 7.8 | 7.3 | -76.55 | 115.9 | -484.7 | 498.3 | 483.4 | 14.95 | 33.333 | |
| 3,540.0 | 3,540.0 | 3,516.2 | 3,514.6 | 7.9 | 7.3 | -76.52 | 116.2 | -484.7 | 498.4 | 483.3 | 15.08 | 33.055 | |
| 3,570.0 | 3,570.0 | 3,546.3 | 3,544.7 | 8.0 | 7.4 | -76.48 | 116.5 | -484.7 | 498.5 | 483.3 | 15.21 | 32.782 | |
| 3,600.0 | 3,600.0 | 3,576.3 | 3,574.8 | 8.0 | 7.5 | -76.45 | 116.8 | -484.7 | 498.5 | 483.2 | 15.33 | 32.512 | |
| 3,630.0 | 3,630.0 | 3,606.4 | 3,604.8 | 8.1 | 7.5 | -76.42 | 117.0 | -484.7 | 498.6 | 483.1 | 15.46 | 32.247 | |
| 3,660.0 | 3,660.0 | 3,636.5 | 3,634.9 | 8.2 | 7.6 | -76.40 | 117.3 | -484.7 | 498.6 | 483.1 | 15.59 | 31.986 | |
| 3,690.0 | 3,690.0 | 3,666.5 | 3,665.0 | 8.2 | 7.6 | -76.37 | 117.5 | -484.7 | 498.7 | 483.0 | 15.72 | 31.729 | |
| 3,700.0 | 3,700.0 | 3,676.5 | 3,675.0 | 8.2 | 7.7 | -76.37 | 117.6 | -484.7 | 498.7 | 483.0 | 15.76 | 31.644 | |
| 3,720.0 | 3,720.0 | 3,696.6 | 3,695.0 | 8.3 | 7.7 | -76.35 | 117.7 | -484.7 | 498.7 | 482.9 | 15.85 | 31.476 | |
| 3,750.0 | 3,750.0 | 3,726.7 | 3,725.1 | 8.4 | 7.8 | -76.33 | 117.9 | -484.7 | 498.8 | 482.8 | 15.97 | 31.227 | |
| 3,780.0 | 3,780.0 | 3,756.7 | 3,755.2 | 8.4 | 7.8 | -76.31 | 118.0 | -484.7 | 498.8 | 482.7 | 16.10 | 30.981 | |
| 3,800.0 | 3,800.0 | 3,776.8 | 3,775.2 | 8.5 | 7.9 | -76.30 | 118.2 | -484.7 | 498.9 | 482.7 | 16.19 | 30.818 | |
| 3,810.0 | 3,810.0 | 3,786.8 | 3,785.2 | 8.5 | 7.9 | -76.29 | 118.2 | -484.7 | 498.9 | 482.6 | 16.23 | 30.737 | |
| 3,840.0 | 3,840.0 | 3,816.9 | 3,815.3 | 8.6 | 7.9 | -76.28 | 118.3 | -484.7 | 498.9 | 482.5 | 16.36 | 30.496 | |
| 3,870.0 | 3,870.0 | 3,847.0 | 3,845.4 | 8.6 | 8.0 | -76.27 | 118.4 | -484.7 | 498.9 | 482.4 | 16.49 | 30.259 | |
| 3,900.0 | 3,900.0 | 3,877.0 | 3,875.5 | 8.7 | 8.1 | -76.26 | 118.5 | -484.7 | 498.9 | 482.3 | 16.62 | 30.025 | |
| 3,930.0 | 3,930.0 | 3,907.1 | 3,905.6 | 8.8 | 8.1 | -76.25 | 118.6 | -484.7 | 499.0 | 482.2 | 16.75 | 29.794 | |
| 3,960.0 | 3,960.0 | 3,937.0 | 3,935.4 | 8.8 | 8.2 | -76.24 | 118.7 | -484.7 | 499.0 | 482.1 | 16.88 | 29.568 | |
| 3,990.0 | 3,990.0 | 3,966.7 | 3,965.2 | 8.9 | 8.3 | -76.23 | 118.8 | -484.7 | 499.0 | 482.0 | 17.00 | 29.346 | |
| 4,000.0 | 4,000.0 | 3,976.6 | 3,975.1 | 8.9 | 8.3 | -76.22 | 118.8 | -484.7 | 499.0 | 482.0 | 17.05 | 29.273 | |
| 4,020.0 | 4,020.0 | 3,996.5 | 3,994.9 | 9.0 | 8.3 | -76.21 | 119.0 | -484.7 | 499.1 | 481.9 | 17.13 | 29.128 | |
| 4,050.0 | 4,050.0 | 4,026.2 | 4,024.6 | 9.0 | 8.4 | -76.18 | 119.2 | -484.7 | 499.1 | 481.9 | 17.26 | 28.914 | |
| 4,080.0 | 4,080.0 | 4,055.9 | 4,054.4 | 9.1 | 8.4 | -76.14 | 119.6 | -484.7 | 499.2 | 481.8 | 17.39 | 28.705 | |
| 4,100.0 | 4,100.0 | 4,075.7 | 4,074.2 | 9.1 | 8.5 | -76.11 | 119.8 | -484.7 | 499.3 | 481.8 | 17.48 | 28.567 | |
| 4,110.0 | 4,110.0 | 4,085.6 | 4,084.1 | 9.2 | 8.5 | -76.10 | 120.0 | -484.7 | 499.3 | 481.8 | 17.52 | 28.499 | |
| 4,140.0 | 4,140.0 | 4,115.4 | 4,113.8 | 9.2 | 8.6 | -76.05 | 120.4 | -484.7 | 499.4 | 481.7 | 17.65 | 28.297 | |
| 4,170.0 | 4,170.0 | 4,145.4 | 4,143.8 | 9.3 | 8.6 | -75.99 | 120.9 | -484.7 | 499.5 | 481.7 | 17.78 | 28.098 | |
| 4,200.0 | 4,200.0 | 4,175.7 | 4,174.1 | 9.4 | 8.7 | -75.94 | 121.4 | -484.7 | 499.6 | 481.7 | 17.91 | 27.900 | |
| 4,230.0 | 4,230.0 | 4,205.9 | 4,204.4 | 9.4 | 8.7 | -75.90 | 121.8 | -484.7 | 499.7 | 481.7 | 18.04 | 27.704 | |
| 4,260.0 | 4,260.0 | 4,236.2 | 4,234.6 | 9.5 | 8.8 | -75.86 | 122.1 | -484.7 | 499.8 | 481.6 | 18.17 | 27.510 | |
| 4,290.0 | 4,290.0 | 4,266.5 | 4,264.9 | 9.6 | 8.9 | -75.83 | 122.3 | -484.7 | 499.9 | 481.6 | 18.30 | 27.318 | |
| 4,300.0 | 4,300.0 | 4,276.5 | 4,274.9 | 9.6 | 8.9 | -75.82 | 122.4 | -484.7 | 499.9 | 481.5 | 18.34 | 27.255 | |
| 4,320.0 | 4,320.0 | 4,296.5 | 4,294.9 | 9.6 | 8.9 | -75.81 | 122.6 | -484.7 | 499.9 | 481.5 | 18.43 | 27.129 | |
| 4,350.0 | 4,350.0 | 4,326.4 | 4,324.9 | 9.7 | 9.0 | -75.78 | 122.8 | -484.7 | 500.0 | 481.4 | 18.56 | 26.943 | |
| 4,380.0 | 4,380.0 | 4,356.4 | 4,354.8 | 9.8 | 9.1 | -75.76 | 123.0 | -484.7 | 500.0 | 481.3 | 18.69 | 26.759 | |
| 4,400.0 | 4,400.0 | 4,376.4 | 4,374.8 | 9.8 | 9.1 | -75.74 | 123.2 | -484.7 | 500.1 | 481.3 | 18.77 | 26.639 | |
| 4,410.0 | 4,410.0 | 4,386.4 | 4,384.8 | 9.8 | 9.1 | -75.73 | 123.3 | -484.7 | 500.1 | 481.3 | 18.82 | 26.579 | |
| 4,440.0 | 4,440.0 | 4,416.3 | 4,414.7 | 9.9 | 9.2 | -75.70 | 123.5 | -484.7 | 500.2 | 481.2 | 18.94 | 26.401 | |
| 4,470.0 | 4,470.0 | 4,446.4 | 4,444.8 | 10.0 | 9.2 | -75.67 | 123.8 | -484.7 | 500.2 | 481.1 | 19.07 | 26.224 | |
| 4,500.0 | 4,500.0 | 4,476.5 | 4,474.9 | 10.0 | 9.3 | -75.65 | 124.0 | -484.7 | 500.3 | 481.1 | 19.20 | 26.050 | |

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

| | | | |
|---|---|---|---|
| **Company:** | Murchison Oil and Gas | **Local Co-ordinate Reference:** | Well War Horse Federal Com #3H |
| **Project:** | Mustang | **TVD Reference:** | WELL @ 3495.2usft (Original Well Elev) |
| **Reference Site:** | Mustang Section 21 | **MD Reference:** | WELL @ 3495.2usft (Original Well Elev) |
| **Site Error:** | 1.0 usft | **North Reference:** | Grid |
| **Reference Well:** | War Horse Federal Com #3H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 1.0 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | War Horse Fed Com #3H | **Database:** | EDM 5000.1 Single User Db |
| **Reference Design:** | 121123 War Horse Federal Com 3H | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — Offset Site Error: 0.0 usft

Survey Program: 281-MWD — Offset Well Error: 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4,530.0 | 4,530.0 | 4,506.6 | 4,505.0 | 10.1 | 9.4 | -75.63 | 124.2 | -484.7 | 500.3 | 481.0 | 19.33 | 25.878 | |
| 4,560.0 | 4,560.0 | 4,536.7 | 4,535.1 | 10.2 | 9.4 | -75.61 | 124.4 | -484.7 | 500.4 | 480.9 | 19.46 | 25.708 | |
| 4,590.0 | 4,590.0 | 4,566.8 | 4,565.2 | 10.2 | 9.5 | -75.59 | 124.5 | -484.7 | 500.4 | 480.8 | 19.59 | 25.540 | |
| 4,600.0 | 4,600.0 | 4,576.8 | 4,575.2 | 10.3 | 9.5 | -75.58 | 124.6 | -484.7 | 500.4 | 480.8 | 19.64 | 25.484 | |
| 4,620.0 | 4,620.0 | 4,596.8 | 4,595.2 | 10.3 | 9.6 | -75.57 | 124.7 | -484.7 | 500.4 | 480.7 | 19.72 | 25.374 | |
| 4,650.0 | 4,650.0 | 4,626.8 | 4,625.2 | 10.4 | 9.6 | -75.56 | 124.8 | -484.7 | 500.5 | 480.6 | 19.85 | 25.210 | |
| 4,680.0 | 4,680.0 | 4,656.9 | 4,655.3 | 10.4 | 9.7 | -75.54 | 125.0 | -484.7 | 500.5 | 480.5 | 19.98 | 25.047 | |
| 4,700.0 | 4,700.0 | 4,676.9 | 4,675.3 | 10.5 | 9.7 | -75.53 | 125.0 | -484.7 | 500.5 | 480.5 | 20.07 | 24.940 | |
| 4,710.0 | 4,710.0 | 4,686.9 | 4,685.3 | 10.5 | 9.7 | -75.53 | 125.1 | -484.7 | 500.5 | 480.4 | 20.11 | 24.887 | |
| 4,740.0 | 4,740.0 | 4,716.9 | 4,715.3 | 10.6 | 9.8 | -75.52 | 125.2 | -484.7 | 500.6 | 480.3 | 20.24 | 24.729 | |
| 4,770.0 | 4,770.0 | 4,746.9 | 4,745.3 | 10.6 | 9.9 | -75.50 | 125.3 | -484.7 | 500.6 | 480.2 | 20.37 | 24.573 | |
| 4,800.0 | 4,800.0 | 4,776.6 | 4,775.0 | 10.7 | 9.9 | -75.49 | 125.5 | -484.7 | 500.6 | 480.1 | 20.50 | 24.421 | |
| 4,830.0 | 4,830.0 | 4,806.3 | 4,804.7 | 10.8 | 10.0 | -75.46 | 125.7 | -484.7 | 500.7 | 480.1 | 20.63 | 24.271 | |
| 4,860.0 | 4,860.0 | 4,835.9 | 4,834.4 | 10.8 | 10.1 | -75.43 | 126.0 | -484.7 | 500.8 | 480.0 | 20.76 | 24.124 | |
| 4,890.0 | 4,890.0 | 4,865.8 | 4,864.2 | 10.9 | 10.1 | -75.38 | 126.4 | -484.7 | 500.9 | 480.0 | 20.89 | 23.979 | |
| 4,900.0 | 4,900.0 | 4,875.8 | 4,874.2 | 10.9 | 10.1 | -75.37 | 126.5 | -484.7 | 500.9 | 480.0 | 20.93 | 23.931 | |
| 4,920.0 | 4,920.0 | 4,895.9 | 4,894.3 | 11.0 | 10.2 | -75.34 | 126.8 | -484.7 | 501.0 | 479.9 | 21.02 | 23.835 | |
| 4,950.0 | 4,950.0 | 4,926.0 | 4,924.4 | 11.0 | 10.2 | -75.30 | 127.1 | -484.7 | 501.1 | 479.9 | 21.15 | 23.693 | |
| 4,980.0 | 4,980.0 | 4,956.1 | 4,954.5 | 11.1 | 10.3 | -75.27 | 127.4 | -484.7 | 501.1 | 479.9 | 21.28 | 23.552 | |
| 5,000.0 | 5,000.0 | 4,976.2 | 4,974.6 | 11.2 | 10.3 | -75.25 | 127.6 | -484.7 | 501.2 | 479.8 | 21.36 | 23.459 | |
| 5,010.0 | 5,010.0 | 4,986.2 | 4,984.6 | 11.2 | 10.4 | -75.23 | 127.7 | -484.7 | 501.2 | 479.8 | 21.41 | 23.412 | |
| 5,040.0 | 5,040.0 | 5,016.4 | 5,014.8 | 11.2 | 10.4 | -75.21 | 128.0 | -484.7 | 501.3 | 479.7 | 21.54 | 23.273 | |
| 5,070.0 | 5,070.0 | 5,046.6 | 5,045.0 | 11.3 | 10.5 | -75.18 | 128.2 | -484.7 | 501.3 | 479.7 | 21.67 | 23.136 | |
| 5,100.0 | 5,100.0 | 5,076.7 | 5,075.1 | 11.4 | 10.6 | -75.16 | 128.4 | -484.7 | 501.4 | 479.6 | 21.80 | 22.999 | |
| 5,130.0 | 5,130.0 | 5,106.9 | 5,105.3 | 11.4 | 10.6 | -75.15 | 128.5 | -484.7 | 501.4 | 479.5 | 21.93 | 22.864 | |
| 5,160.0 | 5,160.0 | 5,137.1 | 5,135.5 | 11.5 | 10.7 | -75.14 | 128.6 | -484.7 | 501.4 | 479.4 | 22.06 | 22.729 | |
| 5,190.0 | 5,190.0 | 5,166.9 | 5,165.3 | 11.6 | 10.7 | -75.13 | 128.7 | -484.7 | 501.5 | 479.3 | 22.19 | 22.597 | |
| 5,200.0 | 5,200.0 | 5,176.8 | 5,175.2 | 11.6 | 10.8 | -75.12 | 128.7 | -484.7 | 501.5 | 479.2 | 22.23 | 22.554 | |
| 5,220.0 | 5,220.0 | 5,196.4 | 5,194.8 | 11.6 | 10.8 | -75.11 | 128.9 | -484.7 | 501.5 | 479.2 | 22.32 | 22.469 | |
| 5,250.0 | 5,250.0 | 5,226.0 | 5,224.4 | 11.7 | 10.9 | -75.08 | 129.1 | -484.7 | 501.6 | 479.1 | 22.45 | 22.344 | |
| 5,280.0 | 5,280.0 | 5,256.0 | 5,254.4 | 11.8 | 10.9 | -75.04 | 129.5 | -484.7 | 501.7 | 479.1 | 22.58 | 22.220 | |
| 5,300.0 | 5,300.0 | 5,275.9 | 5,274.3 | 11.8 | 11.0 | -75.02 | 129.7 | -484.7 | 501.7 | 479.1 | 22.66 | 22.138 | |
| 5,310.0 | 5,310.0 | 5,285.9 | 5,284.3 | 11.8 | 11.0 | -75.01 | 129.8 | -484.7 | 501.7 | 479.0 | 22.71 | 22.098 | |
| 5,340.0 | 5,340.0 | 5,315.8 | 5,314.2 | 11.9 | 11.1 | -74.97 | 130.2 | -484.7 | 501.8 | 479.0 | 22.83 | 21.977 | |
| 5,370.0 | 5,370.0 | 5,345.9 | 5,344.3 | 12.0 | 11.1 | -74.93 | 130.5 | -484.7 | 501.9 | 479.0 | 22.96 | 21.856 | |
| 5,400.0 | 5,400.0 | 5,376.0 | 5,374.3 | 12.0 | 11.2 | -74.89 | 130.9 | -484.7 | 502.0 | 478.9 | 23.09 | 21.737 | |
| 5,430.0 | 5,430.0 | 5,406.0 | 5,404.4 | 12.1 | 11.2 | -74.85 | 131.2 | -484.7 | 502.1 | 478.9 | 23.22 | 21.619 | |
| 5,460.0 | 5,460.0 | 5,436.1 | 5,434.5 | 12.2 | 11.3 | -74.82 | 131.5 | -484.7 | 502.2 | 478.8 | 23.35 | 21.503 | |
| 5,490.0 | 5,490.0 | 5,466.2 | 5,464.5 | 12.2 | 11.4 | -74.79 | 131.8 | -484.7 | 502.3 | 478.8 | 23.48 | 21.387 | |
| 5,500.0 | 5,500.0 | 5,476.2 | 5,474.6 | 12.3 | 11.4 | -74.78 | 131.9 | -484.7 | 502.3 | 478.8 | 23.53 | 21.349 | |
| 5,520.0 | 5,520.0 | 5,496.2 | 5,494.6 | 12.3 | 11.4 | -74.75 | 132.1 | -484.7 | 502.3 | 478.7 | 23.61 | 21.272 | |
| 5,550.0 | 5,550.0 | 5,526.3 | 5,524.7 | 12.4 | 11.5 | -74.73 | 132.4 | -484.7 | 502.4 | 478.7 | 23.74 | 21.159 | |
| 5,580.0 | 5,580.0 | 5,556.3 | 5,554.7 | 12.4 | 11.6 | -74.70 | 132.6 | -484.7 | 502.5 | 478.6 | 23.88 | 21.046 | |
| 5,600.0 | 5,600.0 | 5,576.4 | 5,574.7 | 12.5 | 11.6 | -74.68 | 132.8 | -484.7 | 502.5 | 478.6 | 23.96 | 20.971 | |
| 5,610.0 | 5,610.0 | 5,586.4 | 5,584.8 | 12.5 | 11.6 | -74.67 | 132.8 | -484.7 | 502.5 | 478.5 | 24.01 | 20.934 | |
| 5,640.0 | 5,640.0 | 5,616.4 | 5,614.8 | 12.6 | 11.7 | -74.65 | 133.1 | -484.7 | 502.6 | 478.5 | 24.14 | 20.823 | |
| 5,670.0 | 5,670.0 | 5,646.5 | 5,644.9 | 12.7 | 11.7 | -74.62 | 133.3 | -484.7 | 502.7 | 478.4 | 24.27 | 20.714 | |
| 5,700.0 | 5,700.0 | 5,675.7 | 5,674.0 | 12.7 | 11.8 | -74.59 | 133.6 | -484.7 | 502.7 | 478.3 | 24.40 | 20.608 | |
| 5,730.0 | 5,730.0 | 5,704.7 | 5,703.1 | 12.8 | 11.9 | -74.54 | 134.1 | -484.7 | 502.9 | 478.3 | 24.52 | 20.506 | |
| 5,760.0 | 5,760.0 | 5,734.0 | 5,732.3 | 12.9 | 11.9 | -74.46 | 134.7 | -484.7 | 503.1 | 478.4 | 24.65 | 20.407 | |
| 5,790.0 | 5,790.0 | 5,763.4 | 5,761.8 | 12.9 | 12.0 | -74.37 | 135.6 | -484.7 | 503.3 | 478.5 | 24.78 | 20.310 | |
| 5,800.0 | 5,800.0 | 5,773.3 | 5,771.6 | 12.9 | 12.0 | -74.34 | 135.9 | -484.7 | 503.4 | 478.5 | 24.82 | 20.278 | |

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

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Reference Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site Error: | 1.0 usft | North Reference: | Grid |
| Reference Well: | War Horse Federal Com #3H | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 1.0 usft | Output errors are at | 2.00 sigma |
| Reference Wellbore | War Horse Fed Com #3H | Database: | EDM 5000.1 Single User Db |
| Reference Design: | 121123 War Horse Federal Com 3H | Offset TVD Reference: | Offset Datum |

Offset Design: Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — Offset Site Error: 0.0 usft

Survey Program: 281-MWD — Offset Well Error: 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 5,820.0 | 5,820.0 | 5,792.9 | 5,791.2 | 13.0 | 12.1 | -74.27 | 136.5 | -484.7 | 503.5 | 478.6 | 24.91 | 20.215 | |
| 5,850.0 | 5,850.0 | 5,823.1 | 5,821.4 | 13.1 | 12.1 | -74.16 | 137.5 | -484.7 | 503.8 | 478.8 | 25.04 | 20.121 | |
| 5,880.0 | 5,880.0 | 5,853.7 | 5,852.0 | 13.1 | 12.2 | -74.06 | 138.4 | -484.7 | 504.1 | 478.9 | 25.17 | 20.026 | |
| 5,900.0 | 5,900.0 | 5,874.2 | 5,872.5 | 13.2 | 12.2 | -74.00 | 138.9 | -484.7 | 504.2 | 478.9 | 25.26 | 19.962 | |
| 5,910.0 | 5,910.0 | 5,884.4 | 5,882.7 | 13.2 | 12.2 | -73.98 | 139.2 | -484.7 | 504.3 | 479.0 | 25.30 | 19.929 | |
| 5,940.0 | 5,940.0 | 5,915.1 | 5,913.4 | 13.3 | 12.3 | -73.91 | 139.8 | -484.7 | 504.4 | 479.0 | 25.43 | 19.833 | |
| 5,970.0 | 5,970.0 | 5,945.5 | 5,943.8 | 13.3 | 12.4 | -73.86 | 140.3 | -484.7 | 504.6 | 479.0 | 25.57 | 19.736 | |
| 6,000.0 | 6,000.0 | 5,976.0 | 5,974.3 | 13.4 | 12.4 | -73.82 | 140.6 | -484.7 | 504.7 | 479.0 | 25.70 | 19.639 | |
| 6,030.0 | 6,030.0 | 6,006.2 | 6,004.5 | 13.5 | 12.5 | -73.79 | 140.9 | -484.7 | 504.7 | 478.9 | 25.83 | 19.542 | |
| 6,060.0 | 6,060.0 | 6,035.9 | 6,034.2 | 13.5 | 12.6 | -73.75 | 141.2 | -484.7 | 504.8 | 478.9 | 25.96 | 19.448 | |
| 6,090.0 | 6,090.0 | 6,065.7 | 6,063.9 | 13.6 | 12.6 | -73.71 | 141.6 | -484.7 | 504.9 | 478.8 | 26.09 | 19.356 | |
| 6,100.0 | 6,100.0 | 6,075.6 | 6,073.9 | 13.6 | 12.6 | -73.70 | 141.7 | -484.7 | 505.0 | 478.8 | 26.13 | 19.325 | |
| 6,120.0 | 6,120.0 | 6,095.4 | 6,093.7 | 13.7 | 12.7 | -73.67 | 142.0 | -484.7 | 505.0 | 478.8 | 26.22 | 19.265 | |
| 6,150.0 | 6,150.0 | 6,125.3 | 6,123.5 | 13.7 | 12.8 | -73.62 | 142.5 | -484.7 | 505.2 | 478.8 | 26.34 | 19.175 | |
| 6,180.0 | 6,180.0 | 6,155.1 | 6,153.4 | 13.8 | 12.8 | -73.57 | 143.0 | -484.7 | 505.3 | 478.8 | 26.47 | 19.087 | |
| 6,200.0 | 6,200.0 | 6,175.0 | 6,173.2 | 13.8 | 12.9 | -73.53 | 143.3 | -484.7 | 505.4 | 478.8 | 26.56 | 19.029 | |
| 6,210.0 | 6,210.0 | 6,184.9 | 6,183.2 | 13.9 | 12.9 | -163.51 | 143.5 | -484.7 | 505.5 | 478.8 | 26.72 | 18.915 | |
| 6,240.0 | 6,240.0 | 6,214.7 | 6,213.0 | 13.9 | 12.9 | -163.46 | 144.0 | -484.7 | 506.1 | 479.2 | 26.84 | 18.852 | |
| 6,270.0 | 6,270.0 | 6,244.4 | 6,242.6 | 14.0 | 13.0 | -163.41 | 144.7 | -484.7 | 507.2 | 480.2 | 26.96 | 18.813 | |
| 6,300.0 | 6,299.9 | 6,274.0 | 6,272.3 | 14.1 | 13.1 | -163.37 | 145.3 | -484.7 | 508.8 | 481.7 | 27.07 | 18.798 | |
| 6,330.0 | 6,329.9 | 6,303.6 | 6,301.8 | 14.1 | 13.1 | -163.33 | 146.1 | -484.7 | 510.9 | 483.7 | 27.16 | 18.808 | |
| 6,360.0 | 6,359.8 | 6,333.2 | 6,331.4 | 14.2 | 13.2 | -163.30 | 146.9 | -484.7 | 513.5 | 486.3 | 27.26 | 18.842 | |
| 6,390.0 | 6,389.6 | 6,362.7 | 6,360.9 | 14.2 | 13.3 | -163.27 | 147.8 | -484.7 | 516.7 | 489.4 | 27.34 | 18.898 | |
| 6,400.0 | 6,399.6 | 6,372.5 | 6,370.7 | 14.3 | 13.3 | -163.26 | 148.1 | -484.7 | 517.9 | 490.5 | 27.37 | 18.922 | |
| 6,420.0 | 6,419.4 | 6,392.1 | 6,390.3 | 14.3 | 13.3 | -163.25 | 148.7 | -484.7 | 520.4 | 492.9 | 27.42 | 18.977 | |
| 6,450.0 | 6,449.1 | 6,421.2 | 6,419.4 | 14.4 | 13.4 | -163.22 | 149.8 | -484.7 | 524.6 | 497.1 | 27.49 | 19.079 | |
| 6,480.0 | 6,478.8 | 6,451.5 | 6,449.7 | 14.4 | 13.4 | -163.21 | 150.8 | -484.7 | 529.3 | 501.7 | 27.56 | 19.201 | |
| 6,501.5 | 6,500.0 | 6,473.2 | 6,471.4 | 14.5 | 13.5 | -163.22 | 151.5 | -484.7 | 532.9 | 505.3 | 27.61 | 19.300 | |
| 6,510.0 | 6,508.4 | 6,481.8 | 6,479.9 | 14.5 | 13.5 | -163.27 | 151.7 | -484.7 | 534.3 | 506.7 | 27.69 | 19.300 | |
| 6,540.0 | 6,538.0 | 6,512.1 | 6,510.3 | 14.5 | 13.6 | -163.42 | 152.5 | -484.7 | 538.6 | 510.7 | 27.93 | 19.287 | |
| 6,550.0 | 6,548.0 | 6,522.3 | 6,520.4 | 14.6 | 13.6 | -163.46 | 152.7 | -484.7 | 539.8 | 511.8 | 28.00 | 19.278 | |
| 6,570.0 | 6,567.9 | 6,542.7 | 6,540.8 | 14.6 | 13.6 | -163.52 | 153.2 | -484.7 | 541.7 | 513.5 | 28.14 | 19.252 | |
| 6,600.0 | 6,597.8 | 6,572.8 | 6,571.0 | 14.7 | 13.7 | -163.56 | 153.7 | -484.7 | 543.5 | 515.2 | 28.31 | 19.199 | |
| 6,630.0 | 6,627.8 | 6,602.8 | 6,600.9 | 14.7 | 13.8 | 16.47 | 154.2 | -484.7 | 544.1 | 515.7 | 28.44 | 19.129 | |
| 6,649.0 | 6,646.8 | 6,621.8 | 6,619.9 | 14.8 | 13.8 | 16.52 | 154.6 | -484.7 | 543.9 | 515.4 | 28.51 | 19.075 | |
| 6,660.0 | 6,657.8 | 6,632.8 | 6,630.9 | 14.8 | 13.8 | 16.54 | 154.7 | -484.7 | 543.6 | 515.0 | 28.56 | 19.035 | |
| 6,690.0 | 6,687.8 | 6,662.8 | 6,660.9 | 14.8 | 13.9 | 16.63 | 155.3 | -484.7 | 542.8 | 514.2 | 28.68 | 18.928 | |
| 6,700.0 | 6,697.8 | 6,672.8 | 6,670.9 | 14.9 | 13.9 | 16.65 | 155.4 | -484.7 | 542.6 | 513.9 | 28.72 | 18.893 | |
| 6,720.0 | 6,717.8 | 6,692.8 | 6,690.9 | 14.9 | 14.0 | 16.71 | 155.8 | -484.7 | 542.1 | 513.3 | 28.80 | 18.822 | |
| 6,750.0 | 6,747.8 | 6,722.8 | 6,720.9 | 15.0 | 14.0 | 16.79 | 156.3 | -484.7 | 541.3 | 512.4 | 28.92 | 18.717 | |
| 6,780.0 | 6,777.8 | 6,752.7 | 6,750.8 | 15.0 | 14.1 | 16.87 | 156.8 | -484.7 | 540.6 | 511.5 | 29.04 | 18.613 | |
| 6,800.0 | 6,797.8 | 6,772.5 | 6,770.6 | 15.0 | 14.1 | 16.93 | 157.2 | -484.7 | 540.1 | 511.0 | 29.12 | 18.545 | |
| 6,810.0 | 6,807.8 | 6,782.5 | 6,780.6 | 15.1 | 14.1 | 16.96 | 157.4 | -484.7 | 539.9 | 510.7 | 29.16 | 18.510 | |
| 6,840.0 | 6,837.7 | 6,812.3 | 6,810.3 | 15.1 | 14.2 | 17.04 | 158.0 | -484.7 | 539.1 | 509.8 | 29.29 | 18.409 | |
| 6,870.0 | 6,867.7 | 6,842.0 | 6,840.1 | 15.2 | 14.3 | 17.14 | 158.6 | -484.7 | 538.4 | 509.0 | 29.41 | 18.308 | |
| 6,900.0 | 6,897.7 | 6,871.8 | 6,869.9 | 15.2 | 14.3 | 17.23 | 159.3 | -484.7 | 537.7 | 508.2 | 29.53 | 18.209 | |
| 6,930.0 | 6,927.7 | 6,901.7 | 6,899.7 | 15.3 | 14.4 | 17.33 | 159.9 | -484.7 | 537.0 | 507.4 | 29.65 | 18.110 | |
| 6,960.0 | 6,957.7 | 6,931.5 | 6,929.6 | 15.4 | 14.5 | 17.43 | 160.7 | -484.7 | 536.3 | 506.6 | 29.78 | 18.013 | |
| 6,990.0 | 6,987.7 | 6,961.4 | 6,959.4 | 15.4 | 14.5 | 17.54 | 161.4 | -484.7 | 535.7 | 505.8 | 29.90 | 17.916 | |
| 7,000.0 | 6,997.7 | 6,971.3 | 6,969.4 | 15.4 | 14.5 | 17.58 | 161.6 | -484.7 | 535.4 | 505.5 | 29.94 | 17.884 | |
| 7,020.0 | 7,017.7 | 6,991.2 | 6,989.2 | 15.5 | 14.6 | 17.65 | 162.2 | -484.7 | 535.0 | 505.0 | 30.02 | 17.821 | |
| 7,043.6 | 7,041.2 | 7,014.7 | 7,012.7 | 15.5 | 14.6 | 17.73 | 162.8 | -484.7 | 534.5 | 504.4 | 30.12 | 17.746 | |

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

| | | | |
|---|---|---|---|
| **Company:** | Murchison Oil and Gas | **Local Co-ordinate Reference:** | Well War Horse Federal Com #3H |
| **Project:** | Mustang | **TVD Reference:** | WELL @ 3495.2usft (Original Well Elev) |
| **Reference Site:** | Mustang Section 21 | **MD Reference:** | WELL @ 3495.2usft (Original Well Elev) |
| **Site Error:** | 1.0 usft | **North Reference:** | Grid |
| **Reference Well:** | War Horse Federal Com #3H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 1.0 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | War Horse Fed Com #3H | **Database:** | EDM 5000.1 Single User Db |
| **Reference Design:** | 121123 War Horse Federal Com 3H | **Offset TVD Reference:** | Offset Datum |

**Offset Design** Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — Offset Site Error: 1.0 usft

**Survey Program:** 281-MWD — Offset Well Error: 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 7,050.0 | 7,047.6 | 7,021.1 | 7,019.2 | 15.5 | 14.7 | 17.76 | 162.9 | -484.7 | 534.3 | 504.2 | 30.14 | 17.729 | |
| 7,080.0 | 7,077.6 | 7,051.1 | 7,049.1 | 15.6 | 14.7 | 17.94 | 163.7 | -484.7 | 532.8 | 502.6 | 30.21 | 17.636 | |
| 7,100.0 | 7,097.5 | 7,071.0 | 7,069.0 | 15.6 | 14.8 | 18.10 | 164.2 | -484.7 | 531.1 | 500.9 | 30.24 | 17.564 | |
| 7,110.0 | 7,107.4 | 7,080.9 | 7,078.9 | 15.7 | 14.8 | 18.19 | 164.5 | -484.7 | 530.1 | 499.9 | 30.25 | 17.525 | |
| 7,140.0 | 7,137.1 | 7,110.6 | 7,108.6 | 15.7 | 14.8 | 18.52 | 165.3 | -484.7 | 526.2 | 496.0 | 30.25 | 17.395 | |
| 7,150.0 | 7,146.9 | 7,120.4 | 7,118.4 | 15.7 | 14.9 | 18.65 | 165.5 | -484.7 | 524.7 | 494.4 | 30.25 | 17.348 | |
| 7,170.0 | 7,166.6 | 7,140.0 | 7,138.0 | 15.8 | 14.9 | 18.93 | 166.1 | -484.7 | 521.2 | 491.0 | 30.22 | 17.246 | |
| 7,200.0 | 7,195.8 | 7,169.2 | 7,167.2 | 15.8 | 15.0 | 19.42 | 166.8 | -484.7 | 515.0 | 484.8 | 30.16 | 17.077 | |
| 7,230.0 | 7,224.7 | 7,198.1 | 7,196.1 | 15.9 | 15.0 | 20.01 | 167.6 | -484.7 | 507.7 | 477.6 | 30.06 | 16.887 | |
| 7,250.0 | 7,243.8 | 7,217.2 | 7,215.2 | 16.0 | 15.1 | 20.46 | 168.1 | -484.7 | 502.2 | 472.2 | 29.98 | 16.747 | |
| 7,260.0 | 7,253.2 | 7,226.7 | 7,224.6 | 16.0 | 15.1 | 20.70 | 168.3 | -484.7 | 499.2 | 469.3 | 29.94 | 16.673 | |
| 7,290.0 | 7,281.4 | 7,254.8 | 7,252.7 | 16.0 | 15.2 | 21.50 | 169.1 | -484.7 | 489.7 | 459.9 | 29.80 | 16.435 | |
| 7,300.0 | 7,290.7 | 7,264.0 | 7,262.0 | 16.1 | 15.2 | 21.79 | 169.3 | -484.7 | 486.3 | 456.5 | 29.74 | 16.349 | |
| 7,320.0 | 7,309.0 | 7,282.4 | 7,280.3 | 16.1 | 15.2 | 22.43 | 169.8 | -484.7 | 479.1 | 449.5 | 29.63 | 16.169 | |
| 7,350.0 | 7,336.2 | 7,309.5 | 7,307.4 | 16.2 | 15.3 | 23.50 | 170.5 | -484.7 | 467.5 | 438.0 | 29.45 | 15.873 | |
| 7,380.0 | 7,362.8 | 7,336.0 | 7,333.9 | 16.3 | 15.3 | 24.73 | 171.2 | -484.7 | 454.9 | 425.6 | 29.26 | 15.543 | |
| 7,400.0 | 7,380.2 | 7,353.4 | 7,351.3 | 16.3 | 15.4 | 25.64 | 171.7 | -484.7 | 445.9 | 416.8 | 29.14 | 15.303 | |
| 7,410.0 | 7,388.8 | 7,361.9 | 7,359.9 | 16.4 | 15.4 | 26.14 | 171.9 | -484.7 | 441.3 | 412.2 | 29.08 | 15.176 | |
| 7,440.0 | 7,414.2 | 7,387.3 | 7,385.2 | 16.5 | 15.4 | 27.75 | 172.6 | -484.7 | 426.9 | 398.0 | 28.91 | 14.765 | |
| 7,450.0 | 7,422.5 | 7,395.7 | 7,393.6 | 16.5 | 15.5 | 28.34 | 172.9 | -484.7 | 421.9 | 393.0 | 28.86 | 14.618 | |
| 7,470.0 | 7,438.8 | 7,412.2 | 7,410.1 | 16.6 | 15.5 | 29.61 | 173.3 | -484.7 | 411.6 | 382.8 | 28.77 | 14.305 | |
| 7,500.0 | 7,462.8 | 7,436.4 | 7,434.2 | 16.7 | 15.5 | 31.72 | 173.9 | -484.7 | 395.5 | 366.8 | 28.68 | 13.791 | |
| 7,530.0 | 7,485.9 | 7,459.6 | 7,457.5 | 16.8 | 15.6 | 34.12 | 174.5 | -484.7 | 378.7 | 350.1 | 28.65 | 13.218 | |
| 7,550.0 | 7,500.9 | 7,474.7 | 7,472.6 | 16.9 | 15.6 | 35.90 | 174.9 | -484.7 | 367.2 | 338.5 | 28.68 | 12.803 | |
| 7,560.0 | 7,508.2 | 7,482.1 | 7,479.9 | 17.0 | 15.6 | 36.85 | 175.0 | -484.7 | 361.3 | 332.6 | 28.71 | 12.584 | |
| 7,583.6 | 7,525.2 | 7,499.1 | 7,497.0 | 17.1 | 15.7 | 39.25 | 175.4 | -484.7 | 347.2 | 318.4 | 28.84 | 12.041 | |
| 7,590.0 | 7,529.7 | 7,503.6 | 7,501.5 | 17.1 | 15.7 | 39.93 | 175.5 | -484.7 | 343.4 | 314.5 | 28.89 | 11.888 | |
| 7,600.0 | 7,536.6 | 7,510.6 | 7,508.5 | 17.2 | 15.7 | 41.04 | 175.7 | -484.7 | 337.3 | 308.4 | 28.97 | 11.643 | |
| 7,620.0 | 7,550.3 | 7,524.3 | 7,522.2 | 17.3 | 15.7 | 43.38 | 176.0 | -484.7 | 325.1 | 295.9 | 29.20 | 11.134 | |
| 7,650.0 | 7,569.9 | 7,544.0 | 7,541.9 | 17.5 | 15.8 | 47.23 | 176.4 | -484.7 | 306.5 | 276.8 | 29.65 | 10.337 | |
| 7,680.0 | 7,588.6 | 7,562.8 | 7,560.6 | 17.7 | 15.8 | 51.46 | 176.8 | -484.7 | 287.9 | 257.6 | 30.26 | 9.512 | |
| 7,700.0 | 7,600.5 | 7,574.7 | 7,572.6 | 17.9 | 15.8 | 54.48 | 177.1 | -484.7 | 275.5 | 244.8 | 30.74 | 8.962 | |
| 7,710.0 | 7,606.2 | 7,580.6 | 7,578.4 | 18.0 | 15.8 | 56.04 | 177.2 | -484.7 | 269.4 | 238.4 | 31.00 | 8.688 | |
| 7,740.0 | 7,622.9 | 7,597.3 | 7,595.1 | 18.3 | 15.9 | 60.88 | 177.5 | -484.7 | 251.3 | 219.5 | 31.84 | 7.892 | |
| 7,750.0 | 7,628.2 | 7,602.6 | 7,600.5 | 18.4 | 15.9 | 62.54 | 177.6 | -484.7 | 245.5 | 213.3 | 32.13 | 7.639 | |
| 7,770.0 | 7,638.5 | 7,613.0 | 7,610.8 | 18.6 | 15.9 | 65.88 | 177.8 | -484.7 | 234.1 | 201.3 | 32.73 | 7.151 | |
| 7,800.0 | 7,652.9 | 7,627.5 | 7,625.4 | 18.9 | 15.9 | 70.86 | 178.1 | -484.7 | 218.1 | 184.5 | 33.60 | 6.491 | |
| 7,830.0 | 7,666.3 | 7,641.0 | 7,638.8 | 19.2 | 16.0 | 75.66 | 178.4 | -484.7 | 203.9 | 169.5 | 34.41 | 5.926 | |
| 7,850.0 | 7,674.6 | 7,649.3 | 7,647.2 | 19.5 | 16.0 | 78.68 | 178.5 | -484.7 | 195.8 | 160.9 | 34.89 | 5.613 | |
| 7,860.0 | 7,678.6 | 7,653.3 | 7,651.1 | 19.6 | 16.0 | 80.12 | 178.6 | -484.7 | 192.3 | 157.1 | 35.12 | 5.474 | |
| 7,890.0 | 7,689.7 | 7,664.5 | 7,662.3 | 20.0 | 16.0 | 84.09 | 178.8 | -484.7 | 183.8 | 148.1 | 35.74 | 5.144 | |
| 7,894.9 | 7,691.3 | 7,666.2 | 7,664.0 | 20.1 | 16.0 | 84.68 | 178.8 | -484.7 | 182.8 | 147.0 | 35.82 | 5.103 | |
| 7,900.0 | 7,693.1 | 7,667.9 | 7,665.8 | 20.1 | 16.0 | 85.21 | 178.9 | -484.7 | 181.8 | 145.9 | 35.92 | 5.063 | |
| 7,920.0 | 7,700.0 | 7,674.8 | 7,672.6 | 20.4 | 16.0 | 87.27 | 179.0 | -484.7 | 179.3 | 143.0 | 36.28 | 4.943 | |
| 7,936.0 | 7,705.5 | 7,680.3 | 7,678.1 | 20.7 | 16.1 | 88.91 | 179.1 | -484.7 | 178.7 | 142.1 | 36.54 | 4.890 | CC, ES |
| 7,950.0 | 7,710.3 | 7,685.0 | 7,682.9 | 20.9 | 16.1 | 90.35 | 179.2 | -484.7 | 179.2 | 142.4 | 36.76 | 4.874 | SF |
| 7,980.0 | 7,720.6 | 7,695.3 | 7,693.1 | 21.3 | 16.1 | 93.42 | 179.3 | -484.7 | 183.4 | 146.2 | 37.17 | 4.934 | |
| 8,000.0 | 7,727.5 | 7,702.1 | 7,699.9 | 21.6 | 16.1 | 95.46 | 179.5 | -484.7 | 188.5 | 151.1 | 37.40 | 5.041 | |
| 8,010.0 | 7,730.9 | 7,705.5 | 7,703.3 | 21.8 | 16.1 | 96.47 | 179.5 | -484.7 | 191.7 | 154.2 | 37.52 | 5.111 | |
| 8,040.0 | 7,741.2 | 7,715.7 | 7,713.6 | 22.3 | 16.1 | 99.48 | 179.7 | -484.7 | 203.7 | 165.8 | 37.82 | 5.385 | |
| 8,046.8 | 7,743.5 | 7,718.1 | 7,715.9 | 22.4 | 16.1 | 100.14 | 179.8 | -484.7 | 206.8 | 168.9 | 37.87 | 5.460 | |
| 8,050.0 | 7,744.6 | 7,719.2 | 7,717.0 | 22.5 | 16.1 | 100.33 | 179.8 | -484.7 | 208.3 | 170.4 | 37.91 | 5.495 | |

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

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Reference Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site Error: | 1.0 usft | North Reference: | Grid |
| Reference Well: | War Horse Federal Com #3H | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 1.0 usft | Output errors are at | 2.00 sigma |
| Reference Wellbore | War Horse Fed Com #3H | Database: | EDM 5000.1 Single User Db |
| Reference Design: | 121123 War Horse Federal Com 3H | Offset TVD Reference: | Offset Datum |

Offset Design: Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — Offset Site Error: 0.0 usft

Survey Program: 281-MWD — Offset Well Error: 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 8,070.0 | 7,751.2 | 7,725.6 | 7,723.4 | 22.8 | 16.2 | 101.27 | 179.9 | -484.7 | 218.7 | 180.5 | 38.17 | 5.728 | |
| 8,100.0 | 7,760.0 | 7,734.4 | 7,732.2 | 23.3 | 16.2 | 102.12 | 180.1 | -484.7 | 236.4 | 197.8 | 38.60 | 6.124 | |
| 8,130.0 | 7,767.5 | 7,741.9 | 7,739.7 | 23.9 | 16.2 | 102.27 | 180.2 | -484.7 | 256.3 | 217.2 | 39.13 | 6.551 | |
| 8,150.0 | 7,771.9 | 7,746.2 | 7,744.0 | 24.2 | 16.2 | 101.96 | 180.3 | -484.7 | 270.7 | 231.2 | 39.53 | 6.848 | |
| 8,160.0 | 7,773.9 | 7,748.2 | 7,746.0 | 24.4 | 16.2 | 101.68 | 180.4 | -484.7 | 278.1 | 238.4 | 39.75 | 6.997 | |
| 8,190.0 | 7,779.0 | 7,753.3 | 7,751.1 | 25.0 | 16.2 | 100.35 | 180.5 | -484.7 | 301.4 | 260.9 | 40.47 | 7.447 | |
| 8,200.0 | 7,780.5 | 7,754.7 | 7,752.5 | 25.2 | 16.2 | 99.73 | 180.5 | -484.7 | 309.4 | 268.7 | 40.72 | 7.598 | |
| 8,220.0 | 7,782.9 | 7,757.1 | 7,754.9 | 25.6 | 16.2 | 98.22 | 180.6 | -484.7 | 325.8 | 284.6 | 41.26 | 7.896 | |
| 8,250.0 | 7,785.6 | 7,759.7 | 7,757.6 | 26.2 | 16.2 | 95.27 | 180.6 | -484.7 | 351.2 | 309.1 | 42.08 | 8.346 | |
| 8,280.0 | 7,786.9 | 7,761.1 | 7,758.9 | 26.8 | 16.2 | 91.47 | 180.6 | -484.7 | 377.3 | 334.5 | 42.86 | 8.805 | |
| 8,300.0 | 7,787.2 | 7,761.3 | 7,759.2 | 27.3 | 16.2 | 88.47 | 180.6 | -484.7 | 395.1 | 351.8 | 43.29 | 9.126 | |
| 8,310.0 | 7,787.1 | 7,761.2 | 7,759.1 | 27.5 | 16.2 | 86.83 | 180.6 | -484.7 | 404.0 | 360.6 | 43.47 | 9.294 | |
| 8,314.0 | 7,787.0 | 7,761.2 | 7,759.0 | 27.6 | 16.2 | 86.16 | 180.6 | -484.7 | 407.6 | 364.0 | 43.53 | 9.363 | |
| 8,340.0 | 7,786.4 | 7,760.6 | 7,758.4 | 28.1 | 16.2 | 85.98 | 180.6 | -484.7 | 431.1 | 387.1 | 44.09 | 9.780 | |
| 8,370.0 | 7,785.8 | 7,759.9 | 7,757.7 | 28.8 | 16.2 | 85.77 | 180.6 | -484.7 | 458.6 | 413.9 | 44.72 | 10.255 | |
| 8,400.0 | 7,785.1 | 7,759.3 | 7,757.1 | 29.4 | 16.2 | 85.55 | 180.6 | -484.7 | 486.4 | 441.0 | 45.36 | 10.724 | |
| 8,430.0 | 7,784.4 | 7,758.6 | 7,756.4 | 30.1 | 16.2 | 85.34 | 180.6 | -484.7 | 514.4 | 468.4 | 46.02 | 11.179 | |
| 8,460.0 | 7,783.8 | 7,757.9 | 7,755.7 | 30.8 | 16.2 | 85.13 | 180.6 | -484.7 | 542.6 | 496.0 | 46.68 | 11.626 | |
| 8,490.0 | 7,783.1 | 7,757.3 | 7,755.1 | 31.4 | 16.2 | 84.92 | 180.6 | -484.7 | 571.1 | 523.7 | 47.33 | 12.065 | |
| 8,500.0 | 7,782.9 | 7,757.1 | 7,754.9 | 31.7 | 16.2 | 84.85 | 180.6 | -484.7 | 580.6 | 533.0 | 47.55 | 12.209 | |
| 8,520.0 | 7,782.4 | 7,756.6 | 7,754.4 | 32.1 | 16.2 | 84.70 | 180.6 | -484.7 | 599.6 | 551.6 | 48.01 | 12.491 | |
| 8,550.0 | 7,781.8 | 7,755.9 | 7,753.8 | 32.8 | 16.2 | 84.49 | 180.5 | -484.7 | 628.3 | 579.6 | 48.68 | 12.906 | |
| 8,580.0 | 7,781.1 | 7,755.3 | 7,753.1 | 33.5 | 16.2 | 84.28 | 180.5 | -484.7 | 657.1 | 607.8 | 49.36 | 13.313 | |
| 8,600.0 | 7,780.7 | 7,754.8 | 7,752.6 | 34.0 | 16.2 | 84.14 | 180.5 | -484.7 | 676.4 | 626.6 | 49.81 | 13.579 | |
| 8,610.0 | 7,780.4 | 7,754.6 | 7,752.4 | 34.2 | 16.2 | 84.07 | 180.5 | -484.7 | 686.1 | 636.0 | 50.05 | 13.709 | |
| 8,640.0 | 7,779.8 | 7,754.0 | 7,751.8 | 34.9 | 16.2 | 83.86 | 180.5 | -484.7 | 715.1 | 664.3 | 50.74 | 14.093 | |
| 8,670.0 | 7,779.1 | 7,753.3 | 7,751.1 | 35.6 | 16.2 | 83.65 | 180.5 | -484.7 | 744.1 | 692.7 | 51.43 | 14.469 | |
| 8,700.0 | 7,778.4 | 7,752.6 | 7,750.4 | 36.4 | 16.2 | 83.43 | 180.5 | -484.7 | 773.3 | 721.2 | 52.12 | 14.836 | |
| 8,730.0 | 7,777.8 | 7,752.0 | 7,749.8 | 37.1 | 16.2 | 83.22 | 180.5 | -484.7 | 802.5 | 749.7 | 52.83 | 15.191 | |
| 8,760.0 | 7,777.1 | 7,751.3 | 7,749.1 | 37.8 | 16.2 | 83.01 | 180.4 | -484.7 | 831.8 | 778.2 | 53.53 | 15.538 | |
| 8,790.0 | 7,776.5 | 7,750.6 | 7,748.4 | 38.5 | 16.2 | 82.80 | 180.4 | -484.7 | 861.1 | 806.9 | 54.23 | 15.877 | |
| 8,800.0 | 7,776.2 | 7,750.4 | 7,748.2 | 38.8 | 16.2 | 82.73 | 180.4 | -484.7 | 870.9 | 816.4 | 54.47 | 15.989 | |
| 8,820.0 | 7,775.8 | 7,750.0 | 7,747.8 | 39.3 | 16.2 | 82.59 | 180.4 | -484.7 | 890.5 | 835.5 | 54.94 | 16.207 | |
| 8,850.0 | 7,775.1 | 7,749.3 | 7,747.1 | 40.0 | 16.2 | 82.38 | 180.4 | -484.7 | 919.9 | 864.2 | 55.66 | 16.528 | |
| 8,880.0 | 7,774.5 | 7,748.6 | 7,746.5 | 40.8 | 16.2 | 82.17 | 180.4 | -484.7 | 949.3 | 892.9 | 56.37 | 16.841 | |
| 8,900.0 | 7,774.0 | 7,748.2 | 7,746.0 | 41.3 | 16.2 | 82.03 | 180.4 | -484.7 | 969.0 | 912.1 | 56.84 | 17.047 | |
| 8,910.0 | 7,773.8 | 7,748.0 | 7,745.8 | 41.5 | 16.2 | 81.96 | 180.4 | -484.7 | 978.8 | 921.7 | 57.08 | 17.147 | |
| 8,940.0 | 7,773.1 | 7,747.3 | 7,745.1 | 42.3 | 16.2 | 81.75 | 180.4 | -484.7 | 1,008.3 | 950.5 | 57.80 | 17.445 | |
| 8,970.0 | 7,772.5 | 7,746.7 | 7,744.5 | 43.0 | 16.2 | 81.54 | 180.3 | -484.7 | 1,037.8 | 979.3 | 58.52 | 17.736 | |
| 9,000.0 | 7,771.8 | 7,746.0 | 7,743.8 | 43.8 | 16.2 | 81.33 | 180.3 | -484.7 | 1,067.4 | 1,008.2 | 59.23 | 18.020 | |
| 9,030.0 | 7,771.1 | 7,745.3 | 7,743.1 | 44.5 | 16.2 | 81.12 | 180.3 | -484.7 | 1,097.0 | 1,037.0 | 59.95 | 18.297 | |
| 9,060.0 | 7,770.5 | 7,744.7 | 7,742.5 | 45.3 | 16.2 | 80.91 | 180.3 | -484.7 | 1,126.6 | 1,065.9 | 60.68 | 18.567 | |
| 9,090.0 | 7,769.8 | 7,744.0 | 7,741.8 | 46.0 | 16.2 | 80.70 | 180.3 | -484.7 | 1,156.2 | 1,094.8 | 61.40 | 18.832 | |
| 9,100.0 | 7,769.6 | 7,743.8 | 7,741.6 | 46.3 | 16.2 | 80.63 | 180.3 | -484.7 | 1,166.1 | 1,104.4 | 61.64 | 18.919 | |
| 9,120.0 | 7,769.1 | 7,743.3 | 7,741.1 | 46.8 | 16.2 | 80.49 | 180.3 | -484.7 | 1,185.8 | 1,123.7 | 62.12 | 19.090 | |
| 9,150.0 | 7,768.5 | 7,742.7 | 7,740.5 | 47.6 | 16.2 | 80.28 | 180.3 | -484.7 | 1,215.5 | 1,152.7 | 62.84 | 19.342 | |
| 9,180.0 | 7,767.8 | 7,742.0 | 7,739.8 | 48.3 | 16.2 | 80.07 | 180.2 | -484.7 | 1,245.2 | 1,181.6 | 63.56 | 19.589 | |
| 9,200.0 | 7,767.4 | 7,741.6 | 7,739.4 | 48.8 | 16.2 | 79.93 | 180.2 | -484.7 | 1,265.0 | 1,200.9 | 64.05 | 19.751 | |
| 9,210.0 | 7,767.2 | 7,741.3 | 7,739.2 | 49.1 | 16.2 | 79.87 | 180.2 | -484.7 | 1,274.9 | 1,210.6 | 64.29 | 19.831 | |
| 9,240.0 | 7,766.5 | 7,740.7 | 7,738.5 | 49.9 | 16.2 | 79.66 | 180.2 | -484.7 | 1,304.6 | 1,239.6 | 65.01 | 20.066 | |
| 9,270.0 | 7,765.8 | 7,740.0 | 7,737.8 | 50.6 | 16.2 | 79.45 | 180.2 | -484.7 | 1,334.3 | 1,268.6 | 65.74 | 20.298 | |
| 9,300.0 | 7,765.2 | 7,739.4 | 7,737.2 | 51.4 | 16.2 | 79.24 | 180.2 | -484.7 | 1,364.0 | 1,297.6 | 66.46 | 20.525 | |

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

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Reference Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site Error: | 1.0 usft | North Reference: | Grid |
| Reference Well: | War Horse Federal Com #3H | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 1.0 usft | Output errors are at | 2.00 sigma |
| Reference Wellbore | War Horse Fed Com #3H | Database: | EDM 5000.1 Single User Db |
| Reference Design: | 121123 War Horse Federal Com 3H | Offset TVD Reference: | Offset Datum |

Offset Design: Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — Offset Site Error: 0.0 usft

Survey Program: 281-MWD+ — Offset Well Error: 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 9,330.0 | 7,764.5 | 7,738.7 | 7,736.5 | 52.2 | 16.2 | 79.04 | 180.2 | -484.7 | 1,393.8 | 1,326.6 | 67.18 | 20.746 | |
| 9,360.0 | 7,763.8 | 7,738.0 | 7,735.8 | 53.0 | 16.2 | 78.83 | 180.2 | -484.7 | 1,423.5 | 1,355.6 | 67.91 | 20.963 | |
| 9,390.0 | 7,763.2 | 7,737.4 | 7,735.2 | 53.8 | 16.2 | 78.62 | 180.2 | -484.7 | 1,453.3 | 1,384.6 | 68.63 | 21.176 | |
| 9,400.0 | 7,762.9 | 7,737.1 | 7,735.0 | 54.0 | 16.2 | 78.55 | 180.1 | -484.7 | 1,463.2 | 1,394.3 | 68.87 | 21.246 | |
| 9,420.0 | 7,762.5 | 7,736.7 | 7,734.5 | 54.5 | 16.2 | 78.42 | 180.1 | -484.7 | 1,483.0 | 1,413.7 | 69.35 | 21.384 | |
| 9,450.0 | 7,761.8 | 7,736.0 | 7,733.8 | 55.3 | 16.2 | 78.21 | 180.1 | -484.7 | 1,512.8 | 1,442.7 | 70.07 | 21.589 | |
| 9,480.0 | 7,761.2 | 7,735.4 | 7,733.2 | 56.1 | 16.2 | 78.00 | 180.1 | -484.7 | 1,542.6 | 1,471.8 | 70.80 | 21.789 | |
| 9,500.0 | 7,760.7 | 7,734.9 | 7,732.7 | 56.6 | 16.2 | 77.87 | 180.1 | -484.7 | 1,562.5 | 1,491.2 | 71.28 | 21.921 | |
| 9,510.0 | 7,760.5 | 7,734.7 | 7,732.5 | 56.9 | 16.2 | 77.80 | 180.1 | -484.7 | 1,572.4 | 1,500.9 | 71.52 | 21.987 | |
| 9,540.0 | 7,759.8 | 7,734.0 | 7,731.9 | 57.7 | 16.2 | 77.59 | 180.1 | -484.7 | 1,602.2 | 1,530.0 | 72.24 | 22.180 | |
| 9,570.0 | 7,759.2 | 7,733.4 | 7,731.2 | 58.5 | 16.2 | 77.39 | 180.1 | -484.7 | 1,632.0 | 1,559.1 | 72.96 | 22.369 | |
| 9,600.0 | 7,758.5 | 7,732.7 | 7,730.5 | 59.2 | 16.2 | 77.18 | 180.1 | -484.7 | 1,661.8 | 1,588.2 | 73.67 | 22.556 | |
| 9,630.0 | 7,757.8 | 7,732.1 | 7,729.9 | 60.0 | 16.2 | 76.98 | 180.0 | -484.7 | 1,691.7 | 1,617.3 | 74.39 | 22.739 | |
| 9,660.0 | 7,757.2 | 7,731.4 | 7,729.2 | 60.8 | 16.2 | 76.77 | 180.0 | -484.7 | 1,721.5 | 1,646.4 | 75.11 | 22.919 | |
| 9,690.0 | 7,756.5 | 7,730.7 | 7,728.5 | 61.6 | 16.2 | 76.57 | 180.0 | -484.7 | 1,751.3 | 1,675.5 | 75.83 | 23.096 | |
| 9,700.0 | 7,756.3 | 7,730.5 | 7,728.3 | 61.9 | 16.2 | 76.50 | 180.0 | -484.7 | 1,761.3 | 1,685.2 | 76.06 | 23.155 | |
| 9,720.0 | 7,755.9 | 7,730.1 | 7,727.9 | 62.4 | 16.2 | 76.37 | 180.0 | -484.7 | 1,781.2 | 1,704.6 | 76.54 | 23.270 | |
| 9,750.0 | 7,755.2 | 7,729.4 | 7,727.2 | 63.2 | 16.2 | 76.16 | 180.0 | -484.7 | 1,811.0 | 1,733.7 | 77.26 | 23.442 | |
| 9,780.0 | 7,754.5 | 7,728.7 | 7,726.6 | 64.0 | 16.2 | 75.96 | 180.0 | -484.7 | 1,840.8 | 1,762.9 | 77.97 | 23.610 | |
| 9,800.0 | 7,754.1 | 7,728.3 | 7,726.1 | 64.5 | 16.2 | 75.83 | 180.0 | -484.7 | 1,860.8 | 1,782.3 | 78.44 | 23.721 | |
| 9,810.0 | 7,753.9 | 7,728.1 | 7,725.9 | 64.8 | 16.2 | 75.76 | 180.0 | -484.7 | 1,870.7 | 1,792.0 | 78.68 | 23.776 | |
| 9,840.0 | 7,753.2 | 7,727.4 | 7,725.2 | 65.6 | 16.2 | 75.56 | 180.0 | -484.7 | 1,900.6 | 1,821.2 | 79.39 | 23.940 | |
| 9,870.0 | 7,752.5 | 7,726.7 | 7,724.6 | 66.4 | 16.2 | 75.36 | 179.9 | -484.7 | 1,930.4 | 1,850.3 | 80.10 | 24.101 | |
| 9,900.0 | 7,751.9 | 7,726.1 | 7,723.9 | 67.2 | 16.2 | 75.15 | 179.9 | -484.7 | 1,960.3 | 1,879.5 | 80.81 | 24.259 | |
| 9,930.0 | 7,751.2 | 7,725.4 | 7,723.2 | 68.0 | 16.2 | 74.95 | 179.9 | -484.7 | 1,990.2 | 1,908.6 | 81.51 | 24.416 | |
| 9,960.0 | 7,750.5 | 7,724.8 | 7,722.6 | 68.8 | 16.2 | 74.75 | 179.9 | -484.7 | 2,020.0 | 1,937.8 | 82.22 | 24.570 | |
| 9,990.0 | 7,749.9 | 7,724.1 | 7,721.9 | 69.6 | 16.1 | 74.55 | 179.9 | -484.7 | 2,049.9 | 1,967.0 | 82.92 | 24.722 | |
| 10,000.0 | 7,749.6 | 7,723.9 | 7,721.7 | 69.8 | 16.1 | 74.48 | 179.9 | -484.7 | 2,059.9 | 1,976.7 | 83.15 | 24.772 | |
| 10,020.0 | 7,749.2 | 7,723.4 | 7,721.2 | 70.4 | 16.1 | 74.35 | 179.9 | -484.7 | 2,079.8 | 1,996.2 | 83.62 | 24.872 | |
| 10,050.0 | 7,748.5 | 7,722.8 | 7,720.6 | 71.2 | 16.1 | 74.15 | 179.9 | -484.7 | 2,109.7 | 2,025.4 | 84.32 | 25.019 | |
| 10,080.0 | 7,747.9 | 7,722.1 | 7,719.9 | 72.0 | 16.1 | 73.95 | 179.9 | -484.7 | 2,139.6 | 2,054.5 | 85.02 | 25.165 | |
| 10,100.0 | 7,747.4 | 7,721.7 | 7,719.5 | 72.5 | 16.1 | 73.82 | 179.8 | -484.7 | 2,159.5 | 2,074.0 | 85.48 | 25.262 | |
| 10,110.0 | 7,747.2 | 7,721.4 | 7,719.3 | 72.8 | 16.1 | 73.75 | 179.8 | -484.7 | 2,169.5 | 2,083.7 | 85.72 | 25.310 | |
| 10,140.0 | 7,746.5 | 7,720.8 | 7,718.6 | 73.6 | 16.1 | 73.55 | 179.8 | -484.7 | 2,199.3 | 2,112.9 | 86.41 | 25.452 | |
| 10,170.0 | 7,745.9 | 7,720.1 | 7,717.9 | 74.4 | 16.1 | 73.36 | 179.8 | -484.7 | 2,229.2 | 2,142.1 | 87.11 | 25.592 | |
| 10,200.0 | 7,745.2 | 7,719.4 | 7,717.3 | 75.2 | 16.1 | 73.16 | 179.8 | -484.7 | 2,259.1 | 2,171.3 | 87.80 | 25.731 | |
| 10,230.0 | 7,744.6 | 7,718.8 | 7,716.6 | 76.0 | 16.1 | 72.96 | 179.8 | -484.7 | 2,289.0 | 2,200.6 | 88.49 | 25.868 | |
| 10,260.0 | 7,743.9 | 7,718.1 | 7,715.9 | 76.8 | 16.1 | 72.76 | 179.8 | -484.7 | 2,318.9 | 2,229.8 | 89.18 | 26.004 | |
| 10,290.0 | 7,743.2 | 7,717.5 | 7,715.3 | 77.6 | 16.1 | 72.57 | 179.8 | -484.7 | 2,348.8 | 2,259.0 | 89.86 | 26.138 | |
| 10,300.0 | 7,743.0 | 7,717.2 | 7,715.1 | 77.8 | 16.1 | 72.50 | 179.8 | -484.7 | 2,358.8 | 2,268.7 | 90.09 | 26.183 | |
| 10,320.0 | 7,742.6 | 7,716.8 | 7,714.6 | 78.4 | 16.1 | 72.37 | 179.7 | -484.7 | 2,378.8 | 2,288.2 | 90.55 | 26.271 | |
| 10,350.0 | 7,741.9 | 7,716.1 | 7,713.9 | 79.2 | 16.1 | 72.18 | 179.7 | -484.7 | 2,408.7 | 2,317.4 | 91.23 | 26.402 | |
| 10,380.0 | 7,741.2 | 7,715.5 | 7,713.3 | 80.0 | 16.1 | 71.98 | 179.7 | -484.7 | 2,438.6 | 2,346.7 | 91.91 | 26.532 | |
| 10,400.0 | 7,740.8 | 7,715.0 | 7,712.8 | 80.5 | 16.1 | 71.85 | 179.7 | -484.7 | 2,458.5 | 2,366.2 | 92.36 | 26.618 | |
| 10,410.0 | 7,740.6 | 7,714.8 | 7,712.6 | 80.8 | 16.1 | 71.79 | 179.7 | -484.7 | 2,468.5 | 2,375.9 | 92.59 | 26.661 | |
| 10,440.0 | 7,739.9 | 7,714.1 | 7,712.0 | 81.6 | 16.1 | 71.59 | 179.7 | -484.7 | 2,498.4 | 2,405.1 | 93.27 | 26.788 | |
| 10,470.0 | 7,739.2 | 7,713.5 | 7,711.3 | 82.4 | 16.1 | 71.40 | 179.7 | -484.7 | 2,528.3 | 2,434.4 | 93.94 | 26.914 | |
| 10,500.0 | 7,738.6 | 7,712.8 | 7,710.6 | 83.2 | 16.1 | 71.20 | 179.7 | -484.7 | 2,558.2 | 2,463.6 | 94.61 | 27.039 | |
| 10,530.0 | 7,737.9 | 7,712.2 | 7,710.0 | 84.0 | 16.1 | 71.01 | 179.7 | -484.7 | 2,588.2 | 2,492.9 | 95.29 | 27.162 | |
| 10,560.0 | 7,737.2 | 7,711.5 | 7,709.3 | 84.8 | 16.1 | 70.82 | 179.6 | -484.7 | 2,618.1 | 2,522.1 | 95.96 | 27.284 | |
| 10,590.0 | 7,736.6 | 7,710.8 | 7,708.6 | 85.6 | 16.1 | 70.62 | 179.6 | -484.7 | 2,648.0 | 2,551.4 | 96.62 | 27.406 | |
| 10,600.0 | 7,736.4 | 7,710.6 | 7,708.4 | 85.9 | 16.1 | 70.56 | 179.6 | -484.7 | 2,658.0 | 2,561.1 | 96.84 | 27.446 | |

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

| | | | |
|---|---|---|---|
| Company: | Murchison Oil and Gas | Local Co-ordinate Reference: | Well War Horse Federal Com #3H |
| Project: | Mustang | TVD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Reference Site: | Mustang Section 21 | MD Reference: | WELL @ 3495.2usft (Original Well Elev) |
| Site Error: | 1.0 usft | North Reference: | Grid |
| Reference Well: | War Horse Federal Com #3H | Survey Calculation Method: | Minimum Curvature |
| Well Error: | 1.0 usft | Output errors are at: | 2.00 sigma |
| Reference Wellbore | War Horse Fed Com #3H | Database: | EDM 5000.1 Single User Db |
| Reference Design: | 121123 War Horse Federal Com 3H | Offset TVD Reference: | Offset Datum |

Offset Design: Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — Offset Site Error: 0.0 usft

Survey Program: 281-MWD — Offset Well Error: 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10,620.0 | 7,735.9 | 7,710.2 | 7,708.0 | 86.4 | 16.1 | 70.43 | 179.6 | -484.7 | 2,677.9 | 2,580.6 | 97.29 | 27.526 | |
| 10,650.0 | 7,735.2 | 7,709.5 | 7,707.3 | 87.3 | 16.1 | 70.24 | 179.6 | -484.7 | 2,707.9 | 2,609.9 | 97.95 | 27.645 | |
| 10,680.0 | 7,734.6 | 7,708.8 | 7,706.7 | 88.1 | 16.1 | 70.05 | 179.6 | -484.7 | 2,737.8 | 2,639.2 | 98.61 | 27.763 | |
| 10,700.0 | 7,734.1 | 7,708.4 | 7,706.2 | 88.6 | 16.1 | 69.92 | 179.6 | -484.7 | 2,757.7 | 2,658.7 | 99.05 | 27.842 | |
| 10,710.0 | 7,733.9 | 7,708.2 | 7,706.0 | 88.9 | 16.1 | 69.86 | 179.6 | -484.7 | 2,767.7 | 2,668.4 | 99.27 | 27.881 | |
| 10,740.0 | 7,733.3 | 7,707.5 | 7,705.3 | 89.7 | 16.1 | 69.67 | 179.6 | -484.7 | 2,797.6 | 2,697.7 | 99.93 | 27.997 | |
| 10,770.0 | 7,732.6 | 7,706.8 | 7,704.7 | 90.5 | 16.1 | 69.48 | 179.6 | -484.7 | 2,827.6 | 2,727.0 | 100.58 | 28.112 | |
| 10,800.0 | 7,731.9 | 7,706.2 | 7,704.0 | 91.3 | 16.1 | 69.29 | 179.5 | -484.7 | 2,857.5 | 2,756.3 | 101.23 | 28.227 | |
| 10,830.0 | 7,731.3 | 7,705.5 | 7,703.3 | 92.1 | 16.1 | 69.10 | 179.5 | -484.7 | 2,887.4 | 2,785.6 | 101.88 | 28.341 | |
| 10,860.0 | 7,730.6 | 7,704.9 | 7,702.7 | 92.9 | 16.1 | 68.91 | 179.5 | -484.7 | 2,917.4 | 2,814.8 | 102.53 | 28.454 | |
| 10,890.0 | 7,729.9 | 7,704.2 | 7,702.0 | 93.7 | 16.1 | 68.72 | 179.5 | -484.7 | 2,947.3 | 2,844.1 | 103.18 | 28.566 | |
| 10,900.0 | 7,729.7 | 7,704.0 | 7,701.8 | 94.0 | 16.1 | 68.66 | 179.5 | -484.7 | 2,957.3 | 2,853.9 | 103.39 | 28.603 | |
| 10,920.0 | 7,729.3 | 7,703.5 | 7,701.3 | 94.5 | 16.1 | 68.54 | 179.5 | -484.7 | 2,977.3 | 2,873.4 | 103.82 | 28.677 | |
| 10,950.0 | 7,728.6 | 7,702.9 | 7,700.7 | 95.4 | 16.1 | 68.35 | 179.5 | -484.7 | 3,007.2 | 2,902.7 | 104.46 | 28.788 | |
| 10,980.0 | 7,727.9 | 7,702.2 | 7,700.0 | 96.2 | 16.1 | 68.16 | 179.5 | -484.7 | 3,037.1 | 2,932.0 | 105.10 | 28.897 | |
| 11,000.0 | 7,727.5 | 7,701.8 | 7,699.6 | 96.7 | 16.1 | 68.04 | 179.5 | -484.7 | 3,057.1 | 2,951.6 | 105.53 | 28.970 | |
| 11,010.0 | 7,727.3 | 7,701.5 | 7,699.4 | 97.0 | 16.1 | 67.98 | 179.5 | -484.7 | 3,067.1 | 2,961.3 | 105.74 | 29.007 | |
| 11,040.0 | 7,726.6 | 7,700.9 | 7,698.7 | 97.8 | 16.1 | 67.79 | 179.4 | -484.7 | 3,097.0 | 2,990.6 | 106.37 | 29.115 | |
| 11,070.0 | 7,725.9 | 7,700.2 | 7,698.0 | 98.6 | 16.1 | 67.60 | 179.4 | -484.7 | 3,127.0 | 3,020.0 | 107.00 | 29.223 | |
| 11,100.0 | 7,725.3 | 7,699.5 | 7,697.4 | 99.4 | 16.1 | 67.42 | 179.4 | -484.7 | 3,156.9 | 3,049.3 | 107.63 | 29.330 | |
| 11,130.0 | 7,724.6 | 7,698.9 | 7,696.7 | 100.2 | 16.1 | 67.24 | 179.4 | -484.7 | 3,186.9 | 3,078.6 | 108.26 | 29.437 | |
| 11,160.0 | 7,723.9 | 7,698.2 | 7,696.0 | 101.0 | 16.1 | 67.05 | 179.4 | -484.7 | 3,216.8 | 3,107.9 | 108.89 | 29.543 | |
| 11,190.0 | 7,723.3 | 7,697.6 | 7,695.4 | 101.9 | 16.1 | 66.87 | 179.4 | -484.7 | 3,246.7 | 3,137.2 | 109.51 | 29.648 | |
| 11,200.0 | 7,723.1 | 7,697.3 | 7,695.2 | 102.1 | 16.1 | 66.81 | 179.4 | -484.7 | 3,256.7 | 3,147.0 | 109.72 | 29.683 | |
| 11,220.0 | 7,722.6 | 7,696.9 | 7,694.7 | 102.7 | 16.1 | 66.69 | 179.4 | -484.7 | 3,276.7 | 3,166.6 | 110.13 | 29.753 | |
| 11,250.0 | 7,722.0 | 7,696.2 | 7,694.1 | 103.5 | 16.1 | 66.50 | 179.4 | -484.7 | 3,306.6 | 3,195.9 | 110.75 | 29.857 | |
| 11,280.0 | 7,721.3 | 7,695.6 | 7,693.4 | 104.3 | 16.1 | 66.32 | 179.3 | -484.7 | 3,336.6 | 3,225.2 | 111.37 | 29.961 | |
| 11,300.0 | 7,720.8 | 7,695.1 | 7,693.0 | 104.8 | 16.1 | 66.20 | 179.3 | -484.7 | 3,356.6 | 3,244.8 | 111.77 | 30.030 | |
| 11,310.0 | 7,720.6 | 7,694.9 | 7,692.7 | 105.1 | 16.1 | 66.14 | 179.3 | -484.7 | 3,366.5 | 3,254.6 | 111.98 | 30.064 | |
| 11,340.0 | 7,720.0 | 7,694.2 | 7,692.1 | 105.9 | 16.1 | 65.96 | 179.3 | -484.7 | 3,396.5 | 3,283.9 | 112.59 | 30.167 | |
| 11,370.0 | 7,719.3 | 7,693.6 | 7,691.4 | 106.7 | 16.1 | 65.78 | 179.3 | -484.7 | 3,426.4 | 3,313.2 | 113.20 | 30.269 | |
| 11,400.0 | 7,718.6 | 7,692.9 | 7,690.7 | 107.6 | 16.1 | 65.60 | 179.3 | -484.7 | 3,456.4 | 3,342.6 | 113.81 | 30.371 | |
| 11,430.0 | 7,718.0 | 7,692.3 | 7,690.1 | 108.4 | 16.1 | 65.42 | 179.3 | -484.7 | 3,486.3 | 3,371.9 | 114.41 | 30.472 | |
| 11,460.0 | 7,717.3 | 7,691.6 | 7,689.4 | 109.2 | 16.1 | 65.24 | 179.3 | -484.7 | 3,516.3 | 3,401.3 | 115.01 | 30.573 | |
| 11,490.0 | 7,716.6 | 7,690.9 | 7,688.8 | 110.0 | 16.1 | 65.06 | 179.3 | -484.7 | 3,546.3 | 3,430.6 | 115.61 | 30.674 | |
| 11,500.0 | 7,716.4 | 7,690.7 | 7,688.5 | 110.3 | 16.1 | 65.00 | 179.3 | -484.7 | 3,556.2 | 3,440.4 | 115.81 | 30.707 | |
| 11,520.0 | 7,716.0 | 7,690.3 | 7,688.1 | 110.8 | 16.1 | 64.88 | 179.2 | -484.7 | 3,576.2 | 3,460.0 | 116.21 | 30.774 | |
| 11,550.0 | 7,715.3 | 7,689.6 | 7,687.4 | 111.6 | 16.1 | 64.71 | 179.2 | -484.7 | 3,606.2 | 3,489.4 | 116.80 | 30.874 | |
| 11,580.0 | 7,714.6 | 7,688.9 | 7,686.8 | 112.4 | 16.1 | 64.53 | 179.2 | -484.7 | 3,636.1 | 3,518.7 | 117.40 | 30.973 | |
| 11,600.0 | 7,714.2 | 7,688.5 | 7,686.3 | 113.0 | 16.1 | 64.41 | 179.2 | -484.7 | 3,656.1 | 3,538.3 | 117.79 | 31.039 | |
| 11,610.0 | 7,714.0 | 7,688.3 | 7,686.1 | 113.3 | 16.1 | 64.35 | 179.2 | -484.7 | 3,666.1 | 3,548.1 | 117.99 | 31.072 | |
| 11,640.0 | 7,713.3 | 7,687.6 | 7,685.4 | 114.1 | 16.1 | 64.18 | 179.2 | -484.7 | 3,696.0 | 3,577.5 | 118.57 | 31.171 | |
| 11,670.0 | 7,712.6 | 7,687.0 | 7,684.8 | 114.9 | 16.1 | 64.00 | 179.2 | -484.7 | 3,726.0 | 3,606.8 | 119.16 | 31.269 | |
| 11,700.0 | 7,712.0 | 7,686.3 | 7,684.1 | 115.7 | 16.1 | 63.82 | 179.2 | -484.7 | 3,756.0 | 3,636.2 | 119.74 | 31.367 | |
| 11,730.0 | 7,711.3 | 7,685.6 | 7,683.4 | 116.5 | 16.1 | 63.65 | 179.2 | -484.7 | 3,785.9 | 3,665.6 | 120.32 | 31.465 | |
| 11,760.0 | 7,710.6 | 7,685.0 | 7,682.8 | 117.3 | 16.1 | 63.48 | 179.2 | -484.7 | 3,815.9 | 3,695.0 | 120.90 | 31.562 | |
| 11,790.0 | 7,710.0 | 7,684.3 | 7,682.1 | 118.2 | 16.1 | 63.30 | 179.1 | -484.7 | 3,845.8 | 3,724.4 | 121.48 | 31.659 | |
| 11,800.0 | 7,709.8 | 7,684.1 | 7,681.9 | 118.4 | 16.1 | 63.25 | 179.1 | -484.7 | 3,855.8 | 3,734.2 | 121.67 | 31.692 | |
| 11,820.0 | 7,709.3 | 7,683.6 | 7,681.5 | 119.0 | 16.1 | 63.13 | 179.1 | -484.7 | 3,875.8 | 3,753.7 | 122.05 | 31.756 | |
| 11,850.0 | 7,708.7 | 7,683.0 | 7,680.8 | 119.8 | 16.1 | 62.96 | 179.1 | -484.7 | 3,905.8 | 3,783.1 | 122.62 | 31.853 | |
| 11,880.0 | 7,708.0 | 7,682.3 | 7,680.1 | 120.6 | 16.1 | 62.79 | 179.1 | -484.7 | 3,935.7 | 3,812.5 | 123.19 | 31.949 | |
| 11,900.0 | 7,707.5 | 7,681.9 | 7,679.7 | 121.2 | 16.1 | 62.67 | 179.1 | -484.7 | 3,955.7 | 3,832.1 | 123.57 | 32.013 | |

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

| | | | |
|---|---|---|---|
| **Company:** | Murchison Oil and Gas | **Local Co-ordinate Reference:** | Well War Horse Federal Com #3H |
| **Project:** | Mustang | **TVD Reference:** | WELL @ 3495.2usft (Original Well Elev) |
| **Reference Site:** | Mustang Section 21 | **MD Reference:** | WELL @ 3495.2usft (Original Well Elev) |
| **Site Error:** | 1.0 usft | **North Reference:** | Grid |
| **Reference Well:** | War Horse Federal Com #3H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 1.0 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | War Horse Fed Com #3H | **Database:** | EDM 5000.1 Single User Db |
| **Reference Design:** | 121123 War Horse Federal Com 3H | **Offset TVD Reference:** | Offset Datum |

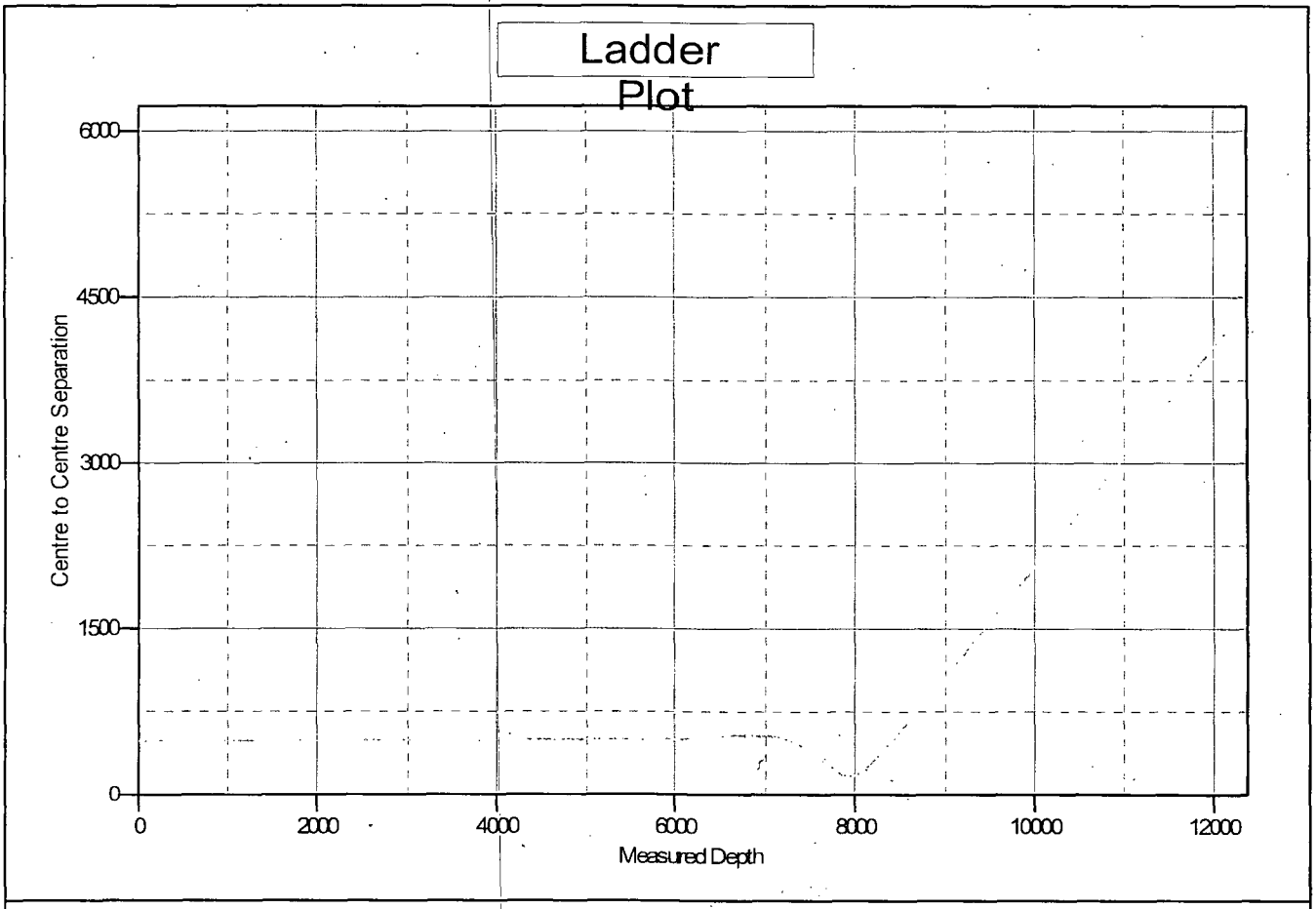
**Offset Design** Mustang Section 21 - Mustang Federal Com #2 - Mustang Federal Com #2 - Mustang Federal Com #2 — **Offset Site Error:** 0.0 usft

**Survey Program:** 281-MWD — **Offset Well Error:** 1.0 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 11,910.0 | 7,707.3 | 7,681.6 | 7,679.5 | 121.4 | 16.1 | 62.61 | 179.1 | -484.7 | 3,965.7 | 3,841.9 | 123.75 | 32.045 | |
| 11,940.0 | 7,706.7 | 7,681.0 | 7,678.8 | 122.2 | 16.1 | 62.44 | 179.1 | -484.7 | 3,995.6 | 3,871.3 | 124.32 | 32.141 | |
| 11,970.0 | 7,706.0 | 7,680.3 | 7,678.1 | 123.1 | 16.1 | 62.27 | 179.1 | -484.7 | 4,025.6 | 3,900.7 | 124.88 | 32.236 | |
| 12,000.0 | 7,705.3 | 7,679.7 | 7,677.5 | 123.9 | 16.1 | 62.10 | 179.1 | -484.7 | 4,055.6 | 3,930.1 | 125.44 | 32.331 | |
| 12,030.0 | 7,704.7 | 7,679.0 | 7,676.8 | 124.7 | 16.1 | 61.93 | 179.0 | -484.7 | 4,085.5 | 3,959.5 | 125.99 | 32.426 | |
| 12,060.0 | 7,704.0 | 7,678.3 | 7,676.2 | 125.5 | 16.1 | 61.76 | 179.0 | -484.7 | 4,115.5 | 3,988.9 | 126.55 | 32.521 | |
| 12,090.0 | 7,703.3 | 7,677.7 | 7,675.5 | 126.3 | 16.1 | 61.60 | 179.0 | -484.7 | 4,145.5 | 4,018.4 | 127.10 | 32.616 | |
| 12,100.0 | 7,703.1 | 7,677.4 | 7,675.3 | 126.6 | 16.0 | 61.54 | 179.0 | -484.7 | 4,155.4 | 4,028.2 | 127.28 | 32.647 | |
| 12,120.0 | 7,702.7 | 7,677.0 | 7,674.8 | 127.2 | 16.0 | 61.43 | 179.0 | -484.7 | 4,175.4 | 4,047.8 | 127.65 | 32.710 | |
| 12,150.0 | 7,702.0 | 7,676.3 | 7,674.2 | 128.0 | 16.0 | 61.26 | 179.0 | -484.7 | 4,205.4 | 4,077.2 | 128.20 | 32.804 | |
| 12,180.0 | 7,701.3 | 7,675.7 | 7,673.5 | 128.8 | 16.0 | 61.09 | 179.0 | -484.7 | 4,235.4 | 4,106.6 | 128.74 | 32.898 | |
| 12,200.0 | 7,700.9 | 7,675.2 | 7,673.1 | 129.3 | 16.0 | 60.98 | 179.0 | -484.7 | 4,255.3 | 4,126.2 | 129.10 | 32.961 | |
| 12,210.0 | 7,700.7 | 7,675.0 | 7,672.8 | 129.6 | 16.0 | 60.93 | 179.0 | -484.7 | 4,265.3 | 4,136.0 | 129.28 | 32.992 | |
| 12,240.0 | 7,700.0 | 7,674.4 | 7,672.2 | 130.4 | 16.0 | 60.76 | 179.0 | -484.7 | 4,295.3 | 4,165.5 | 129.82 | 33.086 | |
| 12,250.0 | 7,699.8 | 7,674.1 | 7,672.0 | 130.7 | 16.0 | 60.71 | 179.0 | -484.7 | 4,305.3 | 4,175.3 | 130.00 | 33.117 | |

| | | | |
|---|---|---|---|
| **Company:** | Murchison Oil and Gas | **Local Co-ordinate Reference:** | Well War Horse Federal Com #3H |
| **Project:** | Mustang | **TVD Reference:** | WELL @ 3495.2usft (Original Well Elev) |
| **Reference Site:** | Mustang Section 21 | **MD Reference:** | WELL @ 3495.2usft (Original Well Elev) |
| **Site Error:** | 1.0 usft | **North Reference:** | Grid |
| **Reference Well:** | War Horse Federal Com #3H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 1.0 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | War Horse Fed Com #3H | **Database:** | EDM 5000.1 Single User Db |
| **Reference Design:** | 121123 War Horse Federal Com 3H | **Offset TVD Reference:** | Offset Datum |

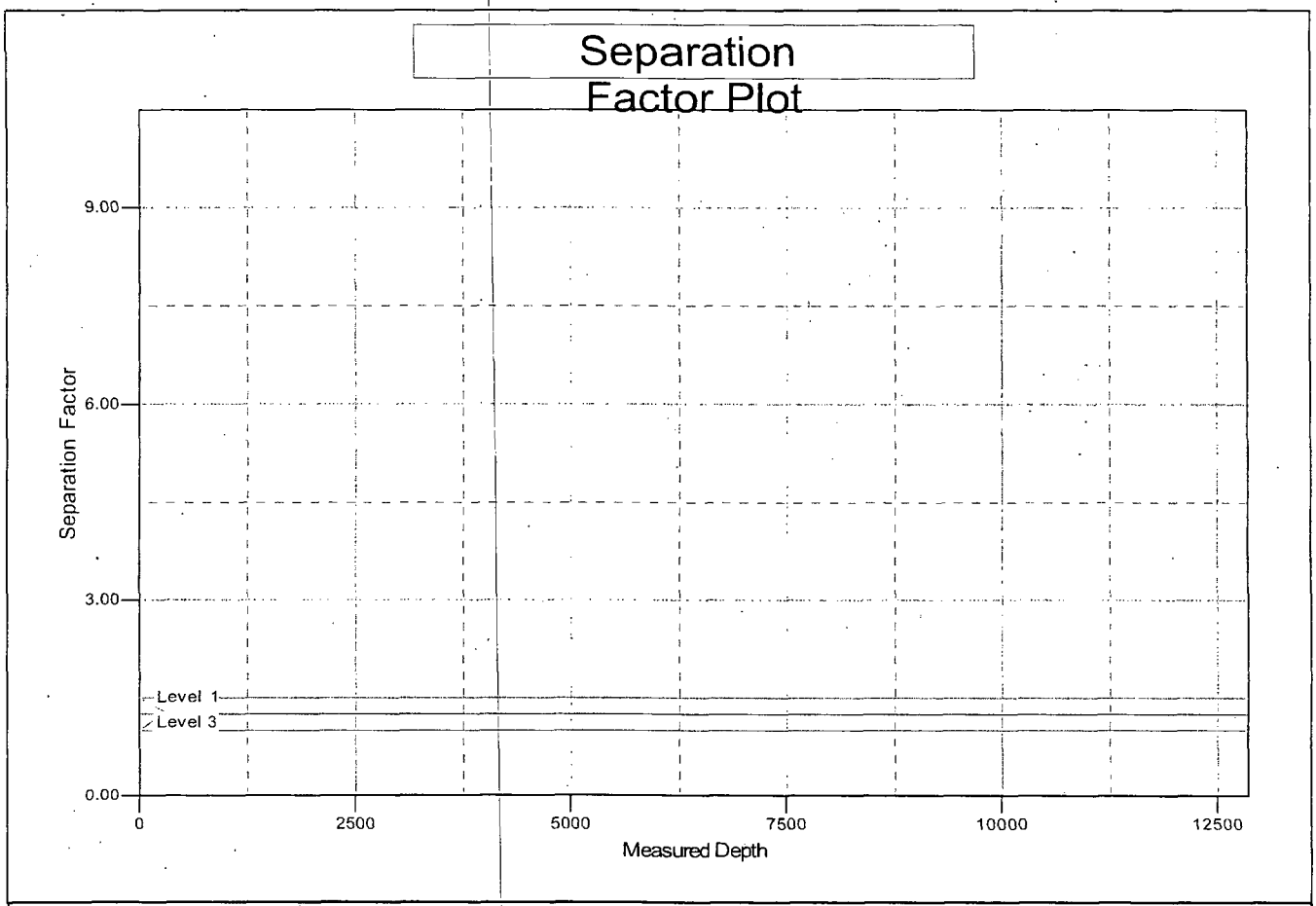
| | |
|---|---|
| Reference Depths are relative to WELL @ 3495.2usft (Original Well Ele | Coordinates are relative to: War Horse Federal Com #3H |
| Offset Depths are relative to Offset Datum | Coordinate System is US State Plane 1983, New Mexico Eastern Zone |
| Central Meridian is 104° 20' 0.000 W | Grid Convergence at Surface is: 0.14° |



| | | | |
|---|---|---|---|
| **Company:** | Murchison Oil and Gas | **Local Co-ordinate Reference:** | Well War Horse Federal Com #3H |
| **Project:** | Mustang | **TVD Reference:** | WELL @ 3495.2usft (Original Well Elev) |
| **Reference Site:** | Mustang Section 21 | **MD Reference:** | WELL @ 3495.2usft (Original Well Elev) |
| **Site Error:** | 1.0 usft | **North Reference:** | Grid |
| **Reference Well:** | War Horse Federal Com #3H | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 1.0 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | War Horse Fed Com #3H | **Database:** | EDM 5000.1 Single User Db |
| **Reference Design:** | 121123 War Horse Federal Com 3H | **Offset TVD Reference:** | Offset Datum |

Reference Depths are relative to WELL @ 3495.2usft (Original Well Ele
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: War Horse Federal Com #3H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.14°

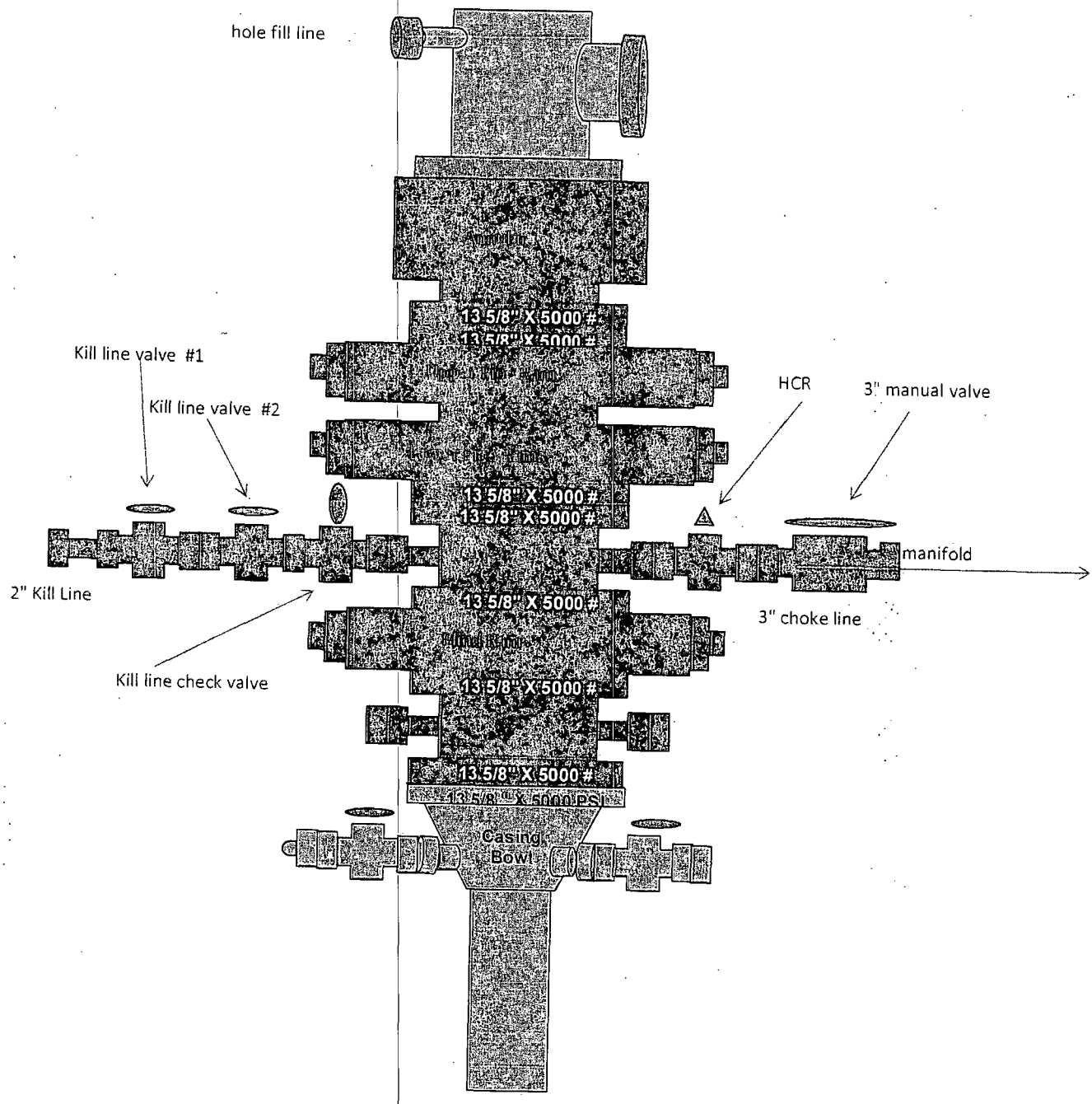



LEGEND

l Com #2, Mustang Federal Com #2 V0

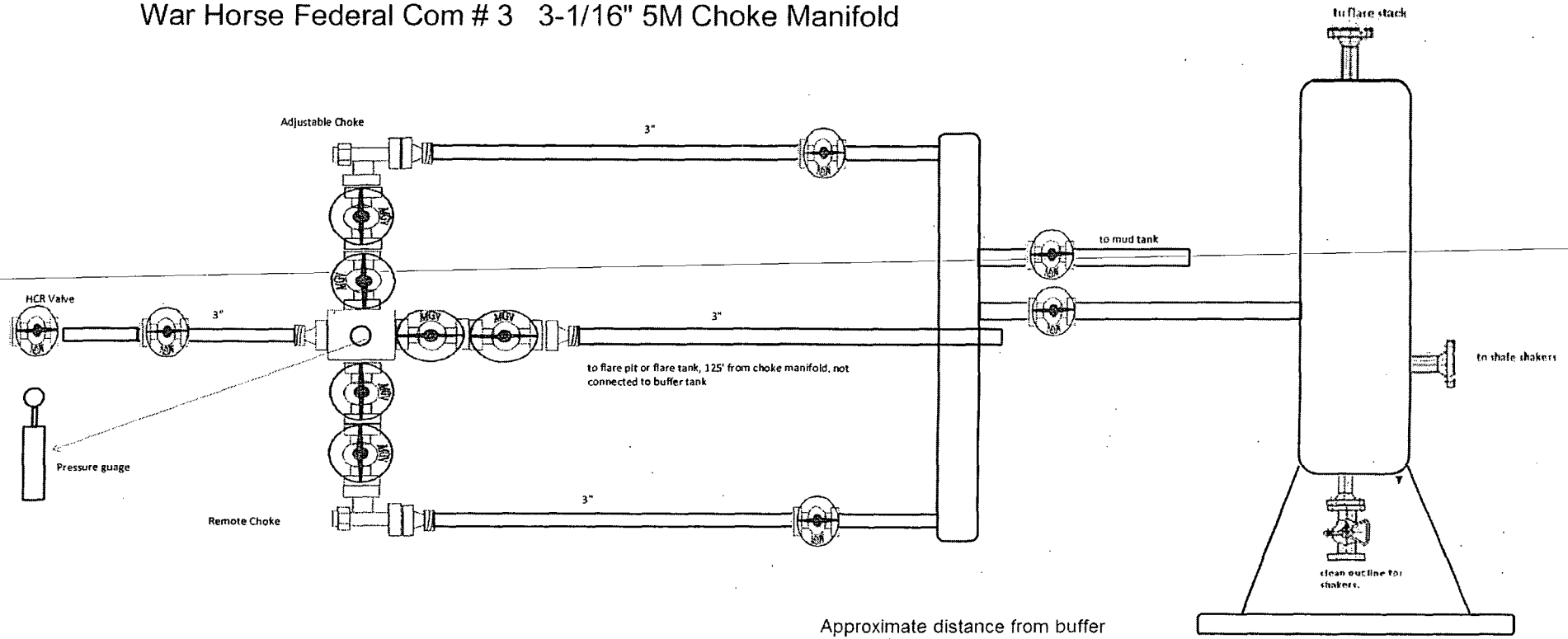
# EXHIBIT G-1

War Horse Federal Com #3 - 13-5/8" 5M BOP stack



# EXHIBIT G-2

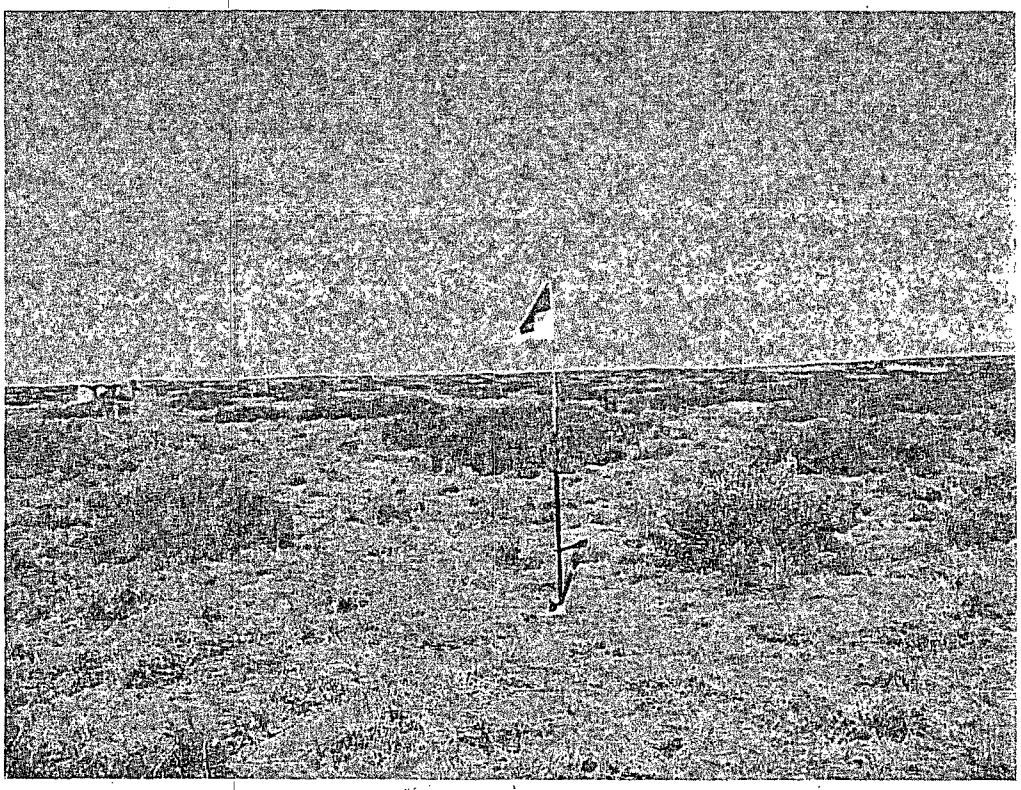
War Horse Federal Com # 3  3-1/16" 5M Choke Manifold




Approximate distance from buffer tank to mud tanks is 15'.

October 2012

# C-144 Permit Package for War Horse Federal Com No. 3H Well Section 21 T18S R29E Eddy County NM



## Prepared for
## Murchison Oil & Gas, Inc.
## Plano, Texas

**Prepared by**
**R.T. Hicks Consultants, Ltd.**
**Albuquerque, New Mexico**

# R. T. HICKS CONSULTANTS, LTD.

901 Rio Grande Blvd NW ▲ Suite F-142 ▲ Albuquerque, NM 87104 ▲ 505.266.5004 ▲ Fax: 505.266-0745


October 19, 2012

Mr. Mike Bratcher
NMOCD District 2
811 South First Street
Artesia, New Mexico 88210
Via E-mail and US Mail

Mr. John Fast
BLM Carlsbad
Via E-mail

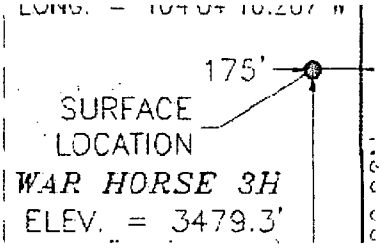
RE: Murchison Oil and Gas: War Horse #3H

Dear Mike:

For the above-referenced temporary pit, attached are:

1. A C-144 Form
2. Supplemental information to support the C-144

Please note that Plate 1 of the permit application provides the location of the proposed pit in relation to the well and surveyed elevations near the pit. The Pit Rule (19.15.17.9.D.2) states: "... If the operator plans to use a temporary pit, the operator shall provide the proposed pit location on form C-102." On the Form C-102, the location of the pit would plot as a small dot in the portion of the C-102 shown in the figure (right). Therefore, we ask for administrative approval to use Plate 1 in lieu of showing the location of the pit on Form C-102.




We are concerned that Santa Fe has mandated reviews of C-144s for drilling pits commence after BLM approves the APD. Because NMOCD reviews for C-144 permits might require 40-60 days, we respectfully request that OCD and BLM communicate regarding their reviews of the proposal to employ a temporary pit. Such communication could allow OCD to begin review of the C-144 when BLM signals their consent to use a temporary pit. This could shorten the time between permit submission and approval.

As shown below, we are sending a copy of this application to Concho Resources to serve as notice to the surface owner of the intention to dispose of drilling waste on-site. As always, thanks for your help.

Sincerely,
R.T. Hicks Consultants

Randall Hicks

Copy: Murchison Oil and Gas, Inc.
Rand French, Concho Resources

# C-144 and Site Specific Information for Drilling Pit

**R.T. Hicks Consultants, Ltd.**
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

## Distance to Groundwater

**Figure 2a, 2b, and the discussion presented below demonstrates that groundwater (fresh water as defined by NMOCD Rules) at the location is greater than 100 feet beneath the temporary pit.**

Figure 1 is an area topographic map that shows the location of the temporary pits (both War Horse #1H and #3H) as orange squares.

Figure 2a is a Regional Geologic Map that shows:

1. The location of the temporary pits (both Murchison well locations) as orange squares.
2. The potentiometric surface contours representing the shallowest aquifer as solid blue lines.
3. Open File Report No. 95 (OFR-95) listed wells as solid squares identified by well total depth (light blue is less than 151 feet, green is 151 to 500 feet, and yellow is unreported).
4. Water wells from the USGS database as red triangles.
5. There are 4 wells in the area listed on the Office of the State Engineer (OSE) database, but only one (RA-7774) includes groundwater elevation data and it is located adjacent to a USGS well (USGS-1344) that has more recent water level data. Therefore none of the OSE wells were included on the map.

Figure 2b is the same as Figure 2a with well numbers that correspond to the table provided in Appendix SSI-A and excluding the groundwater elevations and contours.

### Geology

The proposed temporary pit is located on an outcrop of the Quaternary eolian deposits (Qe on Figure 2). It consists of low sand dunes that have been stabilized by vegetation. Quaternary piedmont (Qp), alluvium (Qa), and older alluvium (Qoa) are also exposed at the surface near the site. Underlying the thin layer of Quaternary age sediments is the Permian Rustler Formation (Pr on Figure 2). It is exposed at the surface approximately 5 miles to the south and 8 miles to the northwest. The Rustler is probably more than 150 feet thick at this site and consists of siltstone, gypsum, sandstone, and dolomite, which provide fresh water to a few nearby wells. The underlying Permian Salado Formation (Psl on Figure 2) is comprised of evaporite sequence rocks (gypsum, shale, salts) and is not considered a source for fresh water. Salado Formation rocks are exposed at the surface 11 miles to the west. The Permian-Artesia Group (Pat on Figure 2) crops out approximately 12 miles to the west of the site and extends in the subsurface to the east, underlying the Salado Formation. These formations are comprised of more clastic (shelf facies) rocks that are capable of producing fresh water when located near the surface and below the water table elevation; conditions that are not present at this site.

Topographically, the site is located on a gentle southeast slope that is interrupted by small dunes. Surface drainage for the area is provided by Bear Grass Draw, located approximately 0.5 miles to the east.

## Water Table Elevation

Twenty water wells were identified in the area, which were used to construct the regional potentiometric surface map provided in Figure 2a. Most of the depth to water measurements were recorded in OFR-95, are dated from 1948 to 1977, and should be considered conservative with respect to this evaluation (see Appendix SSI-A). The OFR-95 potentiometric surface map (not included) indicated that the groundwater elevation near the War Horse sites was approximately 3,280 feet above sea level (approximately 216 feet below the surface). This map however contained a few contour anomalies. To verify the data we elected to field check three locations (four wells) that were close to the site. These included: (1) a data point located in Section 24, approximately 2.5 miles to the east, (2) a data point located in Section 34, approximately 2.0 miles to the south-southeast, and (3) a data point located in Section 29 (T-17-S, R-29-E), 4.5 miles to the north. A summary of the investigation of these data points is provided on the table below:

| | Well Location | | | | | | Well Source Information | | | | | | Groundwater Elevation Data | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Well Numbers | Township (south) | Range (east) | Section | Quarter Section (64, | 16, | 4) | NM-OSE Database | USGS Database | Open File Rpt. 95 | USGS Topo Sheet | Aerial Photograph | Field Verification | Surface Elevation (published) | Surface Elevation (Topo Sheet) | Well Total Depth (published) | Depth to Water (published) | Groundwater Elev. (published) | Groundwater Elev. (using topo elev.) | Gauging Date |
| Misc - 36 | 17 | 29 | 29 | 4 | 4 | 4 | | | ✓ | ✓ | ✓ | ✓ | | 3,545 | | 102.4 | | 3442.6 | 10/4/12 |
| Misc - 26a | 18 | 29 | 24 | 1 | 1 | 3 | | | ✓ | ✓ | ✓ | ✓ | 3,430 | 3,436 | | 158.3 | 3,272 | 3,278 | 4/28/50 |
| Misc - 26b | 18 | 29 | 24 | 1 | 1 | 3 | | | ✓ | ✓ | ✓ | ✓ | 3,436 | 3,436 | | 156.44 | 3,280 | 3,280 | 10/18/77 |
| Unnamed | 18 | 29 | 34 | | | | | | ✓ | | | | Could not identify current or historic location | | | | | | |

✓ Indicates well was verified, (blank) indicates well not verified, and -- indicates no attempt to verify

Visual inspections of questionable wells were performed to verify the information provided by the public records and published reports. Initially, an attempt was made to identify each well using USGS topographic maps. The surface elevations of wells identified on the maps were compared to the published surface elevation, if available. Wells that could not be verified using maps were searched for using current and historic satellite photographs in an effort to identify windmills, tanks, or roads associated with the well. Locations that could not be verified by maps or photographs were verified in the field. Attempts were also made to gauge wells during the field investigation when access was permitted. The results of the field inspections are summarized as follows:

- Wells No. Misc-26a and Misc-26b were both present at the approximate location reported in OFR-95, which included only one of the wells. An effort was made to measure the depth to water but casing access was not possible in either well. Based on the inspection, it was assumed that the data in OFR-95 was valid for this area.

- Evidence of the unnamed well in Section 34, south of the site, could not be located after a thorough search of the area. It is therefore assumed that the well was incorrectly identified in OFR-95 and the data, which indicated a groundwater elevation of 3,210 feet above sea level, was not utilized in the creation of Figure 2a.

- Well No. Misc-36 was identified at the location reported in OFR-95 but the casing had collapsed and could not be accessed. A section of exposed casing is present approximately 30 feet to the southeast of the former windmill. According to the land owner this water well encountered groundwater but was not considered productive. The depth to water in the newer well was measured at 102.4 feet below the surface on October 4, 2012, which is significantly less than the 210-foot depth recorded in OFR-95 from the windmill in 1948. The OFR-95 groundwater elevation for the windmill is considered to be incorrect and was discarded in favor of the recent data in the preparation of Figure 2a.

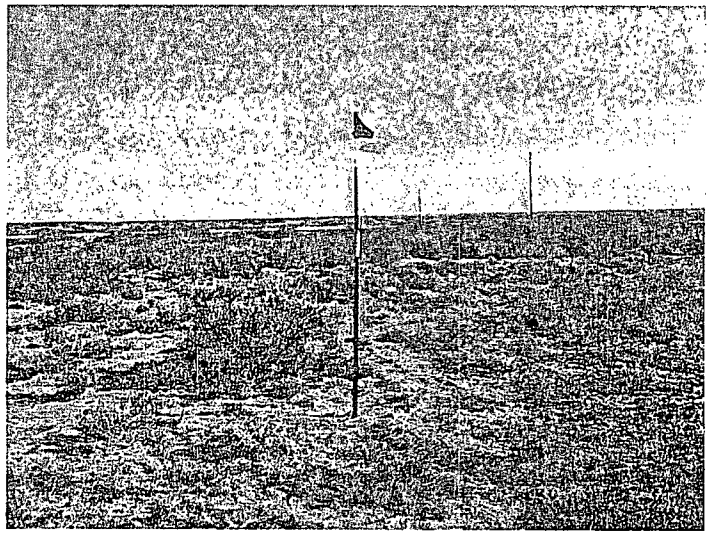
### Distance Between Bottom of Pit and Groundwater

All of the groundwater in the area is produced from the Permian Rustler Formation, which is considered a regionally consistent aquifer. The most recent and accurate available groundwater data was used in the preparation of the potentiometric map (Figure 2a). Based on this map and the well survey information provided, War Horse Federal Com. No. 3H should encounter groundwater at an elevation of 3,315 feet above sea level, which is approximately 164 feet below the surface or 151 feet below the bottom of the deepest pit.

## Distance to Surface Water

**Figure 3a and 3b and the site visit demonstrates that the location is not within 300 feet of a continuously flowing watercourse, or 200 feet of any other significant watercourse or lakebed, sinkhole, or playa lake (measured from the ordinary high-water mark).**

- The nearest USGS identified drainage feature (Bear Grass Draw) is approximately 2,500 feet to the east of the site and flows to the south.
- No other watercourses, as defined by NMOCD Rules, or water bodies exist with 300-feet of the location.



Typical Ground Surface (photo looking north)

## Distance to Permanent Residence or Structures

**Figure 3a and the site visit demonstrates that the location is not within 300 feet from a permanent residence, school, hospital, institution, church, or other structure in existence at the time of initial application.**

## Distance to Non-Public Water Supply

**Figures 2a and 2b demonstrate that the location is not within 500 horizontal feet of a private, domestic fresh water well or spring that less than five households use for domestic or stock watering purposes, or within 1000 horizontal feet of any other fresh water well or spring, in existence at the time of initial application.**

- The nearest water well (Misc-26) is located approximately 2.5 miles to the east, both wells in this area are used for livestock.
- No springs were identified within the mapping area.

## Distance to Municipal Boundaries and Fresh Water Fields

**Figure 4 demonstrates that the location is not within incorporated municipal boundaries or defined municipal fresh water well fields covered under a municipal ordinance adopted pursuant to NMSA 1978, Section 3-27-3, as amended.**

- The closest municipality is Artesia, NM approximately 20 miles to the west.
- The closest public well field is located approximately 17 miles to the northeast.

## Distance to Wetlands

**Figure 5 demonstrates the location is not within 500 feet of wetlands.**

- The nearest designated wetlands is a "Freshwater Pond" located approximately 7,000 feet to the northeast.
- A designated "Freshwater Pond" with an associated "Emergent Wetland" is also located approximately 10,000 feet to the northwest.

## Distance to Subsurface Mines

**Figure 6 and our general reconnaissance of the area demonstrate that the nearest subsurface mines are caliche pits.**

- The nearest caliche pit is located approximately 4,000 feet to the northeast.

## Distance to High or Critical Karst Areas

**Figure 7 shows the location of the temporary pits with respect BLM Karst areas**

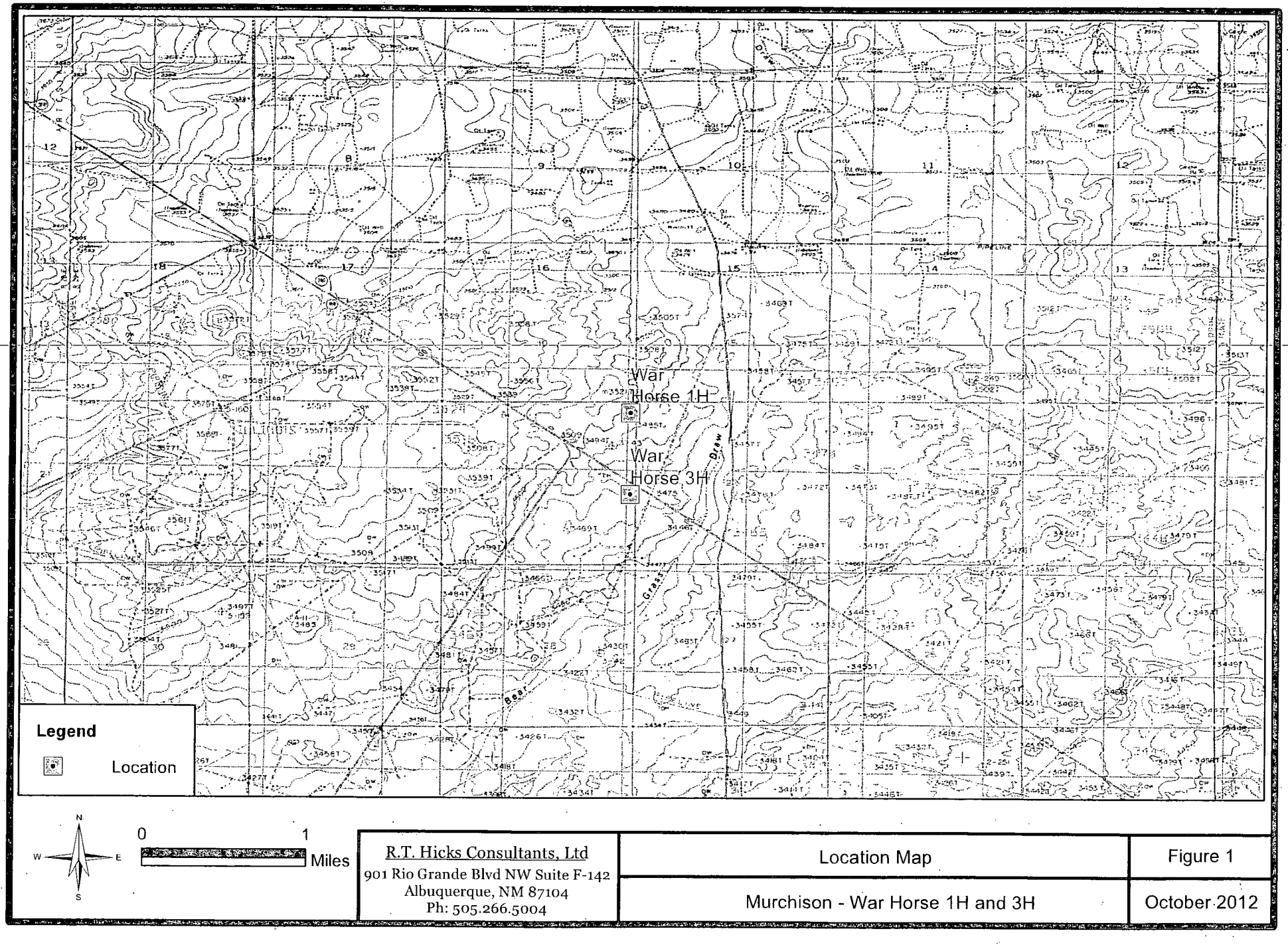
- The proposed temporary pit is located within a "low" potential karst area. This designation is defined as "areas of questionable karst geology and few if any known caves or karst features" according to the BLM.
- The nearest "high" potential karst area is located approximately 7.0 miles northwest of the site. This designation is defined as "areas of known karst geology that contain high density of significant caves and karst features" according to the BLM.
- No evidence of solution voids were observed near the site during the field inspection.

## Distance to 100-Year Floodplain

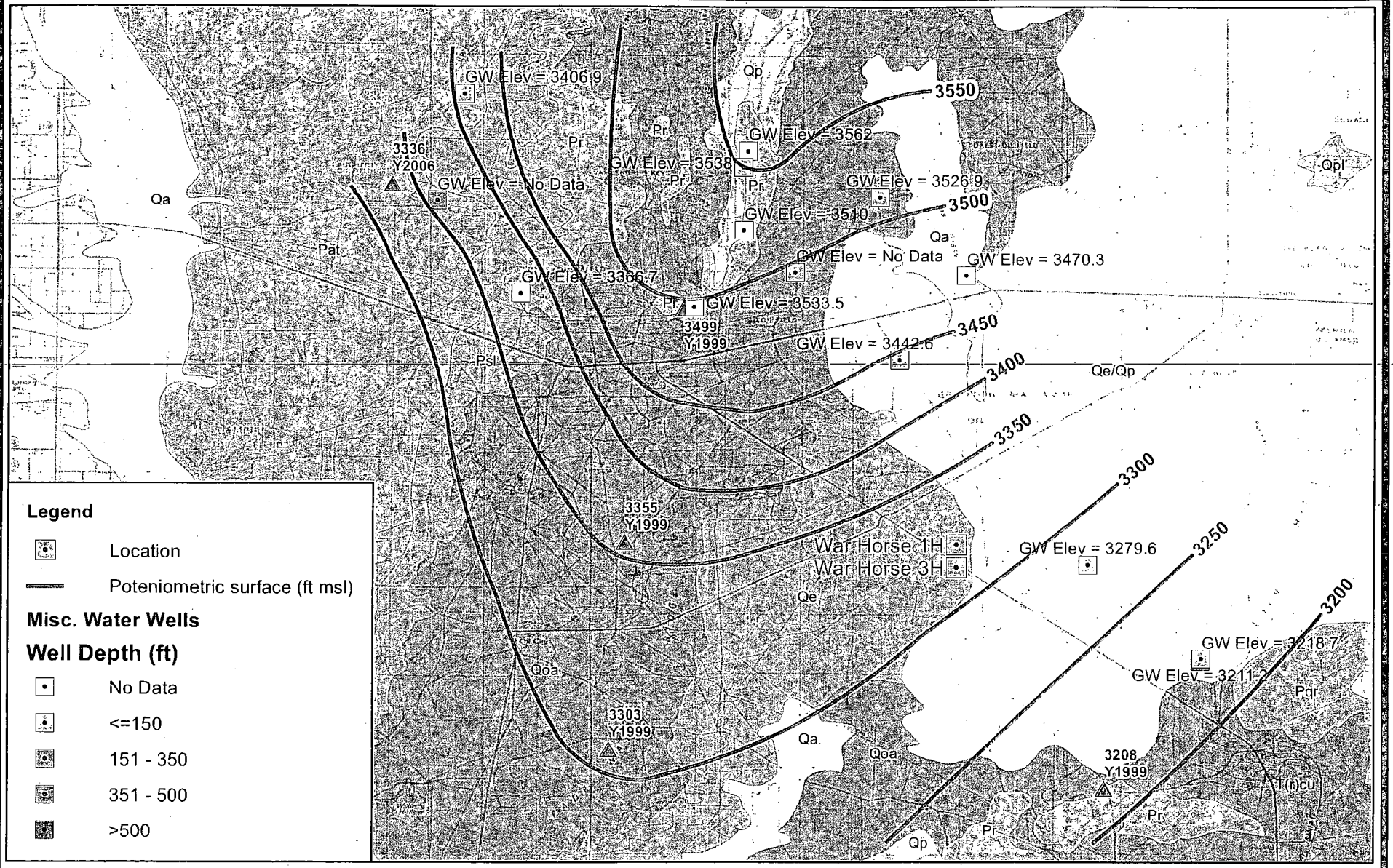
**Figure 8 demonstrates that the location is not within a 100-year floodplain.**
The location is within Zone X of FEMA Flood Zone Designation. Zone X is defined as an area of minimal flood hazard and above the 500-year (0.2% annual chance) flood level. The nearest Zone A Flood Hazard area is located approximately 2,800 feet to the east.

# Site Specific Information
# Figures

**R.T. Hicks Consultants, Ltd.**
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104




| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Location Map | Figure 1 |
| | Murchison - War Horse 1H and 3H | October 2012 |

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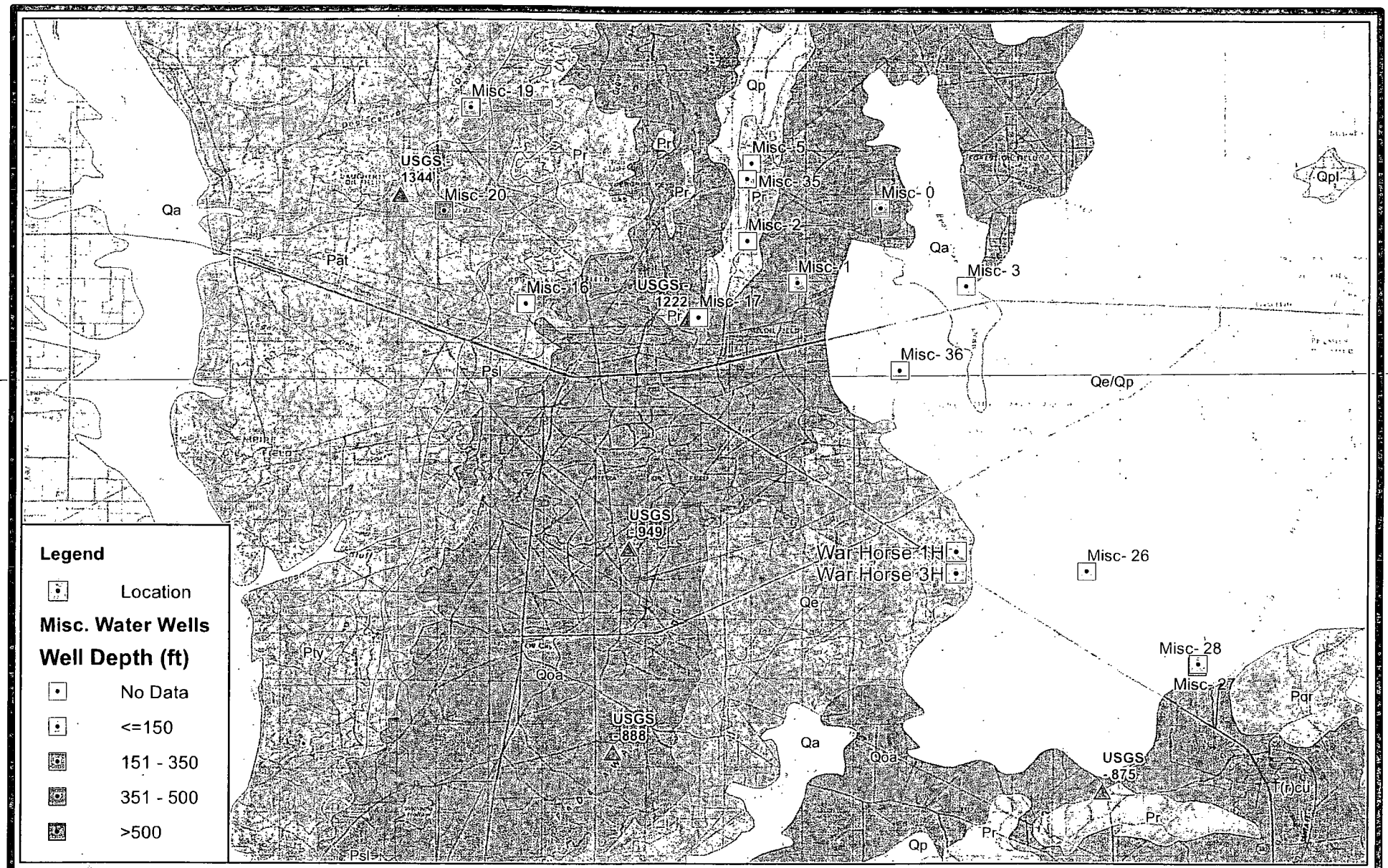
Ph: 505.266.5004

Geology and Groundwater Elevation

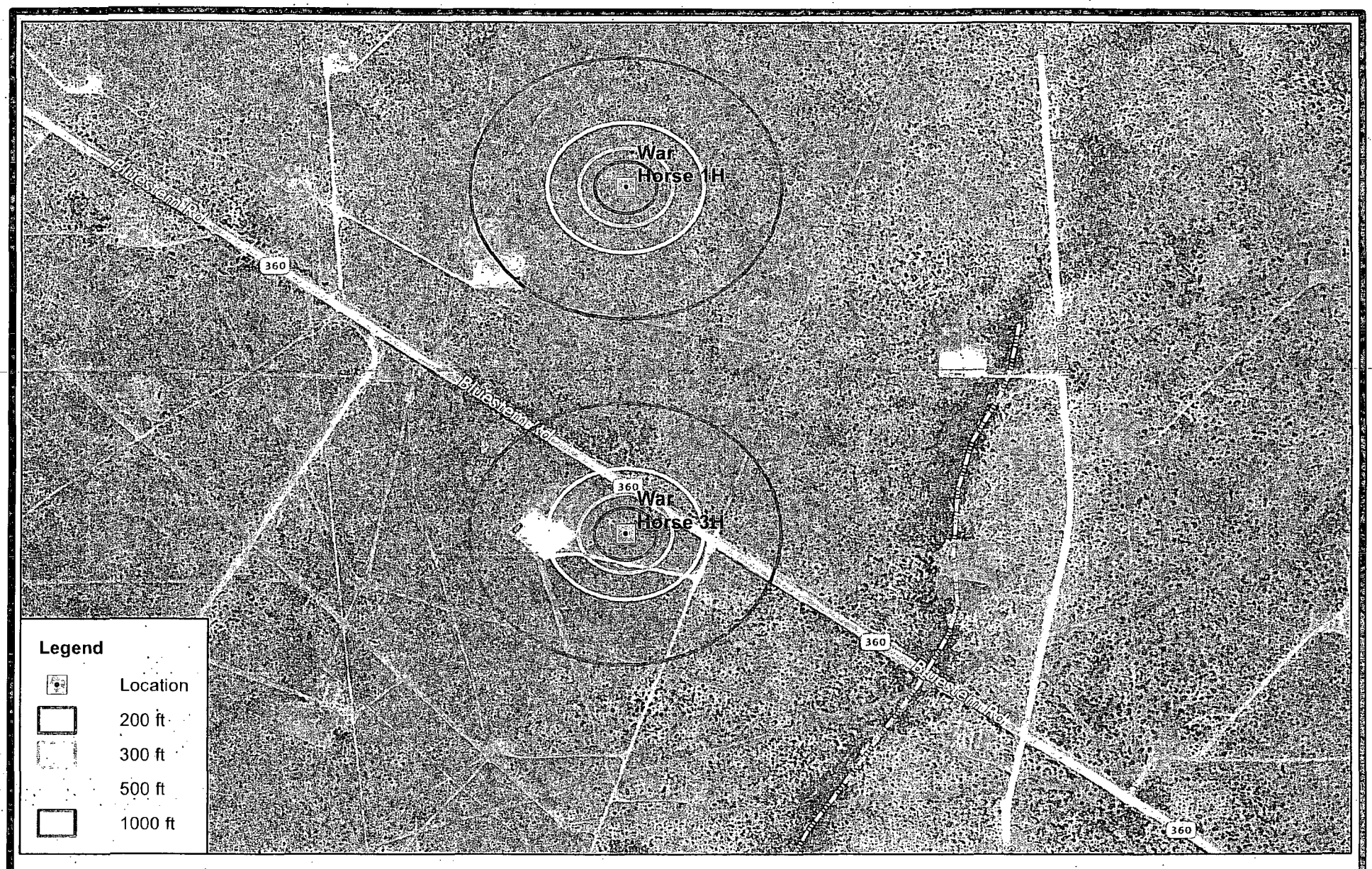
Figure 2a

Murchison - War Horse 1H and 3H

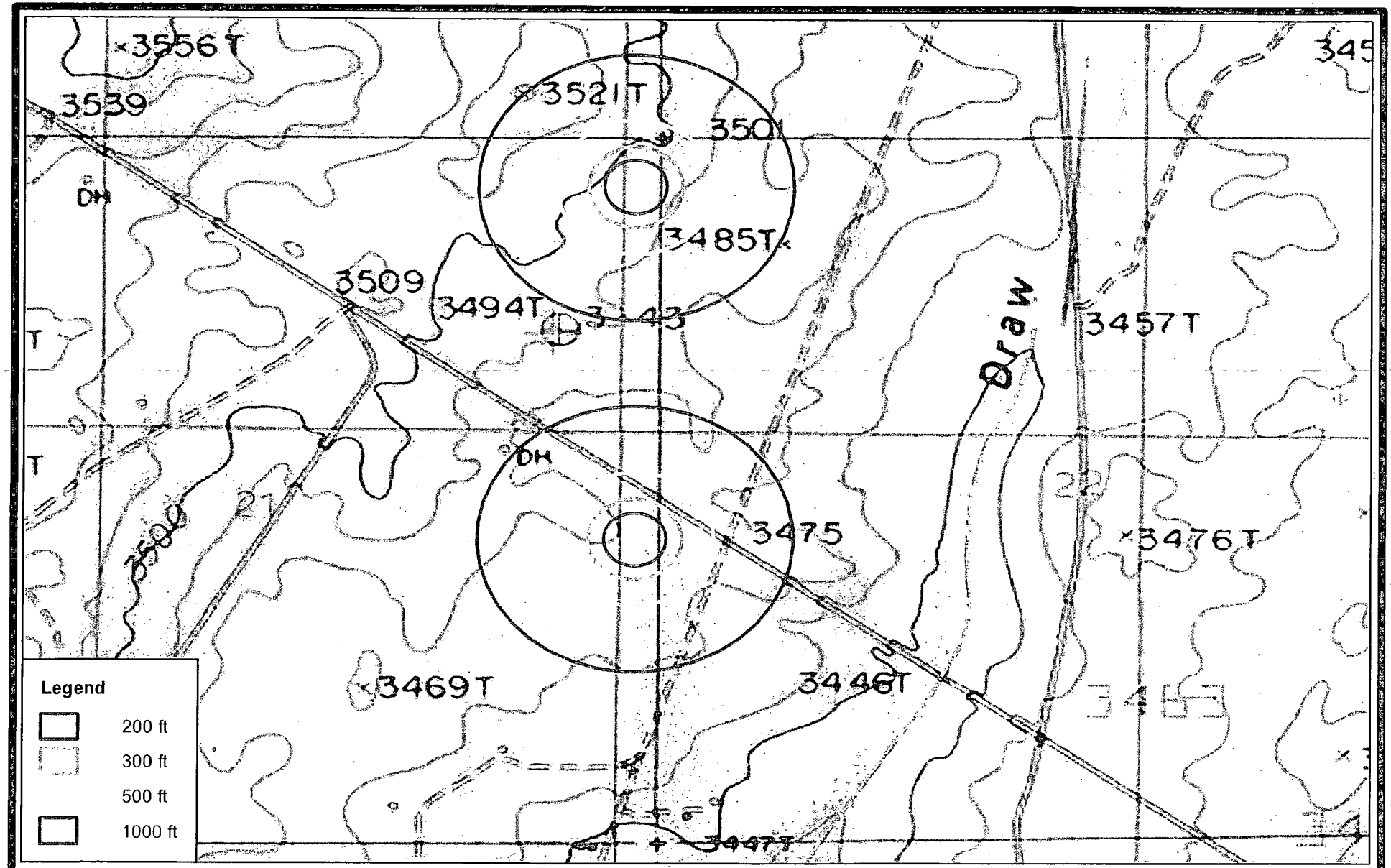
October 2012



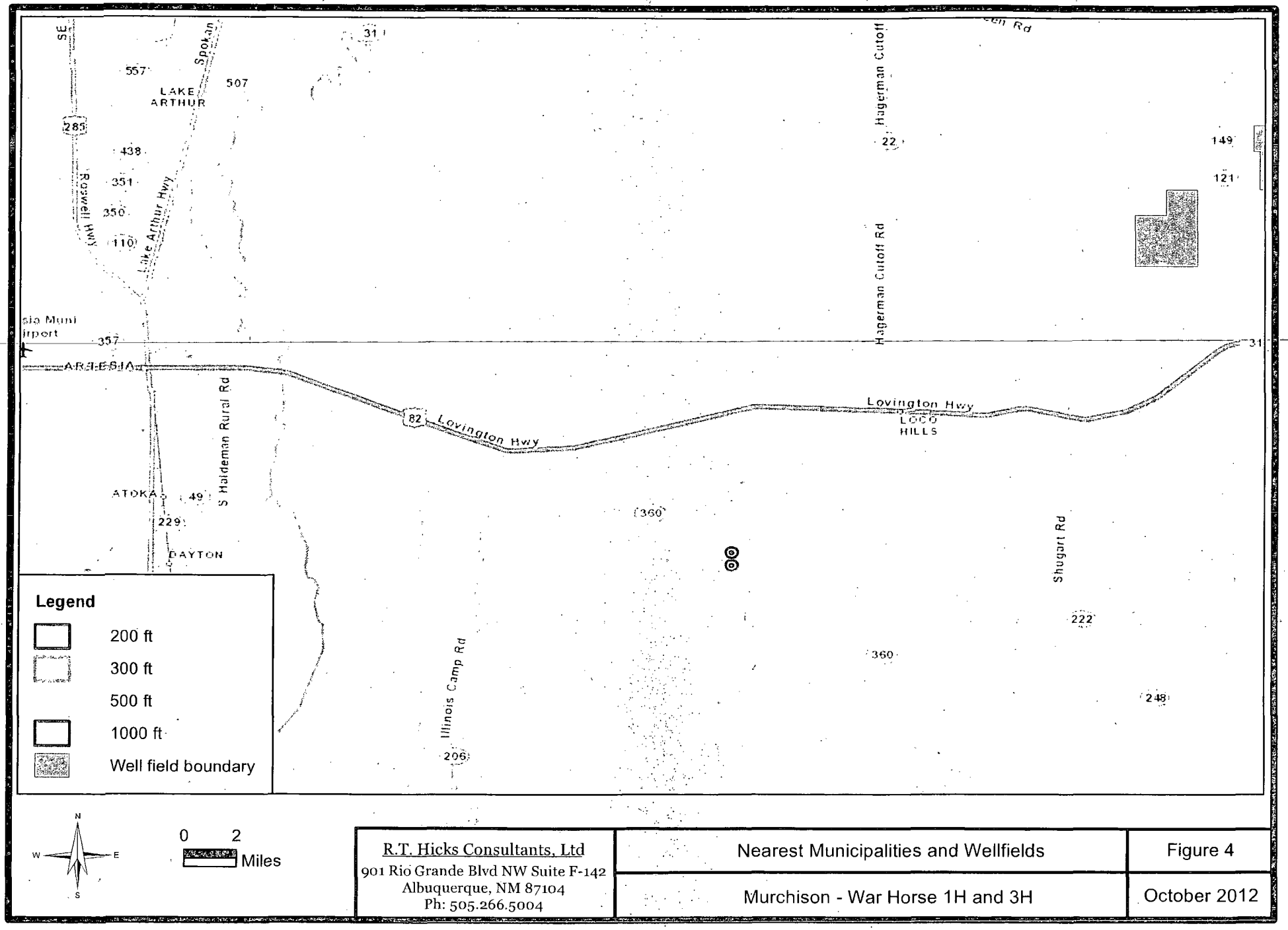

| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Location of Wells with Groundwater Data | Figure 2b |
| | Murchison - War Horse 1H and 3H | October 2012 |




| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Air Photo Showing Mapped Surface Water | Figure 3a |
| | Murchison - War Horse 1H and 3H | October 2012 |




| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | Topography and Mapped Surface Water | Figure 3b |
| | Murchison - War Horse 1H and 3H | October 2012 |

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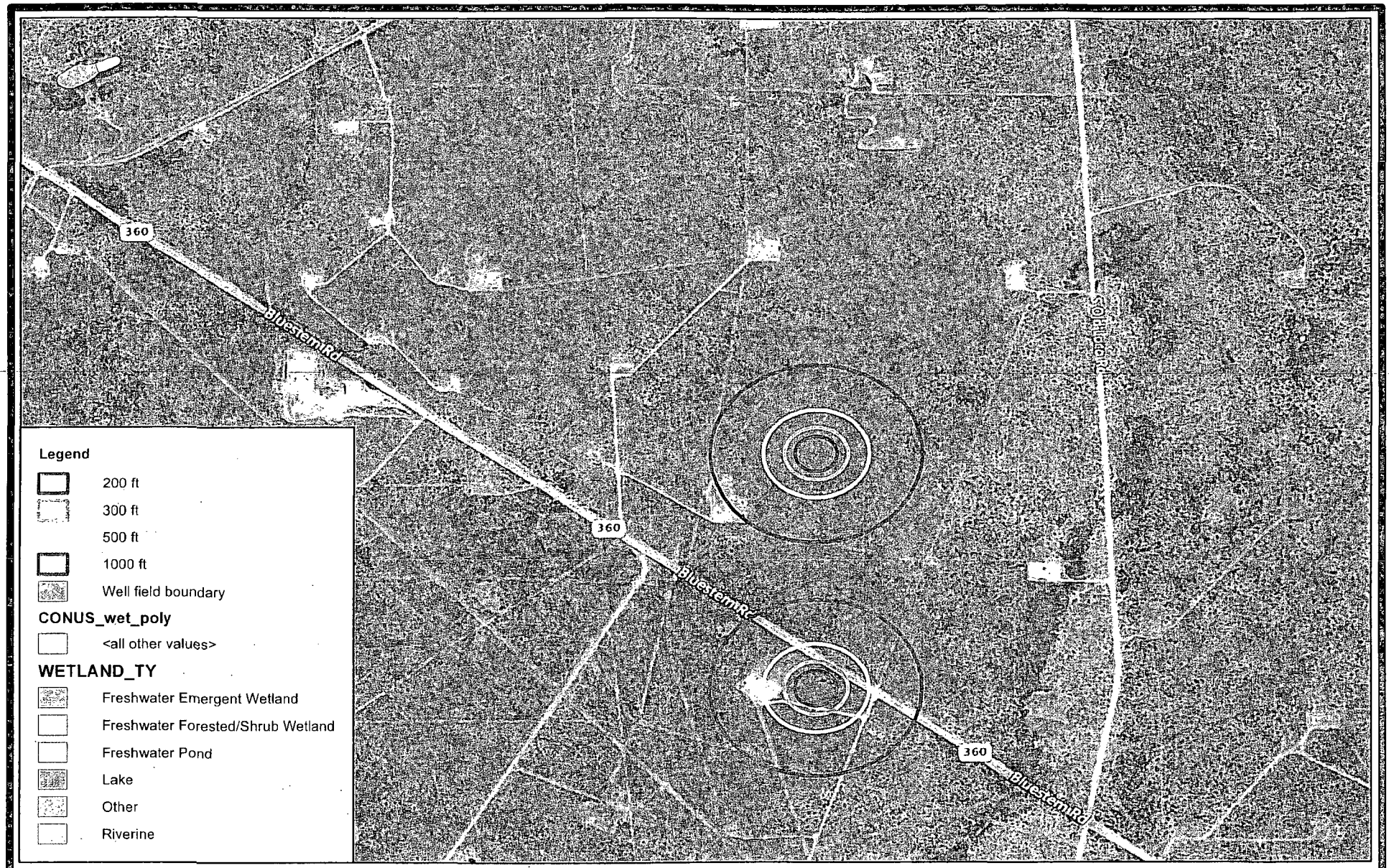
| | |
|---|---|
| Nearest Municipalities and Wellfields | Figure 4 |
| Murchison - War Horse 1H and 3H | October 2012 |

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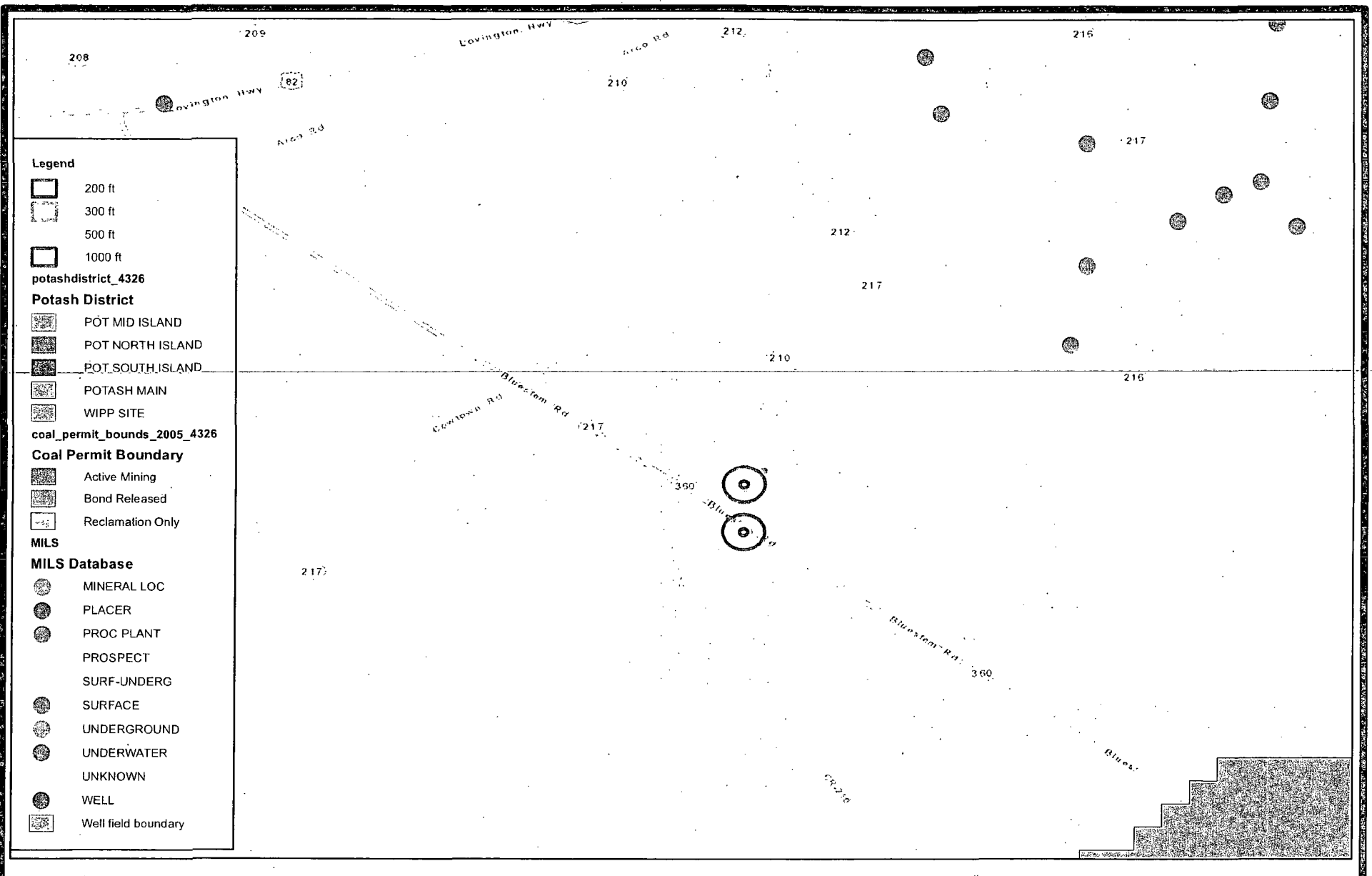
Nearest Mapped Wetlands

Figure 5

Murchison - War Horse 1H and 3H

October 2012

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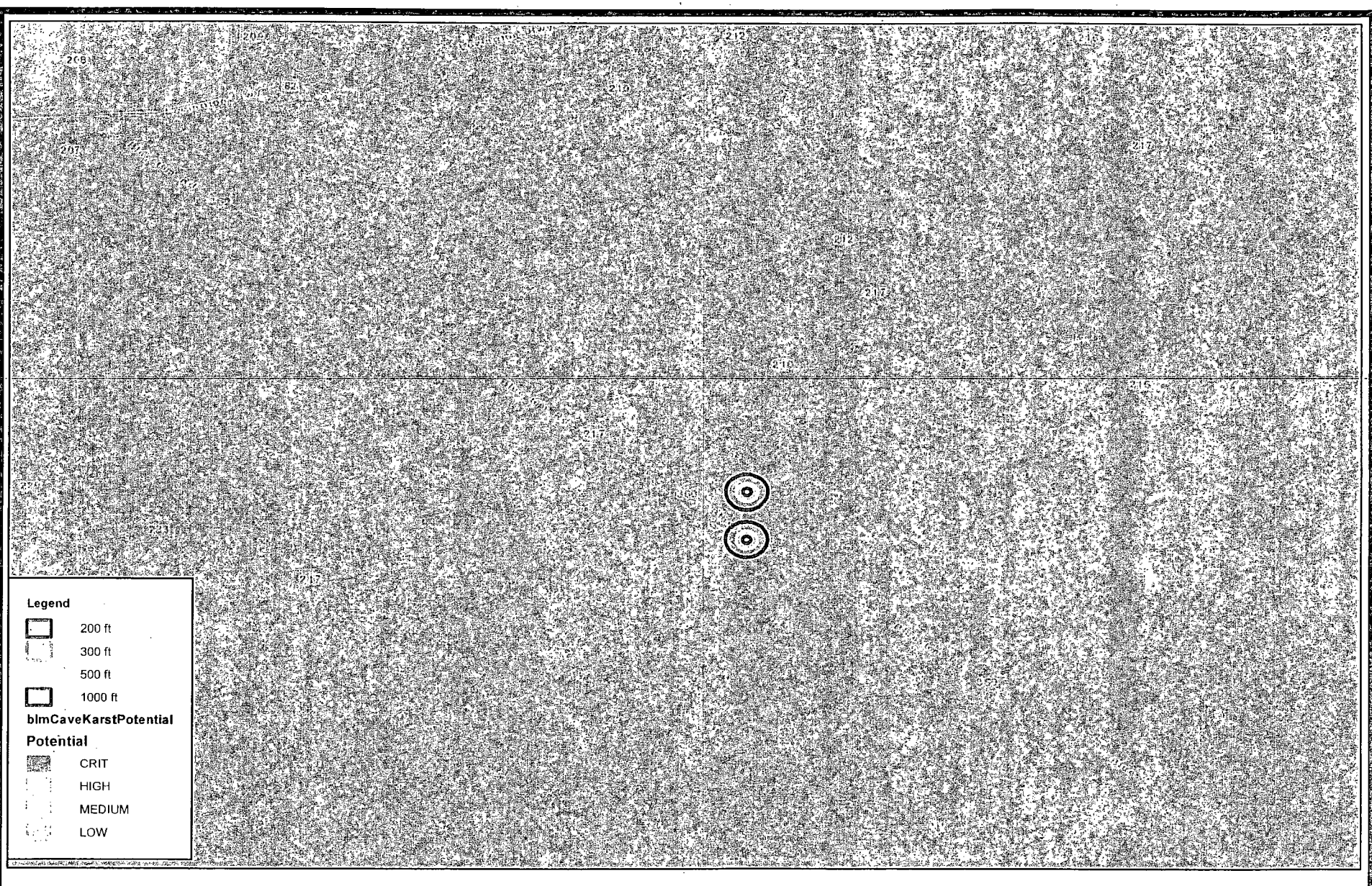
Nearest Mapped Mines

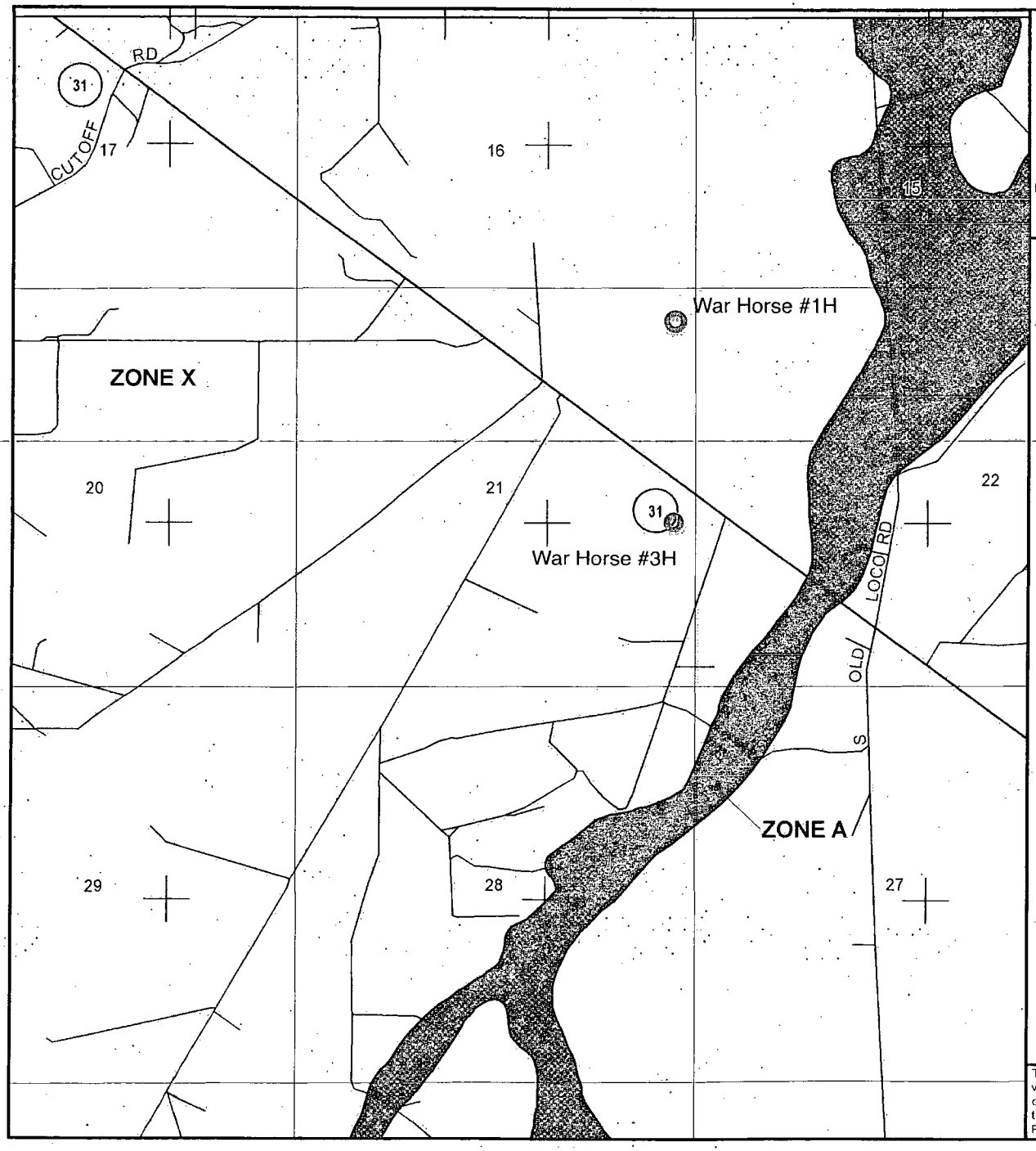
Figure 6

Murchison - War Horse 1H and 3H

October 2012




| | | |
|---|---|---|
| R.T. Hicks Consultants, Ltd<br>901 Rio Grande Blvd NW Suite F-142<br>Albuquerque, NM 87104<br>Ph: 505.266.5004 | BLM Cave/Karst Potential Map | Figure 7 |
| | Murchison - War Horse 1H and 3H | October 2012 |




MAP SCALE 1" = 2000'

1,000 0 1,000 2,000 3,000 4,000

FEET

MET

# Figure 8

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 0625D

# FIRM

## FLOOD INSURANCE RATE MAP

## EDDY COUNTY, NEW MEXICO AND INCORPORATED AREAS

**PANEL 625 OF 2000**

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

| COMMUNITY | NUMBER | PANEL | SUFFIX |
|---|---|---|---|
| EDDY COUNTY, UNINCORPORATED AREAS | 350120 | 0625 | D |

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

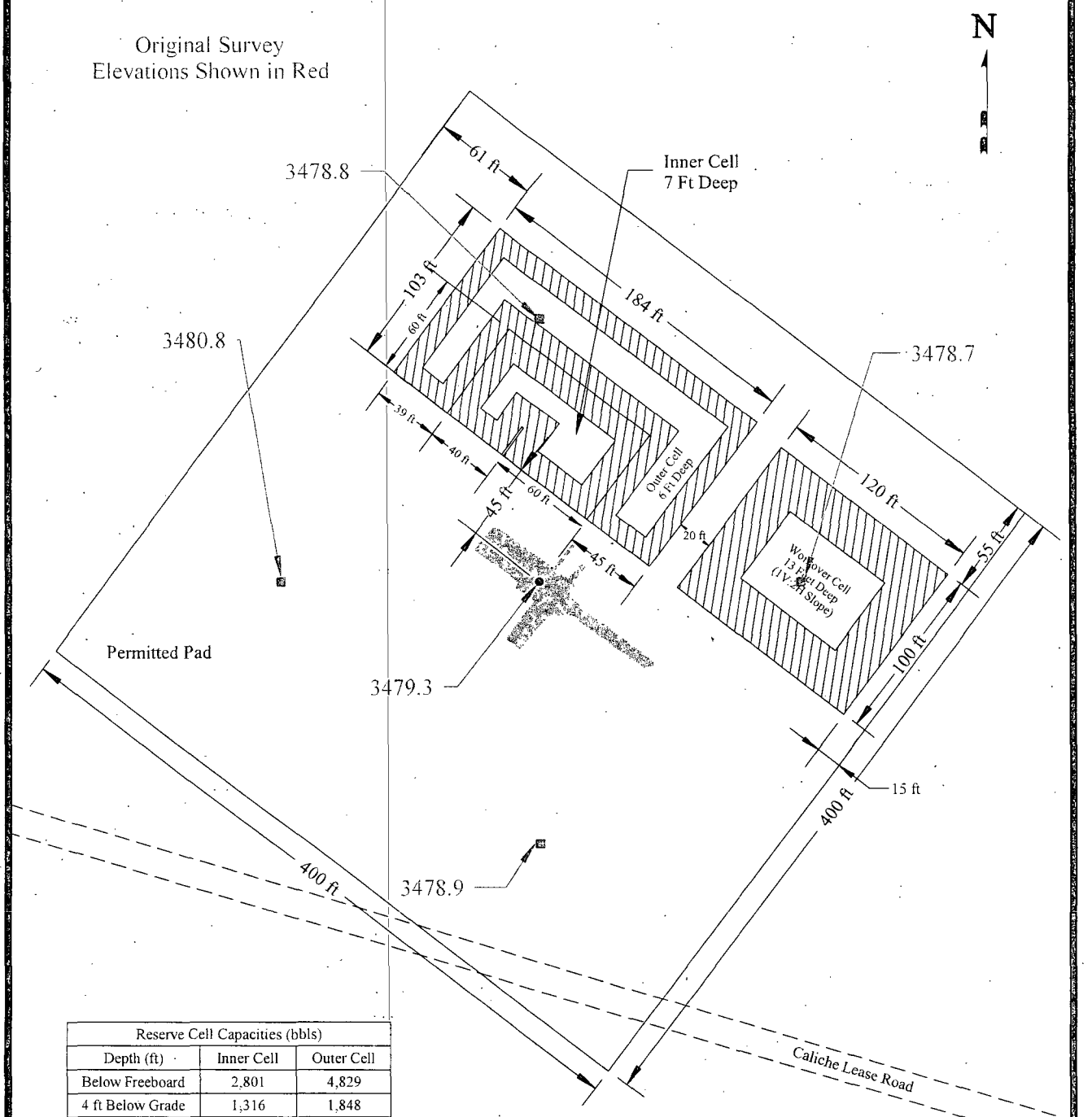
**MAP NUMBER**
**35015C0625D**

**EFFECTIVE DATE**
**JUNE 4, 2010**

**Federal Emergency Management Agency**

# Site Specific Information Plates

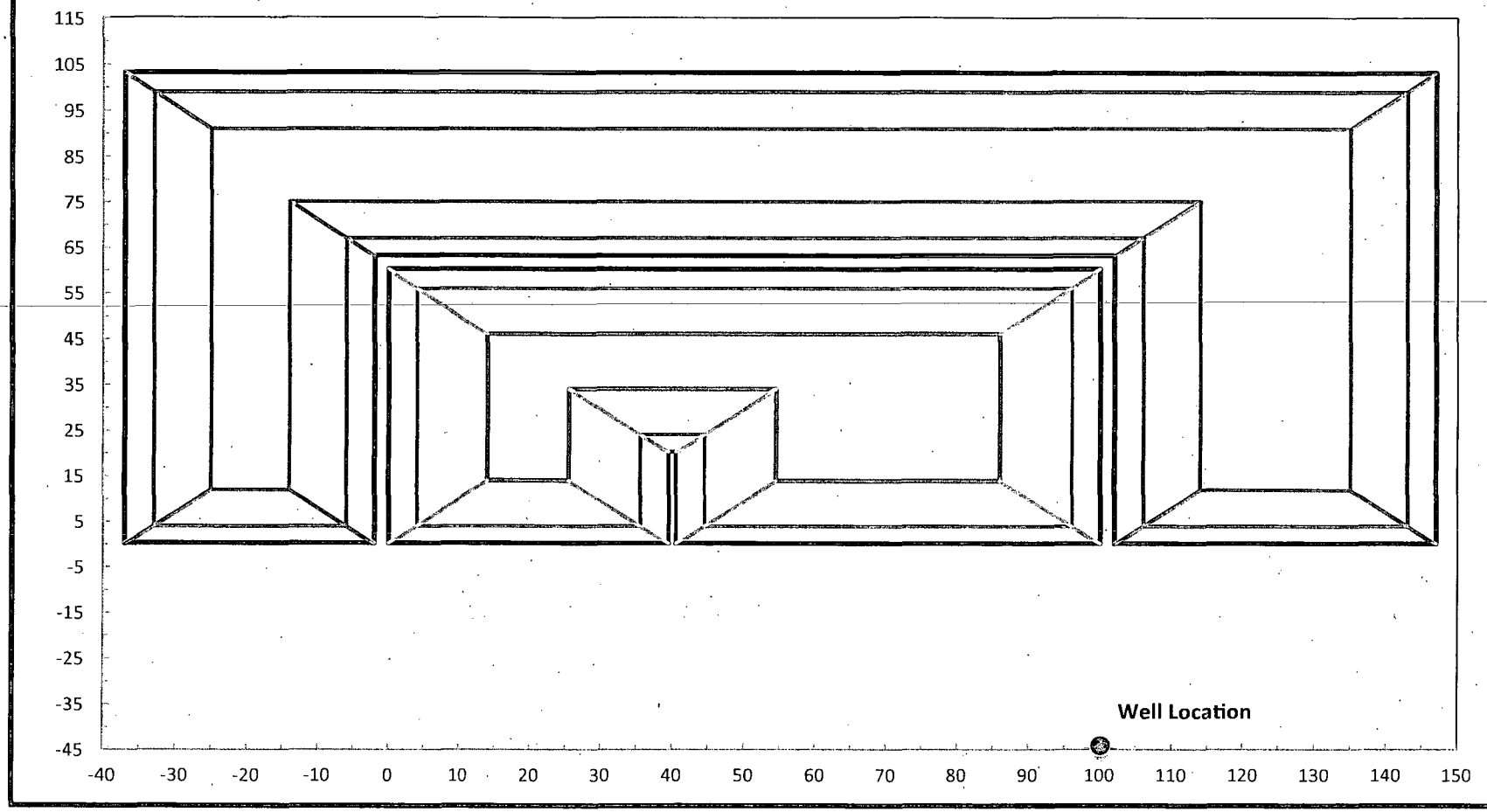
**R.T. Hicks Consultants, Ltd.**
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104




| Reserve Cell Capacities (bbls) | | |
|---|---|---|
| Depth (ft) | Inner Cell | Outer Cell |
| Below Freeboard | 2,801 | 4,829 |
| 4 ft Below Grade | 1,316 | 1,848 |

| Workover Cell Capacities | |
|---|---|
| Depth (ft) | Barrels |
| Below Freeboard | 12,659 |
| 4 ft Below Grade | 3,920 |

| | | |
|---|---|---|
| RT Hicks Consultants, Ltd. | War Horse Federal Com. #3H | Plate 1 |
| | Murchison Oil and Gas, Inc. | October 2012 |




| | | |
|---|---|---|
| **R.T. Hicks Consultants**<br>901 Rio Grande Blvd. NW<br>Suite F-142<br>Albuquerque, N. M. 87104 | **Double Horseshoe Reserve Cells** | **Plate 2** |
| | **Murchison Oil & Gas - War Horse Federal Com No. 3H** | **Oct-12** |

Width refers to East-West dimensions.
Length refers to North-South dimensions.

| | | | |
|---|---|---|---|
| **Overall Pit Dimensions** | Total Width of both Cells | **184.0** | [feet] |
| | Toal Length of both Cells | **103.0** | |
| | Rise over Run for all slopes | **2.0** | [-] |

| | | | |
|---|---|---|---|
| **Inner Horseshoe Pit Dimensions** | Width of Inner Horseshoe Cell | **100.0** | [feet] |
| | Length of Inner Horseshoe Cell | **60.0** | |
| | Depth of Inner Horseshoe Cell | **7.0** | |
| | Inner Horseshoe Cell Floor "width" (North to South) | **11.0** | [feet] |
| | Inner Horseshoe Pit Floor "width" (East to West) | **11.0** | |
| | Width of Inner Horseshoe Divider on the ground surface | **1.0** | [feet] |
| | Length of Inner Horseshoe Divider on the ground surface | **20.0** | |
| | Distance from SW corner of Inner Horseshoe Cell to Inner Divider Axis | **40.0** | |

| | | | |
|---|---|---|---|
| **Divider Dimensions** | Width of Divider between Inner and Outer Horseshoe Cells | **3.0** | [feet] |

| | | | |
|---|---|---|---|
| **Outer Horseshoe Pit Dimensions** | Length of Outer Horseshoe Cell (East Side) | **103.0** | [feet] |
| | Width of Outer Horseshoe Cell (East Side) | **45.0** | |
| | Depth of Outer Horseshoe Cell (East Side) | **6.5** | |
| | Length of Outer Horseshoe Pit (West Side) | **103.0** | [feet] |
| | Width of Outer Horseshoe Cell (West Side) | **35.0** | |
| | Depth of Outer Horseshoe Cell (West Side) | **7.5** | |
| | Length of Outer Horseshoe Cell (North Side) | **40.0** | [feet] |
| | Width of Outer Horseshoe Cell (North Side) | **184.0** | |
| | Depth of Outer Horseshoe Cell (North Side) | **8.5** | |
| | "Average Width" of Outer Horseshoe Cell Floor (East to West dimension) | **11.0** | [feet] |
| | "Average Width" of Outer Horseshoe Cell Floor (North to South dimension) | **16.0** | |

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Suite F-142
Albuquerque, N. M. 87104

**Double Horseshoe Reserve Cells** | **Plate 3**

**Murchison Oil & Gas - War Horse Federal Com No. 3H** | **Oct-12**

# Appendix SSI-A

## Summary of Groundwater Data From NMBMMT Open File Report 95 & USGS Database

**R.T. Hicks Consultants, Ltd.**
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

# Appendix SSI-A

**Summary of Groundwater Data from NMBMMT Open File Report 95 and USGS Data Used to Create Figure 2a and 2b**

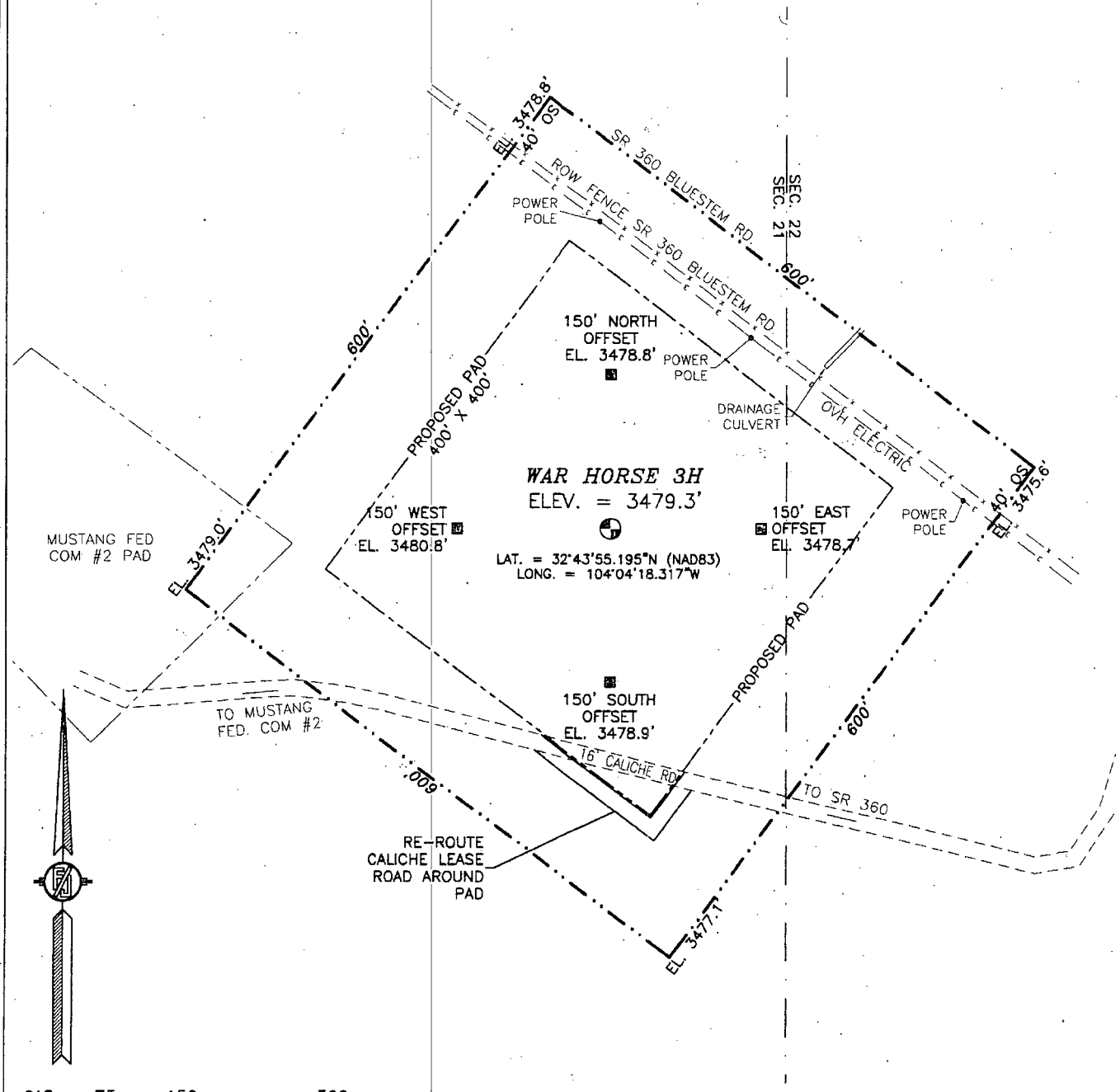
| Well Numbers (see Map) | Well Location | | | | | | Well Source Information | | | | | | Groundwater Elevation Data | | | | | | Gauging Date |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Township (south) | Range (east) | Section | Quarter Section (64, | 16, | 4) | NM-OSE Database | USGS Database | Open File Rpt. 95 | USGS Topo Sheet | Aerial Photograph | Field Verification | Surface Elevation (published) | Surface Elevation (Topo Sheet) | Well Total Depth (published) | Depth to Water (published) | Groundwater Elev. (published) | Groundwater Elev. (using topo elev.) | |
| Misc - 19 | 16 | 27 | 36 | 2 | 1 | 2 | | | ✓ | ✓ | -- | -- | 3,454 | 3,454 | 61.4 | 47.1 | 3,407 | 3,407 | 10/13/77 |
| RA 07774 | 17 | 27 | 11 | 3 | 2 | 1 | ✓ | | | ✓ | ✓ | ✓ | | 3,401 | 100 | 50 | | 3,351 | 12/20/89 |
| USGS-1344 | 17 | 27 | 11 | 2 | 2 | 1 | | ✓ | | ✓ | ✓ | ✓ | 3,390 | | 100 | 54.3 | 3,336 | | 1/30/06 |
| Misc - 20 | 17 | 27 | 12 | 3 | 1 | 4 | | | ✓ | | | | Could not identify current or historic location | | | | | | |
| Misc - 5 | 17 | 28 | 2 | 2 | 4 | 2 | | | ✓ | | ✓ | ✓ | | 3,590 | | 27.6 | 3,560 | 3,562 | 1/1/48 |
| Misc - 35 | 17 | 28 | 2 | 4 | 2 | 4 | | | | | ✓ | ✓ | | 3,574 | | 35.8 | | 3,538 | 9/6/12 |
| Misc - 2 | 17 | 28 | 14 | | 2 | 2 | | | ✓ | ✓ | ✓ | -- | | 3,590 | | 80 | 3,540 | 3,510 | Pre 1978 |
| Misc - 16 | 17 | 28 | 19 | | | 2 | | | ✓ | ✓ | ✓ | ✓ | | 3,591 | | 224.3 | 3,380 | 3,367 | 1/2/48 |
| Misc - 17 | 17 | 28 | 22 | | 3 | 2 | | | ✓ | ✓ | ✓ | ✓ | -- | 3,579 | | 45.5 | 3,520 | 3,534 | 1/1/48 |
| USGS-1222 | 17 | 28 | 22 | 4 | 2 | 4 | | ✓ | | ✓ | ✓ | ✓ | 3,578 | | 95 | 78.6 | 3,499 | | 1/13/99 |
| Misc - 1 | 17 | 28 | 24 | 2 | 2 | 2 | | | ✓ | | | | Could not identify current or historic location | | | | | | |
| Misc - 0 | 17 | 29 | 8 | 2 | 3 | 1 | | | ✓ | ✓ | ✓ | ✓ | 3,617 | 3,617 | 92.7 | 90.1 | 3526.9 | | 10/14/77 |
| Misc - 3 | 17 | 29 | 22 | 1 | 1 | 1 | | | ✓ | ✓ | ✓ | ✓ | 3,550 | 3,545 | | 79.7 | 3,470 | 3,465 | 11/29/48 |
| Misc - 36 | 17 | 29 | 29 | 4 | 4 | 4 | | | ✓ | ✓ | ✓ | ✓ | | 3,545 | | 102.4 | | 3442.6 | 10/4/12 |
| USGS-949 | 18 | 28 | 21 | 1 | 2 | 2 | | ✓ | | ✓ | ✓ | -- | 3,580 | 3,582 | 250 | 225.24 | 3,355 | 3,357 | 2/19/99 |
| Misc - 26a | 18 | 29 | 24 | 1 | 1 | 3 | | | ✓ | ✓ | ✓ | ✓ | 3,430 | 3,436 | | 158.3 | 3,272 | 3,278 | 4/28/50 |
| Misc - 26b | 18 | 29 | 24 | 1 | 1 | 3 | | | ✓ | ✓ | ✓ | ✓ | 3,436 | 3,436 | | 156.44 | 3,280 | 3,280 | 10/18/77 |
| Unnamed | 18 | 29 | 34 | | | | | | ✓ | | | | Could not identify current or historic location | | | | | | |
| Misc - 28 | 18 | 30 | 32 | 3 | 2 | 4 | | | ✓ | | | -- | 3,380 | | | 161.28 | 3,219 | | 4/8/71 |
| Misc - 27 | 18 | 30 | 32 | 4 | 2 | 3 | | | ✓ | ✓ | ✓ | -- | 3,370 | 3,368 | 266 | 158.77 | 3,211 | 3,209 | 10/18/77 |
| USGS-888 | 19 | 28 | 9 | 3 | 1 | 3 | | ✓ | | ✓ | ✓ | -- | 3,549 | 3,549 | 365 | 246.38 | 3,303 | 3,303 | 2/19/99 |
| USGS-875 | 19 | 29 | 13 | 2 | 1 | 4 | | ✓ | | | ✓ | -- | 3,309 | | 120 | 101.22 | 3,208 | | 1/20/99 |

✓ Indicates well was verified, (blank) indicates well not verified, and -- indicates no attempt to verify

# Survey Information

**R.T. Hicks Consultants, Ltd.**
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

# SECTION 21, TOWNSHIP 18 SOUTH, RANGE 29 EAST, N.M.P.M.
# EDDY COUNTY, STATE OF NEW MEXICO




015 75 150 300

SCALE 1" = 150'

**DIRECTIONS TO LOCATION**

FROM THE INTERSECTION OF CR 217 (HAGERMAN CUTOFF) AND SR 360 (BLUESTEM) GO SOUTH ON SR 360 1.9 MILES TO CALICHE LEASE ROAD WITH CATTLE CUARD ON RIGHT GO WEST ON CALICHE ROAD ABOUT 200 FT. TO CALICHE ROAD ON RIGHT GO NORTH 0.1 MILES SITE IS ABOUT 170 FT ON RIGHT (NORTH)

## MURCHISON OIL & GAS, INC.
## WAR HORSE 3H

LOCATED 2290 FT. FROM THE SOUTH LINE AND 175 FT. FROM THE EAST LINE OF SECTION 21, TOWNSHIP 18 SOUTH, RANGE 29 EAST, N.M.P.M. EDDY COUNTY, STATE OF NEW MEXICO

SEPTEMBER 24, 2012

SURVEY NO. 1245A

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

# Generic Plans for Temporary Pits

**R.T. Hicks Consultants, Ltd.**
901 Rio Grande Blvd. NW, Suite F-142
Albuquerque, NM 87104

# Temporary Pit Design Plan

Plates 1, 2, and 3 show the design of the temporary pit proposed for this project. Field conditions and the drilling rig layout will determine the final configuration of the pit cells, which will consists of the following:

1. A cell for drilling fluid circulation and cuttings storage
2. A cell for the storage of fresh water (drilling/stimulation) and stimulation flow-back water prior to re-use or disposal

In addition to the commitments listed below, the operator will install a system that can drain water entrained in the drilling waste of the drilling pit. As described in the closure plan, this system of filtered perforated pipe and drainage mats cover much of the bottom of the drilling cell of the pit – the cut brine cell and the inner cell. The system will drain to the lowest corner of each cell, generally near the suction area. The exact location will be determined upon completion of the cells. Standpipes rise from the depression and house a solar-powered pump. The drainage system for the cut brine cell removes water to the brine cell via the solar pumps. This water can be placed in an above-ground tank or the fluids cell of the pit for temporary storage before re-use or disposal. The drainage system in the brine cell may also be used to introduce water below the residual cuttings/mud, causing the introduced fluid to move upwards through the cuttings/mud and enhance the solids rinsing process. Introduced water to the brine cell (which will become cut brine or saturated brine after movement through the cuttings) can be removed from the pit for re-use via a vacuum truck or recovered from the drainage system at the bottom.

The temporary storage of fluids, fluid reuse or fluid disposal will be conducted in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment. This drainage and rinsing system allows the operator to:

- Recover clear water for possible re-use,
- Reduce the concentration of constituents of concern in the drilling waste by removing some water entrained in the drilling waste.

Precipitation and the possible addition of relatively fresh water (see closure plan) will rinse the solid drilling waste, causing additional reduction in the constituents of concern as the water is recovered for re-use or disposal.

For any temporary storage of fluids derived from the drilling pit and placed in an above-ground tank, the following will apply:

1. Construction, operation and maintenance of the temporary storage tank(s) will adhere to all applicable NMOCD Rules including but not limited to:
    a. Safety stipulations
    b. Protection from hydrogen sulfide mandates
    c. Signage and identification requirements
    d. Secondary containment requirements for temporary tanks

e. Applicable netting requirements

2. Any cleaning of the temporary tank(s) will adhere to NMOCD Rules relating to tank cleaning.
3. Transportation of water or drilling fluids derived from the drilling pit will adhere to all applicable NMOCD Rules relating to transportation.
4. Storage of water or drilling fluids in temporary above-ground tanks will also adhere to all applicable Federal mandates.

During final closure of the pit, the tanks and secondary containment system will be removed from the location and the area beneath the tank inspected for any leakage. If any leakage is suspected, the operator will sample the soil beneath the tanks and report any release pursuant to NMOCD Rules.

Finally, we intend to place any temporary tank used in conjunction with the pit drainage system on a 20-mil liner with a berm around it that would allow any inadvertently released fluids to drain or be pumped back into the pit.

## *Construction/Design Plan of Temporary Pit*

1. The operator or qualified contractor will design and construct the pit to contain liquids and solids and prevent contamination of fresh water and protect public health and the environment.
2. Prior to constructing the pit the operator or qualified contractor will strip and stockpile the topsoil for use as the final cover or fill at the time of closure.
3. The operator will post an upright sign in compliance with 19.15.16.8 NMAC. The operator will post the sign in a manner and location such that a person can easily read the legend. The sign will provide the following information: the operator's name; the location of the site by quarter-quarter or unit letter, section, township and range; and emergency telephone numbers.
4. The operator will fence the pit in a manner that prevents unauthorized access and will maintain the fences in good repair. The operator will fence the pit to exclude livestock with a four-foot fence that has at least four strands of barbed wire evenly spaced in the interval between one foot and four feet above ground level. The pit will be completely fenced at all times excluding drilling and workover operations. During drilling or workover operations, the operator is not required to fence the edge of the pit adjacent to the drilling or workover rig.
5. The operator will design and construct the temporary pit to prevent unauthorized releases and ensure the confinement of liquids.
6. The temporary pit will have a properly constructed foundation and interior slopes consisting of a firm, unyielding base, smooth and free of rocks, debris, sharp edges or irregularities to prevent the liner's rupture or tear.
7. The slopes of the pit will be no steeper than two horizontal feet to one vertical foot (2H:1V). Unless an alternate slope, protective to fresh water, public health and the environment, is proposed and approved by the appropriate division district office.
8. As an additional engineering control to address any concerns relating to the potential presence of karst and associated instability, during construction of the pit the contractor

will compact the earth material that forms the foundation for the pit liner. An expected proctor density of greater than 90% will be achieved by

a. Adding water to the earth material as appropriate,
b. Compacting the earth by walking a crawler-type tractor down the sides and bottom of the pit
c. Repeating this process with a second 6-inch lift of earth material if necessary

9. The operator will design and construct the temporary pit with a geomembrane liner. The geomembrane liner will consist of 20-mil string reinforced LLDPE or equivalent liner material that the appropriate division district office approves. The geomembrane liner will be composed of an impervious, synthetic material that is resistant to petroleum hydrocarbons, salts and acidic and alkaline solutions. The liner material will be resistant to ultraviolet light. Liner compatibility will comply with EPA SW-846 method 9090A.
10. The operator will minimize liner seams and orient them up and down, not across a slope. The operator will use factory-welded seams. Prior to any field seaming, the operator will overlap liners four to six inches and orient seams parallel to the line of maximum slope, *i.e.*, oriented along, not across, the slope. The operator will minimize the number of welded field seams in corners and irregularly shaped areas. Qualified personnel will weld Field seams.
11. Construction will avoid excessive stress-strain on the liner.
12. Geotextile will be placed under the liner where needed to reduce localized stress-strain or protuberances that may otherwise compromise the liner's integrity.
13. The operator and/or qualified contractor retained by the operator will anchor the edges of all liners in the bottom of a compacted earth-filled trench. The anchor trench will be at least 18 inches deep.
14. The operator and/or qualified contractor retained by the operator will ensure that the liner is protected from any fluid force or mechanical damage at any point of discharge into or suction from the lined temporary pit.
15. The operator and/or qualified contractor retained by the operator will design and construct the temporary pit to prevent run-on of surface water. As necessary, a berm or ditch will surround the temporary pit to prevent run-on of surface water.
16. The volume of the temporary pit (fluids cell plus drilling cell), including freeboard, does not exceed 10 acre-feet (77,583 bbls).

# Temporary Pit Operating and Maintenance Plan

The operator will operate and maintain the pit to contain liquids and solids and maintain the integrity of the liner, liner system, or any secondary containment system to prevent contamination of fresh water and protect public health and the environment as described below:

1. If feasible, the operator will recycle, reuse or reclaim of all drilling fluids and recovered water in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment. Specifically, drilling fluids and reclaimed water will be transferred to other drilling operations for use (see closure plan).
2. If re-use is not possible, fluids will be sent to disposal at division-approved facility.
3. Reuse or disposal of fluids from the pit will be conducted in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment.
4. The operator will not discharge into or store any hazardous waste in the pit.
5. If any pit liner's integrity is compromised, or if any penetration of the liner occurs above the liquid's surface, then the operator will notify the appropriate division district office within 48 hours (phone or email) of the discovery and repair the damage or replace the liner.
6. If the pit develops a leak or if any penetration of the pit liner occurs below the liquid's surface, then the operator will remove all liquid above the damage or leak line within 48 hours, notify the appropriate district office within 48 hours (phone or email) of the discovery and repair the damage or replace the pit liner.
7. The injection or withdrawal of liquids from the pit will be accomplished through a header, diverter or other hardware that prevents damage to the liner by erosion, fluid jets or impact from installation and removal of hoses or pipes.
8. The operator will install diversion ditches and berms around the pit as necessary to prevent the collection of surface water run-on.
9. The operator will immediately remove any visible layer of oil from the surface of the temporary pit and maintain on site an oil absorbent boom to contain and remove oil from the pit's surface.
10. Only fluids used or generated during the drilling or workover process will be discharged into the temporary pit. The discharge of workover fluids to the drilling pit as a rinse to the drilling waste solids is discussed in the closure plan (below).
11. The operator will maintain the temporary pit free of miscellaneous solid waste or debris.
12. Although hydrocarbon-based drilling mud is not anticipated for use, the operator will use a tank made of steel to contain hydrocarbon-based drilling fluids if need be.
13. Immediately after cessation of drilling, the operator will remove any visible or measurable layer of oil from the surface of a drilling pit, in the manner described above.
14. The operator will maintain at least two feet of freeboard for the temporary pit.
15. The operator will inspect the temporary pit containing drilling fluids at least daily while the drilling rig is on-site to ensure compliance with this plan.
16. After drilling operations, the operator will inspect the temporary drilling pit weekly so long as liquids remain in the temporary pit.

17. The operator will maintain a log of such inspections and make the log available for the appropriate district office's review upon request.
18. The operator will file a copy of the log with the appropriate division district office when the operator closes the temporary pit.
19. The operator will remove all free liquids from the temporary pit within 30 days from the date that the operator releases the drilling rig – unless granted an extension of time by the District Office. The operator will note the date of the drilling rig's release on form C-105 or C-103 upon well completion.

# Temporary Pit Closure Plan

## *Protocols and Procedures*

The operator will use the following procedures and protocols to implement the closure:

- The operator will notify the surface owner by certified mail, return receipt requested, prior to closure, that the operator plans to close the temporary pit.
- The operator of the temporary pit will notify the applicable division district office verbally or by email at least 72 hours, but not more than one week, prior to any closure operation. The notice will include the operator's name and the location to be closed by unit letter, section, township and range, well's name, number, the API number.
- The operator of the temporary pit will remove all liquids from the temporary pit prior to closure and either:
  - Dispose of the liquids in a division-approved facility, or
  - Recycle, reuse or reclaim the liquids for use in drilling another well.
- Fluids on and entrained in the drilling waste will be removed from the pit for re-use or disposal.
- The operator may request extensions of time for the pit to hold free liquids as extensions may be necessary to allow the addition of water to the outer horse shoe of the pit to cause rinsing of solid waste and removal of constituents of concern via the pit drainage system to the inner shoe then to an above-ground tank (or truck) or to the fluids cell of the temporary pit. Sources of water for rinsing the solid drilling waste in the outer horse shoe include:
  - Residual fresh water in the workover cell not used for hydraulic fracturing (removed from the workover cell prior to the introduction of flow-back)
  - Flow-back of water pumped down hole during hydraulic fracturing that is less than 50% of the estimated TDS of pit pore water based on field conductance or specific gravity measurements[1].
- Fluids pumped from the outer horseshoe drainage system are transferred to the inner shoe drainage system causing relatively low salinity water to move up through the cuttings, dissolving the rock salt cuttings.
- When the inner shoe contains at least 130 barrels of clear water (one water truck load), the brine or cut brine can be removed for re-use in drilling operations or sent to disposal.
- The operator shall remove all free liquids from the temporary pit within 30 days from the date that the operator released the drilling rig. The operator shall note the date of the drilling rig's release on form C-105 or C-103 upon well completion. The operator will request an extension of up to three months from the appropriate division district office if necessary to allow for rinsing of drilling waste solids and the recovery of water for re-use.

[1] If water pumped from the pit drainage system prior to stimulation is 9.5 pounds/gallon and distilled water is 8.3 pounds per gallon, discharge to the outer shoe ceases when measurements of flow back are 8.9 pounds/gallon or less

- After removal of all standing water, cuttings rinsing ceases and drilling cell drainage begins as:
    - Water from the outer horseshoe drainage system discharges to the surface of the inner shoe
    - Solar pumping from the inner shoe drainage system transfers water to an above-grade tank or the fluids cell of the temporary pit
- Fluids drained from the cell are temporarily stored in the above-ground tank or fluids cell and are removed for re-use or disposal. Both temporary storage of fluids from the pit and reuse or disposal will be conducted in a manner approved by division rules that prevents the contamination of fresh water and protects public health and the environment.
- The operator will close the temporary pit within six months of the date that the operator releases the drilling rig. An extension not to exceed three months may be requested of the applicable district office.
- The operator will close the pit by an earlier date that the division requires because of imminent danger to fresh water, public health or the environment.
- Within 60 days of closure completion, the operator will submit a closure report on form C-144, with necessary attachments to document all closure activities including sampling results; information required by 19.15.17 NMAC; a plot plan; and details on back-filling, capping and covering, where applicable.
- In the closure report, the operator will certify that all information in the report and attachments is correct and that the operator has complied with all applicable closure requirements and conditions specified in the approved closure plan.
- The operator will provide a plat of the pit location on form C-105 with the closure report within 60 days of closing the temporary pit.

### *Additional Protocols and Procedures for On-Site Closure*

- The operator has provided the surface owner notice of the operator's proposal of an on-site closure (see transmittal letter for proof of notice to the landowner) as required in 19.15.17.13.F(1)(b).
- Upon receipt of NMOCD approval for on-site closure (in-place burial,), the operator will notify the surface owner by certified mail, return receipt requested, that the operator plans to close the pit and where the operator has approval for on-site closure. Evidence of mailing of the notice will demonstrate compliance with this requirement.
- The operator will place a steel marker at the center of an on-site burial (unless the surface owner requires an alternative marker that is acceptable to the appropriate division district office). The steel marker will be not less than four inches in diameter and will be cemented in a three-foot deep hole at a minimum. The steel marker will extend at least four feet above mean ground level and at least three feet below ground level. The operator name, lease name and well number and location, including unit letter, section, township and range, and that the marker designates an on-site burial location will be welded, stamped or otherwise permanently engraved into the metal of the steel marker.

- The operator will report the exact location of the on-site burial on form C-105 filed with the division.
- If the State of New Mexico or the Federal government owns the land surface, no deed exists, the land is held in trust. Therefore, the operator cannot file a deed notice identifying the exact location of the on-site burial with the county clerk in the county. The exact location of the on-site burial will be transmitted to the surface owner by copy of the form C-105 discussed above.
- If the surface is not in the public domain, the operator will file a deed notice identifying the exact location of the on-site burial with the county clerk in the county. The exact location of the on-site burial will be transmitted to the surface owner by copy of the form C-105 discussed above.

In-place closure is the preferred closure alternative for the temporary pit. If waste sampling results suggest that standards for in-place closure are not met for the entire drilling cell (inner horseshoe and outer horseshoe), the operator will implement excavation and removal as described in later sections of this plan

### *Site Reclamation Plan*

After the operator has closed the pit, the operator will reclaim the pit location and all areas associated with the pit, including associated access roads to a safe and stable condition that blends with the surrounding undisturbed area. The operator will substantially restore the impacted surface area to the condition that existed prior to oil and gas operations by placement of the soil cover as provided in Subsection H of 19.15.17.13 NMAC, re-contour the location and associated areas to a contour that approximates the original contour and blends with the surrounding topography and re-vegetate according to Subsection I of 19.15.17.13 NMAC.

### *Soil Cover Design Plan*

If the operator removes the pit contents or remediates any contaminated soil to the division's satisfaction the soil cover will consist of the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater.

The soil cover for the in-place burial will consist of a minimum of four feet of compacted, non-waste containing, earthen material. The soil cover will include either the background thickness of topsoil or one foot of suitable material to establish vegetation at the site, whichever is greater.

The operator will construct the soil cover to the site's existing grade and prevent ponding of water and erosion of the cover material.

### *Re-vegetation Plan*

1. The first growing season after the operator closes the pit, including access roads; the operator will seed or plant the disturbed areas.
2. The operator will accomplish seeding by drilling on the contour whenever practical.
3. The operator will obtain vegetative cover that equals 70% of the native perennial vegetative cover (un-impacted by overgrazing, fire or other intrusion damaging to native vegetation).
4. In the absence of specific guidance from the surface owner, the operator will follow BLM mandates for the seed mixture not including noxious weeds, and maintain that cover through two successive growing seasons. The operator will notify NMOCD of the specific mixture prior to seeding.
5. During the two growing seasons that prove viability, there will be no artificial irrigation of the vegetation.
6. The operator will repeat seeding or planting until it successfully achieves the required vegetative cover.
7. If conditions are not favorable for the establishment of vegetation, such as periods of drought, the operator may request that the division allow the operator to delay seeding or planting until soil moisture conditions become favorable or may require the operator to use additional cultural techniques such as mulching, fertilizing, irrigating, fencing or other practices.
8. The operator will notify the division when it has seeded or planted and when it successfully achieves re-vegetation.

## In-place Closure Plan

In the event that sampling of the drilling waste suggests that the inner and outer horseshoe of the drilling cell meet the criteria for in-place closure, the operator will proceed with in-place closure for one or both cells (inner and outer horseshoe).

### *Siting Criteria Compliance Demonstration for In-Place Burial*

The Siting Criteria Compliance Demonstration for the temporary pit show that the requirements of 19.15.17.10 NMAC are met for in-place closure.

### *Waste Material Sampling Plan for In-place Burial*

The operator will collect at a minimum, a five-point, composite sample of the contents of the temporary pit after treatment or stabilization.

The purpose of the sampling after the waste material is stabilized is to demonstrate that:

- Benzene, as determined by EPA SW 846 method 8021B or 8260B, does not exceed the concentration limit for in-place burial;
- Total BTEX, as determined by EPA SW-846 method 8021B or 8260B, does not exceed the concentration limit for in-place burial;
- The GRO and DRO combined fraction, as determined by EPA SW-846 method

- 8015M, does not exceed the concentration limit for in-place burial;
- TPH, as determined by EPA method 418.1 does not exceed the concentration limit for in-place burial;
- Chloride, as determined by EPA method 300.1, does not exceed the concentration limit for in-place burial or the background concentration, whichever is greater.
- The Stabilized waste passes the paint filter liquids test (EPA SW-846, method 9095)

### *Protocols and Procedures for In-Place Burial*

In addition to the General Conditions Protocols and Procedures and the Additional Protocols and Procedures for On-site Closure listed above, the operator will execute the following steps for in-place closure of the pit:

A. The operator will measure the distance between the top of the drilling waste and existing grade to determine if stabilized drilling waste (see stabilization methods, below) will be at least 4-feet below existing grade to allow installation of the soil cover (see soil cover design, above).
B. The operator will stabilize or solidify the contents of the pit to a bearing capacity sufficient to support the temporary pit's final cover. However, the operator will not mix the pit contents with soil or other material at a mixing ratio of greater than 3:1, (3 parts soil or other material to 1 part drilling waste).
C. Specifically, the drilling waste will be stabilized in the cell by adding no more than 3 parts clean fill derived from the excavation of the pit to 1 part drilling waste.
D. After stabilization such that the waste material will support the soil cover, the mixture will be re-sampled (as necessary) pursuant to NMOCD Rules (see above).
E. If sample results show that stabilized waste in the inner and outer horse shoe of the cell satisfy the regulatory standards for in-place burial, the operator will measure the distance between the stabilized waste and existing grade and, if necessary, transfer stabilized waste from one shoe to the other to allow for placement of the soil cover (see design criteria, above).
F. Cover the geomembrane lined, filled, temporary pit with compacted, non-waste containing, earthen material; construct a division-prescribed soil cover; recontour and re-vegetate the site as described in this plan. Specifically, a 4-foot thick soil cover consistent with NMOCD Rules will be placed over the stabilized waste.
G. If necessary to meet the other mandates of NMOCD Rules (e.g placement of a 4-foot soil cover to existing grade) and this closure plan, the stabilized drilling waste in the inner horseshoe will be excavated and placed in the outer horseshoe. The operator will implement confirmation sampling consistent with excavation and removal (see below) if this option is exercised on the inner horseshoe. This process would be conducted according to applicable regulations as described below, not allowing waste stabilization to exceed a 3:1 mixing ratio (3 parts soil or other material to 1 part drilling waste), testing

stabilized waste to demonstrate compliance with in-place burial standards as required, sampling to confirm no release has occurred beneath the inner horseshoe.

H. Any excess liner above the stabilized waste will be removed for re-use or disposal.

# Excavation and Removal Closure Plan

IF THE CRITERIA FOR ON-SITE CLOSURE (IN-PLACE BURIAL) FOR SOME OR ALL OF THE TEMPORARY PIT ARE NOT MET, THE OPERATOR WILL ADHERE TO NMOCD RULES AND IMPLEMENT THE FOLLOWING ACTIONS FOR ONLY THE MATERIALS THAT DO NOT MEET CRITERIA FOR IN PLACE CLOSURE:

## *Protocols and Procedures for Excavation and Removal*

The operator will close the temporary pit by excavating the drilling waste that does not meet the criteria for in-place closure (e.g. solids in the inner shoe) and any synthetic pit liners that cannot be re-used and transferring those materials to one of the division-approved facilities listed below:

| | |
|---|---|
| Controlled Recovery, Inc. | NM-01-0006 |
| Lea Land, LLC | NM-01-0035 |

If the sampling program described below demonstrates that a release has not occurred or that any release does not exceed the concentrations specified in Subparagraph (b.ii) of Paragraph (1) of Subsection B of 19.15.17.13 NMAC, then the operator will:

1. Backfill the temporary pit excavation with compacted, non-waste containing, earthen material;
2. Construct a division-prescribed soil cover to existing grade as described in the Soil Cover Plan (above);
3. Re-contour and re-vegetate the site as described in the Re-vegetation Plan (above).

## *Confirmation Sampling Plan for Excavation and Removal*

The operator will test the soils beneath the temporary pit after excavation to determine whether a release has occurred. To determine if a release has occurred, the operator and/or qualified contractor will collect, at a minimum:

- A five-point, composite sample
- Individual grab samples from any area that is wet, discolored or showing other evidence of a release

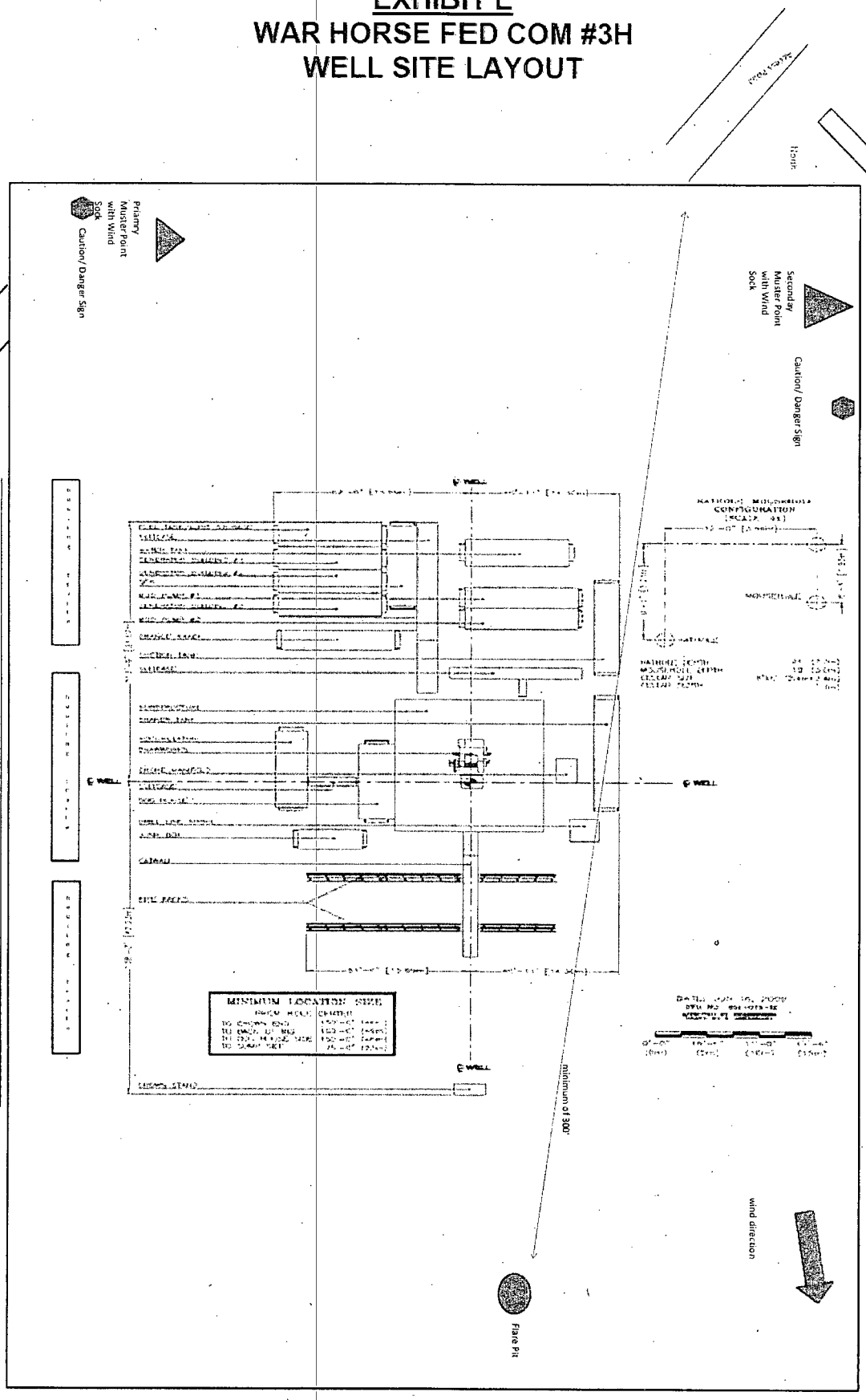
The purpose of this sampling is to demonstrate that:

- Benzene, as determined by EPA SW-846 method 8021B or 8260B does not exceed concentration limits of the Rule;
- Total BTEX, as determined by EPA SW-846 method 8021B or 8260B does not exceed concentration limits of the Rule;
- The GRO and DRO combined fraction, as determined by EPA SW-846 method 8015M, does not exceed concentration limits of the Rule;
- The TPH, as determined by EPA method 418.1 does not exceed 2,500 mg/kg; and
- Chloride, as determined by EPA method 300.1, does not exceed concentration limits of the Rule or the background concentration, whichever is greater.

### *Reporting*

The operator shall notify the division of its results on form C-141. If the operator or the division determines that a release has occurred, then the operator will comply with 19.15.29 NMAC and 19.15.30 NMAC, as appropriate.

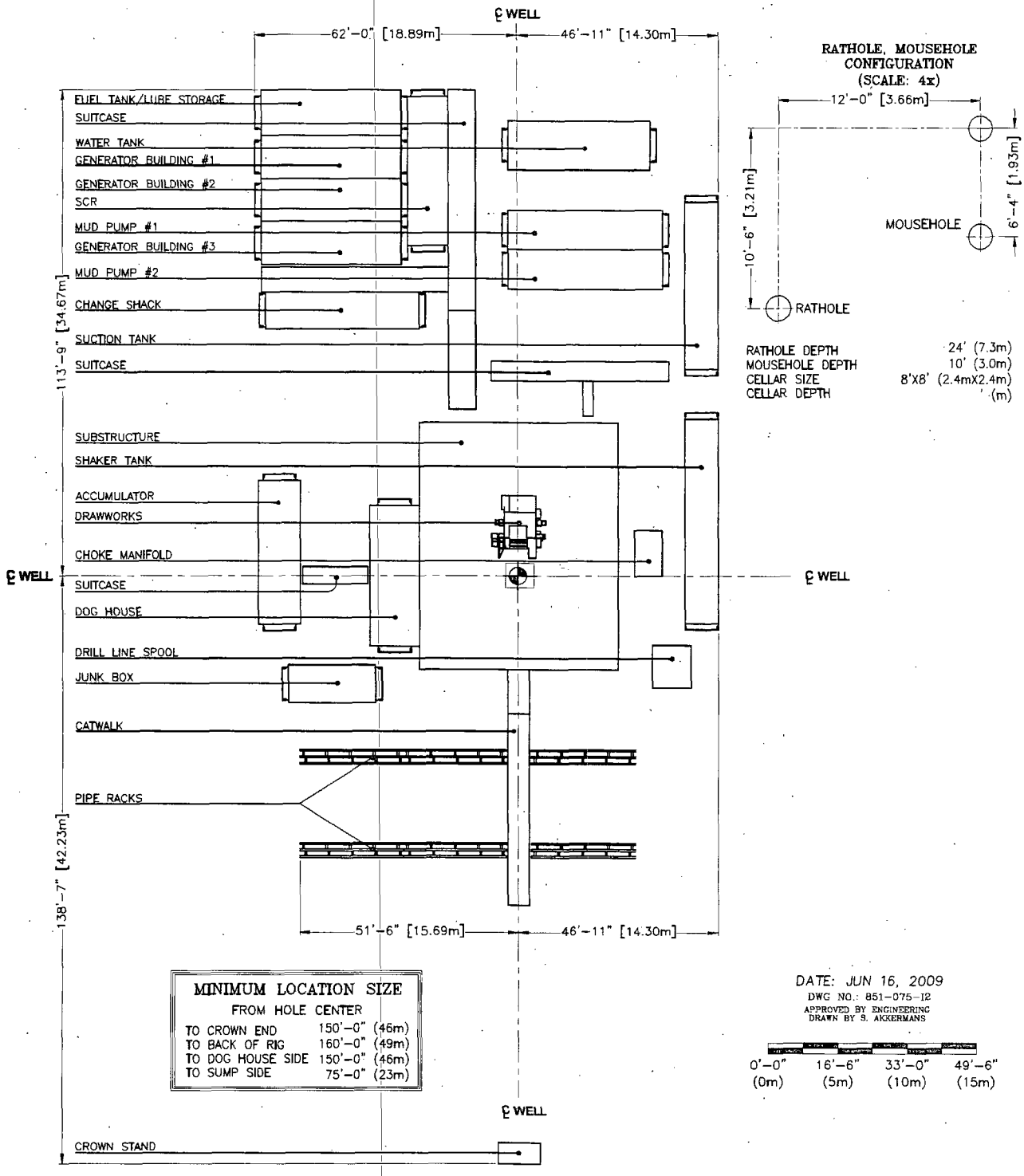
# EXHIBIT E
# WAR HORSE FED COM #3H
# WELL SITE LAYOUT




War Horse Federal Com #3 - Rig Layout

# RIG LAYOUT

# RIG 075TE




RATHOLE, MOUSEHOLE CONFIGURATION
(SCALE: 4x)




| | |
|---|---|
| RATHOLE DEPTH | 24' (7.3m) |
| MOUSEHOLE DEPTH | 10' (3.0m) |
| CELLAR SIZE | 8'X8' (2.4mX2.4m) |
| CELLAR DEPTH | ' (m) |

**MINIMUM LOCATION SIZE**
FROM HOLE CENTER

| | |
|---|---|
| TO CROWN END | 150'-0" (46m) |
| TO BACK OF RIG | 160'-0" (49m) |
| TO DOG HOUSE SIDE | 150'-0" (46m) |
| TO SUMP SIDE | 75'-0" (23m) |

DATE: JUN 16, 2009
DWG NO.: 851-075-I2
APPROVED BY ENGINEERING
DRAWN BY S. AKKERMANS

| 0'-0" | 16'-6" | 33'-0" | 49'-6" |
|---|---|---|---|
| (0m) | (5m) | (10m) | (15m) |

PRECISION DRILLING

**Murchison Oil & Gas, Inc.**
**Hydrogen Sulfide Drilling Operation Plan**
**War Horse Fed Com #3H**
**Sec. 21, T18S, R29E, Eddy County, NM**

I. **Hydrogen Sulfide Training:** All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

**a.** The hazards and characteristics of hydrogen sulfide (H2S)
**b.** The proper use and maintenance of personal protective equipment and life support systems.
**c.** The proper use of H2S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
**d.** The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

**e.** The effects of H2S on metal components. If high tensile tubular are to be used, personnel will be trained in their special maintenance requirements.
**f.** Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
**g.** The contents and requirements of H2S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500 feet) and weekly H2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H2S Drilling Operations Plan and Public Protection Plan. The concentrations of H2S of wells in this area from surface to TD are low enough that a contingency plan is not required.

II. **H2S Safety Equipment and Systems:** All H2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H2S.

See COA

**a. Well Control Equipment:**

**i.** Flare line.
**ii.** Choke manifold. w/remotely operated choke
**iii.** A 13-5/8" 5M BOP stack with an Annular, Upper Pipe Ram, Lower Pipe Ram and Blind/Shear Ram will be installed prior to drilling out the first cement plug.
**iv.** Auxiliary equipment including, if applicable, annular preventer and rotating head.
**v.** Mud/Gas Separator

**b. Protective Equipment for Essential Personnel:**

**i.** Rescue Packs (SCBA) – 1 unit shall be placed at each breathing area, 2 shall be stored in the safety trailer.

ii. Work / Escape Packs – 4 packs shall be stored on the rig floor with sufficient air hose not to restrict work activity.

iii. Emergency Escape Packs – 4 packs shall be stored in the doghouse for emergency evacuation.

**c. H2S Detection and Monitoring Equipment:**

i. The stationary detector with three (3) sensors will be placed in the upper dog house if equipped, set to visually alarm @ 10 ppm and audible alarm @ 15 ppm. Calibrate a minimum of every 30 days or as needed. The three sensors will be placed in the following places: (Gas sample tubes will be stored in the safety trailer):

1. Rig Floor
2. Bell Nipple
3. End of flow line or where well bore fluid is being discharged

**d. Visual Warning Systems:**

i. Wind direction indicator as shown on well site diagram.

ii. Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate.

iii. A Colored Condition flag will be on display reflecting the condition at the site at that time.

**e. Mud Program**:

i. The mud program has been designated to minimize the volume of H2S circulated to surface. Proper mud weight, safe drilling practices, and the use of H2S scavengers will minimize hazards when penetrating H2S bearing zones.

**f. Metallurgy:**

i. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.

ii. All elastomers used for packing and seals shall be H2S trim.

**g. Communication:**

i. Hand-held radio communication and cell phones.

ii. Land line (telephone) communication at Office.

**h. Secondary Egress:**

i. From northwest corner proceed over berm and through field to main access road. Secondary egress is a minimum of 300' from flare pit.

**III. Well Testing:** There will be no drill stem testing.

**IV. Emergency Call List:**

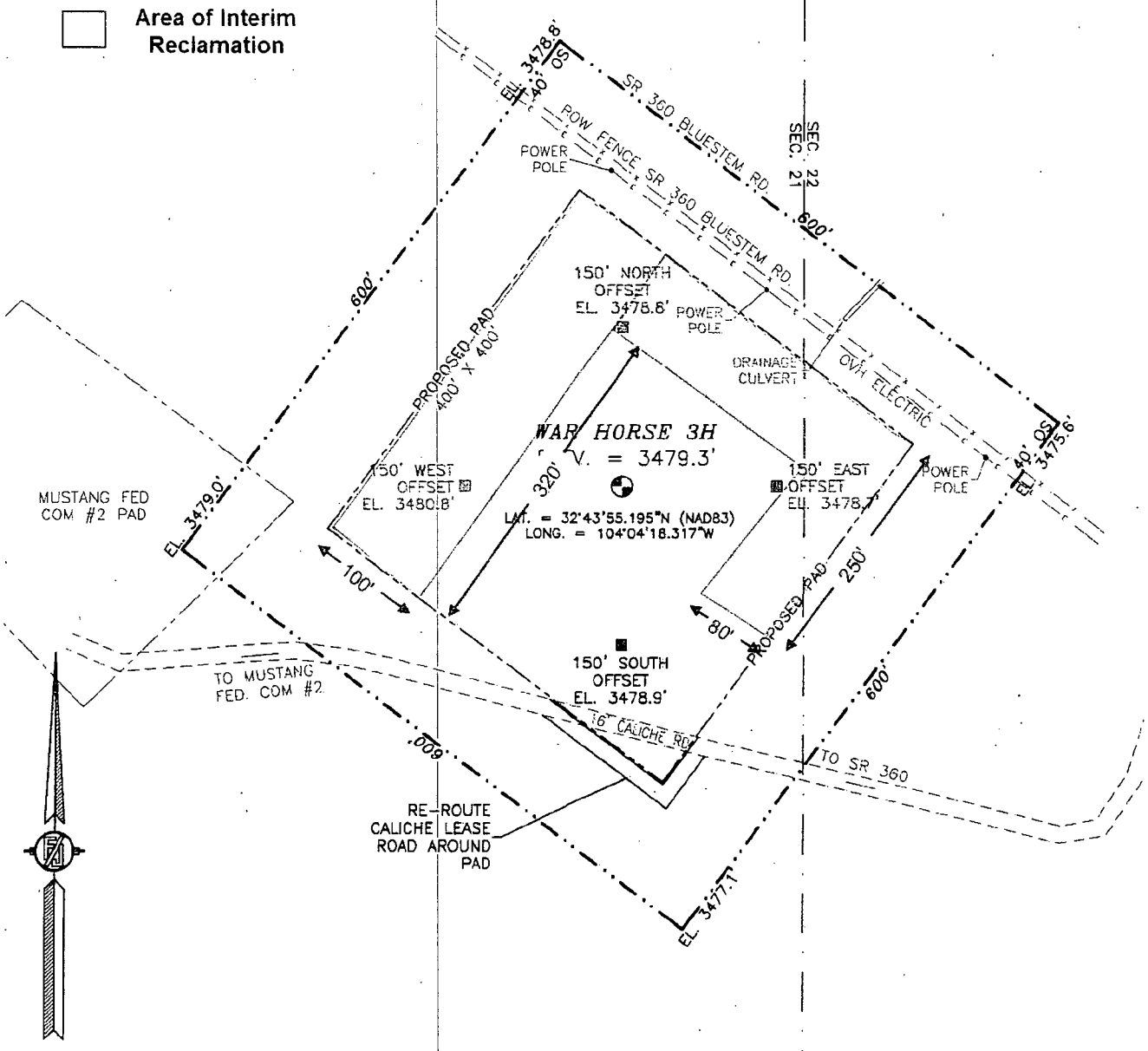
| | Office | Cell | Home |
|---|---|---|---|
| Jack Rankin | 972-931-0700 | 713-582-3859 | 281-894-7065 |
| Greg Boans | 575-628-3932 | 575-706-0667 | 575-887-9181 |

## V. Emergency Response Numbers, Eddy County:

| | |
|---|---|
| State Police | 888-442-6677 |
| Eddy County Sheriff - Carlsbad | 575-746-9888 |
| Eddy County Emergency Management - Carlsbad | 575-887-7551 |
| State Emergency Response Center (SERC) | 505-476-9635 |
| Artesia Police / Fire / Ambulance Department | 575-746-5000 |
| New Mexico Oil Conservation Division - Artesia | 575-748-1283 |
| Callaway Safety Equipment, Inc. | 575-392-2973 |

**EXHIBIT F-2**
**AREA OF INTERIM RECLAMATION**

*SECTION 21, TOWNSHIP 18 SOUTH, RANGE 29 EAST, N.M.P.M.*
*EDDY COUNTY, STATE OF NEW MEXICO*



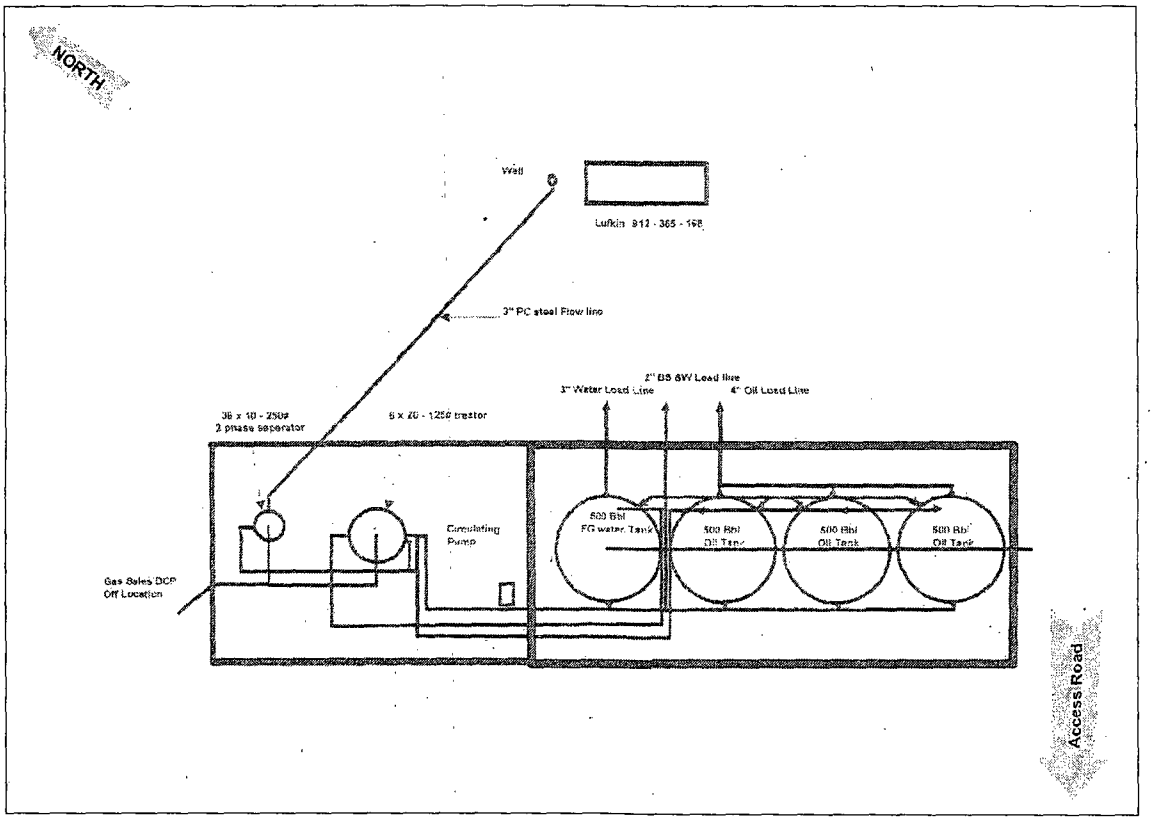

**DIRECTIONS TO LOCATION**
FROM THE INTERSECTION OF CR 217 (HAGERMAN CUTOFF) AND SR 360 (BLUESTEM) GO SOUTH ON SR 360 1.9 MILES TO CALICHE LEASE ROAD WITH CATTLE GUARD ON RIGHT GO WEST ON CALICHE ROAD ABOUT 200 FT. TO CALICHE ROAD ON RIGHT GO NORTH 0.1 MILES SITE IS ABOUT 170 FT ON RIGHT (NORTH)

*MURCHISON OIL & GAS, INC.*
***WAR HORSE 3H***
*LOCATED 2290 FT. FROM THE SOUTH LINE AND 175 FT. FROM THE EAST LINE OF SECTION 21, TOWNSHIP 18 SOUTH, RANGE 29 EAST, N.M.P.M.*
*EDDY COUNTY, STATE OF NEW MEXICO*

*SEPTEMBER 24, 2012*

*SURVEY NO. 1245A*
*MADRON SURVEYING, INC.* 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

# Exhibit F-1
## Production Facility Layout
## War Horse Fed Com #3H




Containment Area: Fiberglass container around tanks (Vol. = 40' x 100' x 2.89' = 2,064 bbls)
Tank Pad: Tanks set within fiberglass containment
Leak Detection: Leak detection float w/alarm inside fiberglass container; level control alarms on all tanks

# PECOS DISTRICT
# CONDITIONS OF APPROVAL

| | |
|---|---|
| **OPERATOR'S NAME:** | **Murchison Oil & Gas, Inc.** |
| **LEASE NO.:** | **NMNM-030752** |
| **WELL NAME & NO.:** | **War Horse Fed Com 3H** |
| **SURFACE HOLE FOOTAGE:** | **2290' FSL & 0175' FEL** |
| **BOTTOM HOLE FOOTAGE** | **2290' FSL & 0330' FWL** |
| **LOCATION:** | **Section 21, T. 18 S., R 29 E., NMPM** |
| **COUNTY:** | **Eddy County, New Mexico** |

## TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

## I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

## II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

## III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

## IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

## V. SPECIAL REQUIREMENT(S)

**Communitization Agreement**
A Communitization Agreement covering the acreage dedicated to this well must be filed for approval with the BLM. The effective date of the agreement shall be prior to any sales.

**Communitization Agreement Wells**
The well sign for a communitization agreement (CA) wells shall include the CA number in addition to the surface and bottom hole lease numbers.

## VI. CONSTRUCTION

### A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

### B. TOPSOIL

The operator shall stockpile the topsoil in a low profile manner in order to prevent wind/water erosion of the topsoil. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be used for interim and final reclamation.

### C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

### D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

### E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation.

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

## F. ON LEASE ACCESS ROADS

**Road Width**
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

**Surfacing**
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

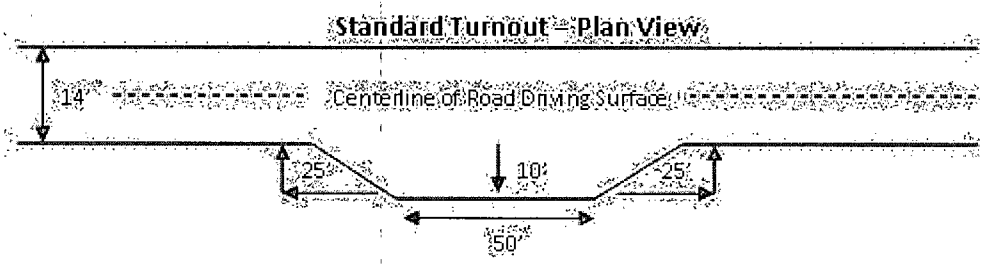
Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

**Crowning**
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

**Ditching**
Ditching shall be required on both sides of the road.

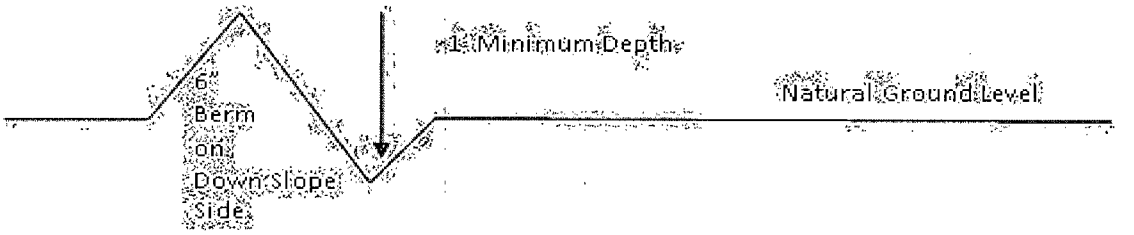
**Turnouts**
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall be constructed on all blind curves. Turnouts shall conform to the following diagram:




**Drainage**
Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

**Cross Section of a Typical Lead-off Ditch**




All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

**Formula for Spacing Interval of Lead-off Ditches**

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

400 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ lead-off ditch interval

**Culvert Installations**
Appropriately sized culvert(s) shall be installed at the deep waterway channel flow crossing.

**Cattleguards**
An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s).

Any existing cattleguard(s) on the access road shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattleguard(s) that are in place and are utilized during lease operations.

A gate shall be constructed and fastened securely to H-braces.

**Fence Requirement**

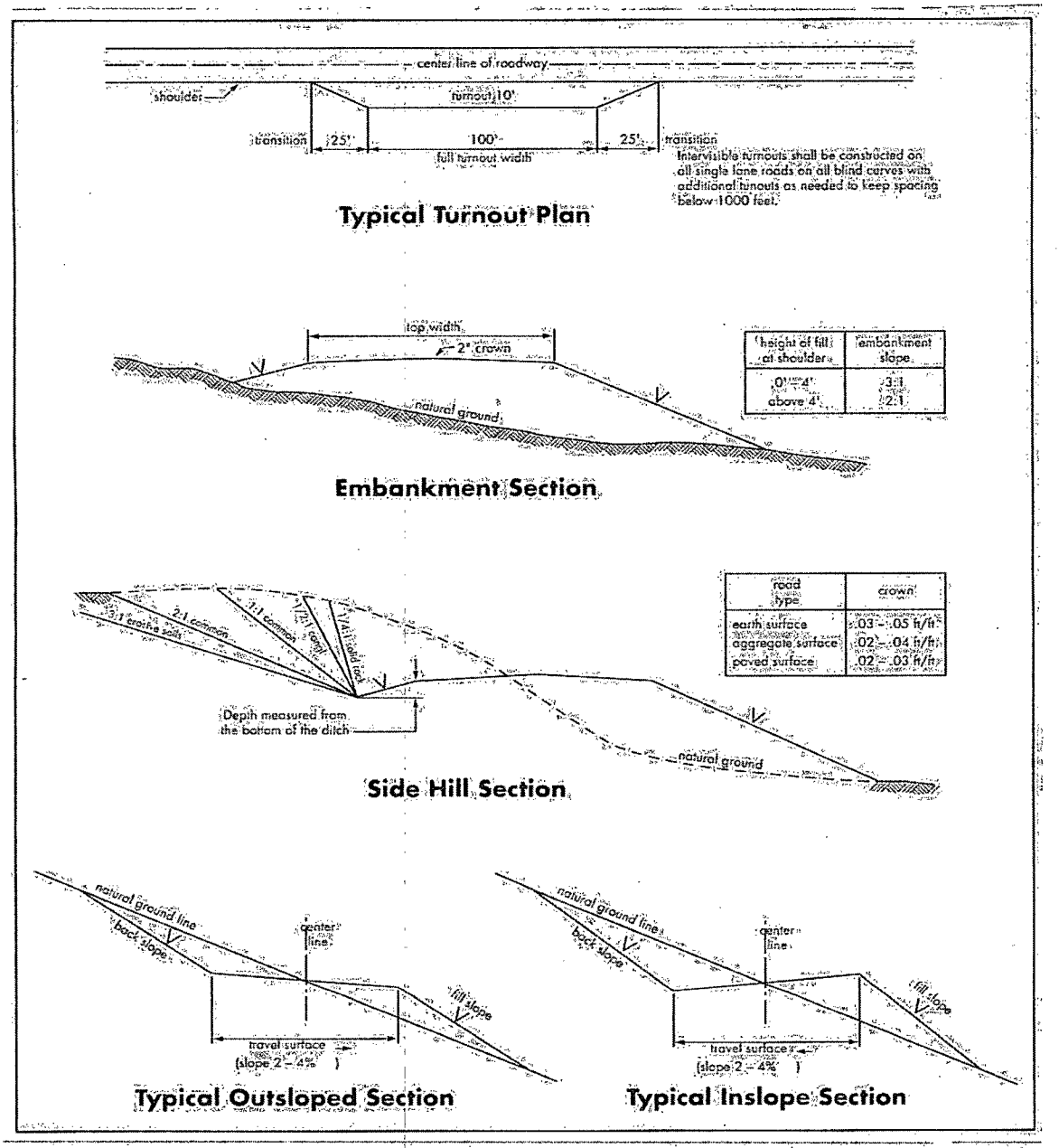
Where entry is required across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting.

The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

**Public Access**

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

**Figure 1 – Cross Sections and Plans For Typical Road Sections**



# VII. DRILLING

## A. DRILLING OPERATIONS REQUIREMENTS

The BLM is to be notified a minimum of 4 hours in advance for a representative to witness:

a. Spudding well
b. Setting and/or Cementing of all casing strings
c. BOPE tests

☒ **Eddy County**
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

1. **A Hydrogen Sulfide (H2S) Drilling Plan shall be activated prior to drilling out the surface shoe. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.**

2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.

4. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

## B. CASING

**Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.).**

**Centralizers required on surface casing per Onshore Order 2.III.B.1.f.**

**Wait on cement (WOC) time prior to drilling out for a primary cement job will be a minimum 18 hours for a water basin, 24 hours in the potash area, or 500 pounds compressive strength, whichever is greater for all casing strings. DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. See individual casing strings for details regarding lead cement slurry requirements.**

**No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.**

**Possibility of water and brine flows in the Salado and Artesia Groups.**
**Possibility of lost circulation in the Grayburg and San Andres formations.**

1. The **13-3/8** inch surface casing shall be set at approximately **280** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface. **If salt is encountered, set casing at least 25 feet above the salt.**

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

    **b. Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

**Formation below the 13-3/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight anticipated to control the formation pressure to the next casing depth. Report results to BLM office.**

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

   ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

**Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight anticipated to control the formation pressure to the next casing depth. Report results to BLM office.**

**Centralizers required through the curve and a minimum of one every other joint.**

3. The minimum required fill of cement behind the **7** inch production casing is:

   ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above.

**Formation below the 7" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight anticipated to control the formation pressure to the next casing depth. Report results to BLM office.**

4. Cement not required on the **4-1/2"** casing. **Packer system being used.**

5. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

## C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi. **5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**

3. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

    b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.

    c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock.

    d. The results of the test shall be reported to the appropriate BLM office.

    e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**

    f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

## D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

## E. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

**JAM 031813**

# VIII. PRODUCTION (POST DRILLING)

## A. WELL STRUCTURES & FACILITIES

**Placement of Production Facilities**
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

**Containment Structures**
The containment structure shall be constructed to hold the capacity of the entire contents of the largest tank, plus 24 hour production, unless more stringent protective requirements are deemed necessary by the Authorized Officer.

**Painting Requirement**
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, Shale Green from the BLM Standard Environmental Color Chart (CC-001: June 2008).

# IX. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

# X. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Seed Mixture 2, for Sandy Sites

The holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed will be done in accordance with State law (s) and within nine (9) months prior to purchase. Commercial seed will be either certified or registered seed. The seed container will be tagged in accordance with State law(s) and available for inspection by the authorized officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). The holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. The seeding will be repeated until a satisfactory stand is established as determined by the authorized officer. Evaluation of growth will not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

| Species | lb/acre |
|---|---|
| Sand dropseed (Sporobolus cryptandrus) | 1.0 |
| Sand love grass (Eragrostis trichodes) | 1.0 |
| Plains bristlegrass (Setaria macrostachya) | 2.0 |

*Pounds of pure live seed: Pounds of seed **x** percent purity **x** percent germination = pounds pure live seed