

Form 3160-3
(June 2015)FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: ☒ DRILL ☐ REENTER 1b. Type of Well: ☒ Oil Well ☒ Gas Well ☐ Other 1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone		5. Lease Serial No. NMNM110829 6. If Indian, Allottee or Tribe Name 7. If Unit or CA Agreement, Name and No. 8. Lease Name and Well No. TOMAHAWK FEDERAL UNIT 713H 9. API Well No. 30 015 47320
2. Name of Operator COG OPERATING LLC 3a. Address 600 West Illinois Ave, Midland, TX 79701 3b. Phone No. (include area code) (432) 683-7443		10. Field and Pool, or Exploratory Malaga/PURPLE SAGE WOLFCAMP GA: 11. Sec., T. R. M. or Blk. and Survey or Area SEC 29/T24S/R28E/NMP
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface NENW / 500 FNL / 1744 FWL / LAT 32.194574 / LONG -104.112574 At proposed prod. zone NWNW / 200 FNL / 813 FWL / LAT 32.224538 / LONG -104.115657		12. County or Parish EDDY 13. State NM
14. Distance in miles and direction from nearest town or post office* 3 miles 15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 330 feet 16. No of acres in lease 560 17. Spacing Unit dedicated to this well 4803.0		18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 961 feet 19. Proposed Depth 9374 feet / 20170 feet 20. BLM/BIA Bond No. in file FED: NMB000215
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3042 feet 22. Approximate date work will start* 08/01/2020		23. Estimated duration 30 days 24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

- | | |
|---|---|
| 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 requested by the BLM. |
|---|---|

25. Signature (Electronic Submission) Title Regulatory Advisor	Name (Printed/Typed) STAN WAGNER / Ph: (432) 683-7443	Date 03/23/2020
Approved by (Signature) (Electronic Submission) Title Assistant Field Manager Lands & Minerals	Name (Printed/Typed) Cody Layton / Ph: (575) 234-5959 Office Carlsbad Field Office	Date 08/07/2020

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.

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.

APPROVED WITH CONDITIONS

Approval Date: 08/07/2020

(Continued on page 2)

*(Instructions on page 2)

Entered - KMS NMOC

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. FIRST ST., ARTESIA, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-015- 47320	Pool Code 98220	Pool Name Purple Sage; Wolfcamp (Gas)
Property Code 328919	Property Name TOMAHAWK FEDERAL UNIT	Well Number 713H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3042.5'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	29	24-S	28-E		500	NORTH	1744	WEST	EDDY

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
D	17	24-S	28-E		200	NORTH	813	WEST	EDDY

Dedicated Acres 1280 HSU 4803.16 Ul. Ac	Joint or Infill	Consolidation Code	Order No.
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NO ALLOWABLE WILL BE ASSIGNED TO THIS COMPLETION UNTIL ALL INTERESTS HAVE BEEN CONSOLIDATED
OR A NON-STANDARD UNIT HAS BEEN APPROVED BY THE DIVISION

LEASE X-ING
LAT.=32.217812° N
LONG.=104.115639° W

LEASE X-ING
LAT.=32.210537° N
LONG.=104.115621° W

POINT LEGEND

1	Y=445676.9 N X=607836.4 E
2	Y=443034.4 N X=607841.8 E
3	Y=440391.8 N X=607847.2 E
4	Y=437745.7 N X=607862.4 E
5	Y=435099.2 N X=607880.7 E
6	Y=440403.6 N X=610484.8 E

HSU

813' B.H. 200'

330' FNL & 813' FWL
Y=445359.1 N
X=608650.3 E
LAT.=32.224181° N
LONG.=104.115656° W

LTP

GRID AZ. - 359°45'28"
HORZ. DIST. - 10384.4'

SECTION 17
SECTION 20

Unit Boundary

10' FSL & 813' FWL
Y=435104.8 N
X=608693.7 E
LAT.=32.195993° N
LONG.=104.115583° W
GRID AZ. TO FTP
298°54'15"

SECTION 20
SECTION 29

1744' S.L.

500'

NAD 83 NME
PROPOSED BOTTOM
HOLE LOCATION
Y=445489.1 N
X=608649.7 E
LAT.=32.224538° N
LONG.=104.115657° W

NAD 83 NME
SURFACE LOCATION
Y=434590.4 N
X=609625.4 E
LAT.=32.194574° N
LONG.=104.112574° W

OPERATOR CERTIFICATION

I hereby certify that the information 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Stan Wagner 3-23-2020
Signature Date
Stan Wagner
Printed Name
E-mail Address

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.

JANUARY 30, 2020
Date of Survey

Signature & Seal of Professional Surveyor

Chad L. Harcrow 2/17/20
Certificate No. CHAD HARCROW 17777
W.O. # 20-368A DRAWN BY: AH

PECOS DISTRICT DRILLING OPERATIONS CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG Operating LLC
LEASE NO.:	NMNM110829
WELL NAME & NO.:	Tomahawk Federal Unit 713H
SURFACE HOLE FOOTAGE:	500' FNL & 1744' FWL
BOTTOM HOLE FOOTAGE:	200' FNL & 813' FWL
LOCATION:	Section 29, T 24S, R 28E, NMPM
COUNTY:	Eddy County, New Mexico

H2S	☐ Yes	☒ No	
Potash	☒ None	☐ Secretary	☐ R-111-P
Cave/Karst Potential	☐ Low	☒ Medium	☐ High
Variance	☐ None	☒ Flex Hose	☐ Other
Wellhead	☒ Conventional	☐ Multibowl	☐ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☐ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☐ COM	☒ Unit

A. HYDROGEN SULFIDE

1. Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall 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.

B. CASING

1. The **10-3/4"** surface casing shall be set a minimum of 25' above the top of the salt and cemented to surface.
 - a. **If cement does not circulate to 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 **6 hours** after pumping cement, ideally between 8-10 hours after.
 - b. WOC time for a primary cement job will be a minimum of **8 hours** or **500 psi** compressive strength, whichever is greater. This is to include the lead cement.
 - c. If cement falls back, remedial cementing will be done prior to drilling out the shoe.
 - d. WOC time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 psi compressive strength, whichever is greater.

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1625 N. French Dr., Hobbs, NM 88240
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District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

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

Submit Original
to Appropriate
District Office

GAS CAPTURE PLAN

Date: 3/20/2020

☒ Original Operator & OGRID No.: COG Operating LLC, (229137)

☐ Amended - Reason for Amendment: _____

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomple to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comments
Tomahawk Federal Unit 711H	30-015-	C-29-24S-28E	500' FNL & 1804' FWL	±3500	None Planned	APD Submission Plan Subject to change
Tomahawk Federal Unit 712H	30-015-	C-29-24S-28E	500' FNL & 1774' FWL	±3500	None Planned	APD Submission Plan Subject to change
Tomahawk Federal Unit 713H	30-015-	C-29-24S-28E	500' FSL & 1744' FEL	±3500	None Planned	APD Submission Plan Subject to change

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to **Crestwood Midstream** and will be connected to **Willow Lake** low pressure gathering system located in **Reeves** County, Texas. **COG Operating LLC** provides (periodically) to **Crestwood Midstream** a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, **COG Operating LLC** and **Crestwood Midstream** have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at **Crestwood Midstream** Processing Plant located in Sec. **19**, Blk. **56**, Twn **2**, **Reeves** County, Texas. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on Gas Transporter system at that time. Based on current information, it is Operator's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
 - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
 - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines

- NGL Removal – On lease
 - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines

Intent ☒ As Drilled ☐

API # 30-015-			
Operator Name: COG Operating LLC		Property Name: Tomahawk Federal Unit	Well Number 713H

Kick Off Point (KOP)

UL C	Section 29	Township 24S	Range 28E	Lot	Feet	From N/S	Feet	From E/W	County Eddy
Latitude					Longitude				NAD 83

First Take Point (FTP)

UL M	Section 20	Township 24S	Range 28E	Lot	Feet 10	From N/S South	Feet 813	From E/W West	County Eddy
Latitude 32.195993					Longitude -104.115583				NAD NAD 83

Last Take Point (LTP)

UL D	Section 17	Township 24S	Range 28E	Lot	Feet 330	From N/S North	Feet 813	From E/W West	County Eddy
Latitude 32.224181					Longitude -104.115656				NAD NAD 83

Is this well the defining well for the Horizontal Spacing Unit? ☐ No

Is this well an infill well? ☐ Yes

If infill is yes please provide API if available, Operator Name and well number for Defining well for Horizontal Spacing Unit.

API # 30-015-			
Operator Name: COG Operating LLC		Property Name: Tomahawk Federal Unit	Well Number 711H

KZ 06/29/2018

2. The 7-5/8" intermediate casing shall be set be cemented to surface.
 - a. **If cement does not circulate to surface**, see B.1.a, c & d.
3. The 5-1/2" production casing shall be cemented with at least **200' tie-back** into the previous casing. Operator shall provide method of verification.
 - a. In Medium Cave/Karst Areas, if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

C. PRESSURE CONTROL

1. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **5000 (5M)** psi.

D. SPECIAL REQUIREMENTS

2. The well sign for a unit well shall include the unit number (when applied for) in addition to the surface and bottom hole lease numbers. This also applies to participating area numbers. If a participating area has not been established, the operator can use the general unit designation, but will replace the unit number with the participating area number once it has been established.
 - a. A commercial well determination shall be submit after production has been established for at least six months. Secondary recovery unit wells are exempt from this requirement.

DR 8/5/2020

GENERAL REQUIREMENTS

1. The BLM is to be notified in advance for a representative to witness:
 - a. Spudding the well (minimum of 24 hours)
 - b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
 - c. BOP/BOPE tests (minimum of 4 hours)
 - ☒ Eddy County: Call the Carlsbad Field Office, (575) 361-2822
 - ☒ Lea County: Call the Hobbs Field Station, (575) 393-3612
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.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig:
 - i. Notify the BLM when moving in and removing the Spudder Rig.
 - ii. Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - iii. BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
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 are 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 available upon request. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. 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.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the

following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well-specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On the portion of well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. 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.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. 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. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. If the operator has proposed a multi-bowl wellhead assembly in the APD, it must meet or exceed the pressure rating of the BOP system. Additionally, the following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
 - e. Whenever any seal subject to test pressure is broken, all the tests in Onshore Order 2 III.A.2.i must be followed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the BOP/BOPE 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. In potash areas, 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. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test which can be initiated immediately after bumping the plug (only applies to single-stage cement jobs).
 - c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be made available upon request.
 - d. 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. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
 - e. 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. This test shall be performed prior

to the test at full stack pressure.

- f. BOP/BOPE must be tested within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

1. Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

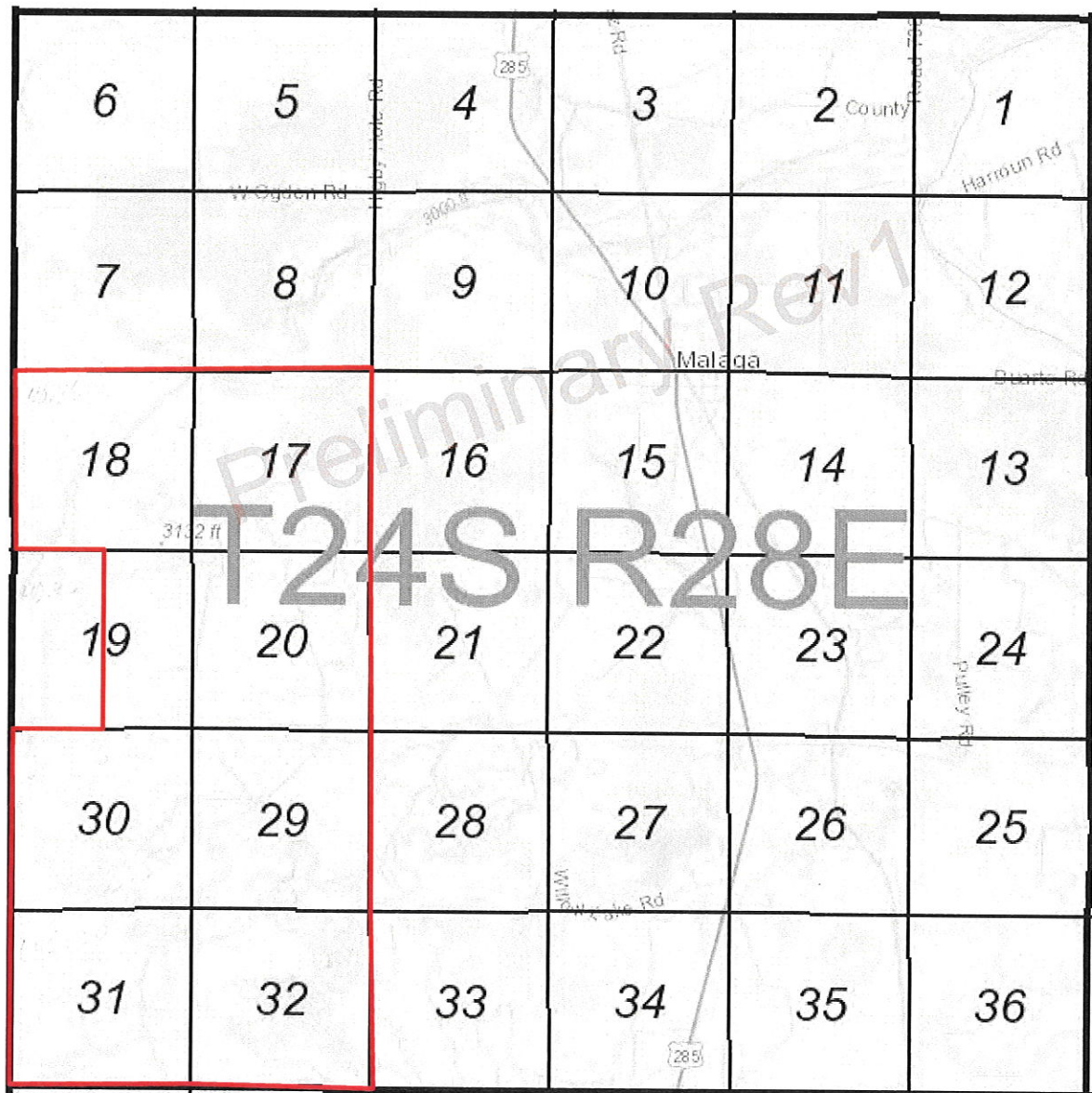
D. WASTE MATERIAL AND FLUIDS

1. 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.
2. Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

TOMAHAWK FEDERAL EXPLORATORY UNIT
PARTICIPATING AREA
WOLFCAMP FORMATION

Township 24 South, Range 28 East

Section 17: All	Section 18: All
Section 19: E/2	Section 20: All
Section 29: All	Section 30: All
Section 31: All	Section 32: All



COG Operating, LLC - Tomahawk Federal Unit #713H

1. Geologic Formations

TVD of target	9,356' EOL	Pilot hole depth	NA
MD at TD:	20,170'	Deepest expected fresh water:	50'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	400	Water	
Top of Salt	926	Salt	
Base of Salt	2238	Salt	
Lamar	2445	Salt Water	
Bell Canyon	2481	Salt Water	
Cherry Canyon	3263	Oil/Gas	
Brushy Canyon	4460	Oil/Gas	
Bone Spring Lime	5977	Oil/Gas	
U. Avalon Shale	6170	Oil/Gas	
L. Avalon Shale	6552	Oil/Gas	
1st Bone Spring Sand	6935	Oil/Gas	
2nd Bone Spring Sand	7679	Oil/Gas	
3rd Bone Spring Sand	8855	Oil/Gas	
Wolfcamp	9249	Target Oil/Gas	

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
14.75	0	815	10.75	45.5	J55	STC	5.73	11.30	13.29
9.875	0	8705	7.625	29.7	HCL80	BTC	2.04	1.51	2.79
6.75	0	20,170	5.5"	23	P110	SF Torq	2.49	2.96	3.05
BLM Minimum Safety Factor							1.125	1	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing to mitigate collapse. Intermediate burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface.

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

COG Operating, LLC - Tomahawk Federal Unit #713H

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

COG Operating, LLC - Tomahawk Federal Unit #713H

3. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft ³ / sack	H ₂ O gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	300	13.5	1.75	9	12	Lead: Class C + 4% Gel
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl ₂
Inter.	1400	11	2.8	19	48	Lead: NeoCem
	300	16.4	1.1	5	8	Tail: Class H
5.5 Prod	750	12.7	2	10.6	16	Lead: 35:65:6 H Blend
	1200	14.4	1.24	5.7	19	Tail: 50:50:2 Class H Blend

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results

Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0'	50%
1 st Intermediate	0'	50%
Production	8,205'	35%

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.
---	---

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	x	Tested to:
12-1/4"	13-5/8"	3M	Annular	x	2500 psi
			Blind Ram		3M
			Pipe Ram	x	
			Double Ram	x	
			Other*		
8 1/2"	13-5/8"	5M	5M Annular	x	2500 psi
			Blind Ram		5M
			Pipe Ram	x	
			Double Ram	x	
			Other*		

BOP and BOPE will be installed per Onshore Order #2 requirements prior to drilling below the surface casing and will be rated to the above pressure rating or greater, see attached diagrams. Required safety valves, with appropriate wrenches and subs for the drill string being utilized, will be in the open position and accessible on the rig floor.

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

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

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
N	Are anchors required by manufacturer?
Y	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

COG Operating, LLC - Tomahawk Federal Unit #713H

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	Surf. Shoe	FW Gel	8.4 - 8.6	28-29	N/C
Surf csg	Int shoe	Diesel Brine Emul	8.6 - 9.4	30-40	N/C
Int shoe	Lateral TD	OBM	10.5 - 12	30-40	20

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

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

6. Logging and Testing Procedures

Logging, Coring and Testing.	
Y	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
N	Are Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain.
N	Coring? If yes, explain.

Additional logs planned		Interval
N	Resistivity	Pilot Hole TD to ICP
N	Density	Pilot Hole TD to ICP
Y	CBL	Production casing (If cement not circulated to surface)
Y	Mud log	Intermediate shoe to TD
N	PEX	

COG Operating, LLC - Tomahawk Federal Unit #713H

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	5840 psi at 9356' TVD
Abnormal Temperature	NO 150 Deg. F.

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

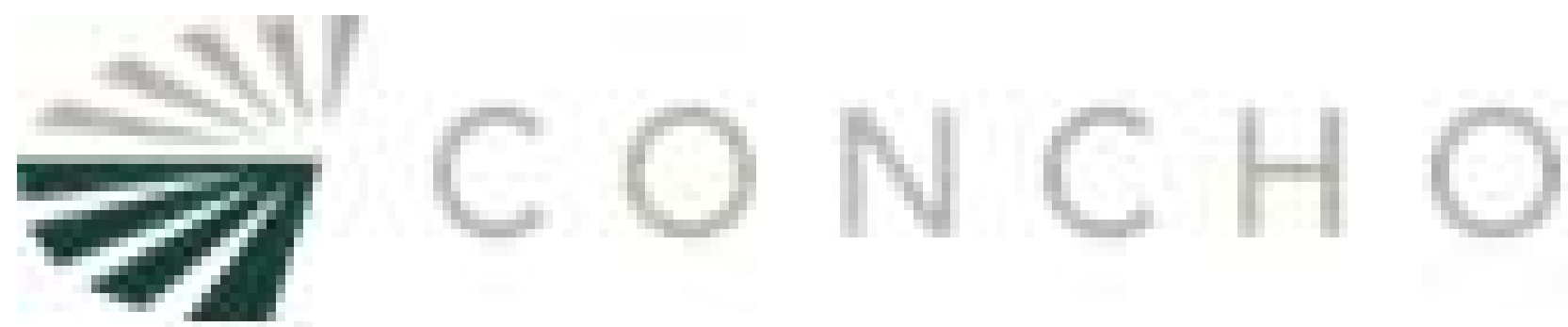
Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

Hydrogen Sulfide (H ₂ S) monitors will be installed prior to drilling out the surface shoe. If H ₂ S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H ₂ S is present
Y	H ₂ S Plan attached

8. Other Facets of Operation

Y	Is it a walking operation?
Y	Is casing pre-set?

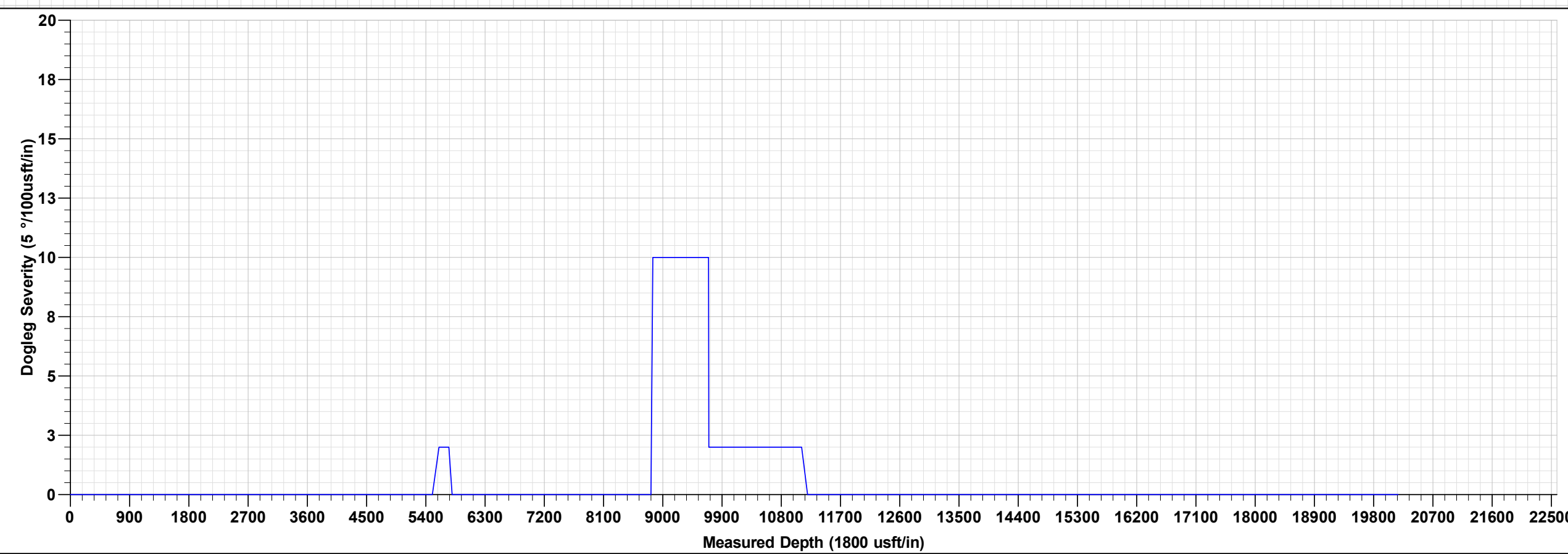
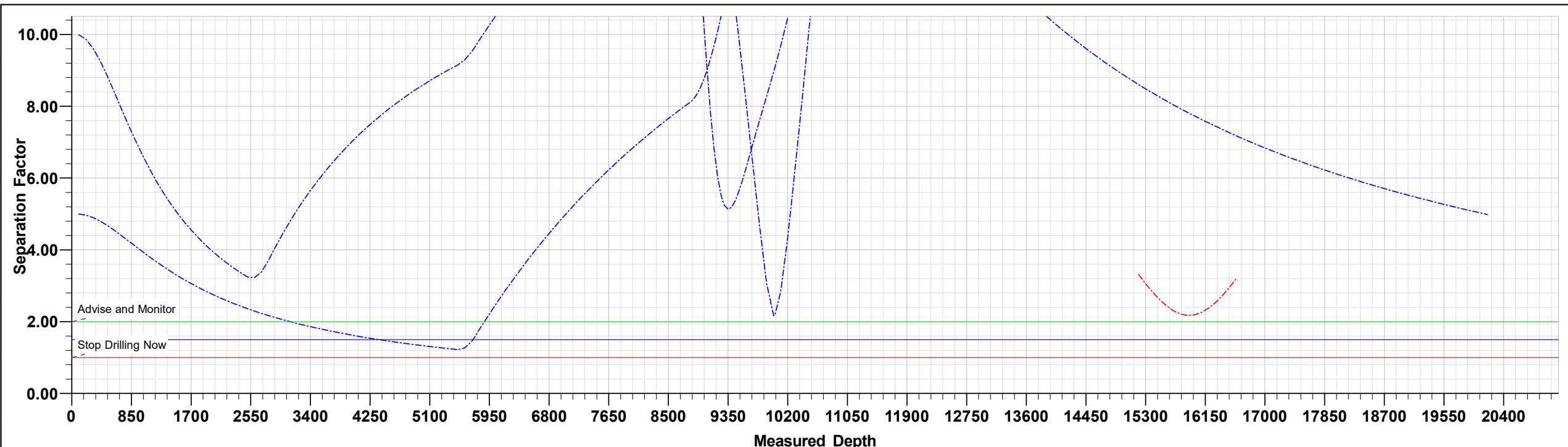
x	H ₂ S Plan.
x	BOP & Choke Schematics.
x	Directional Plan
x	5M Annular Variance



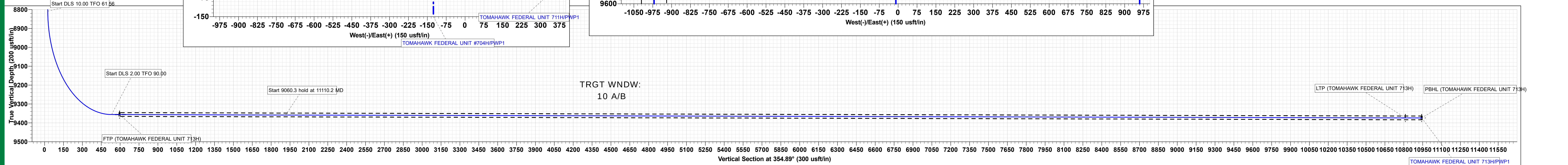
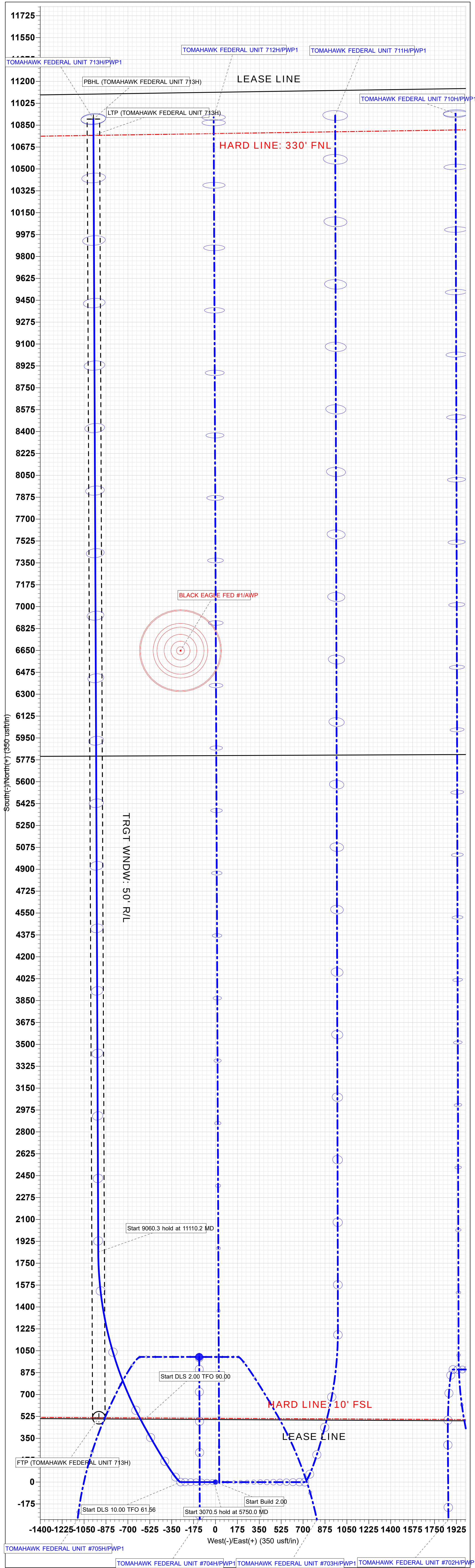
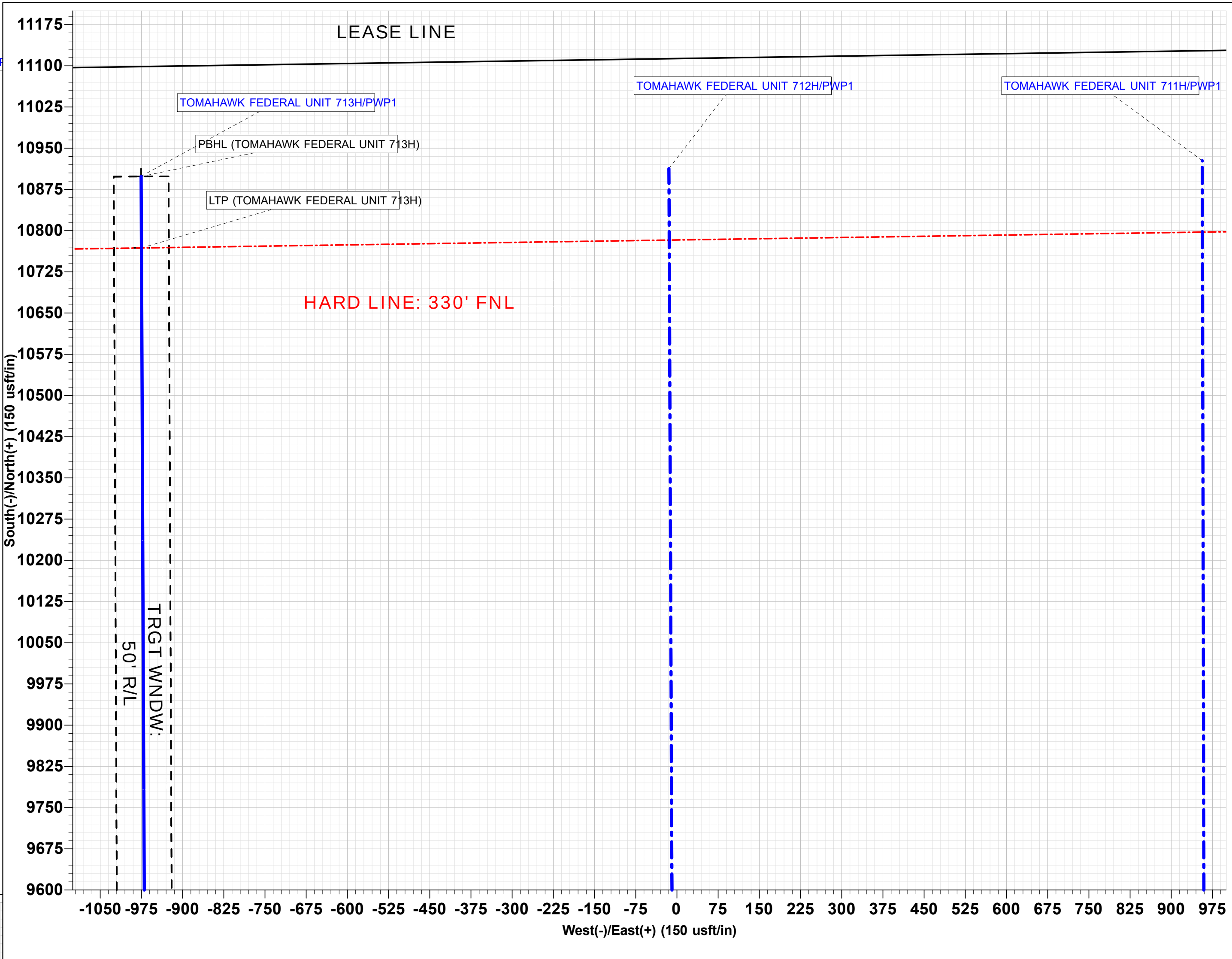
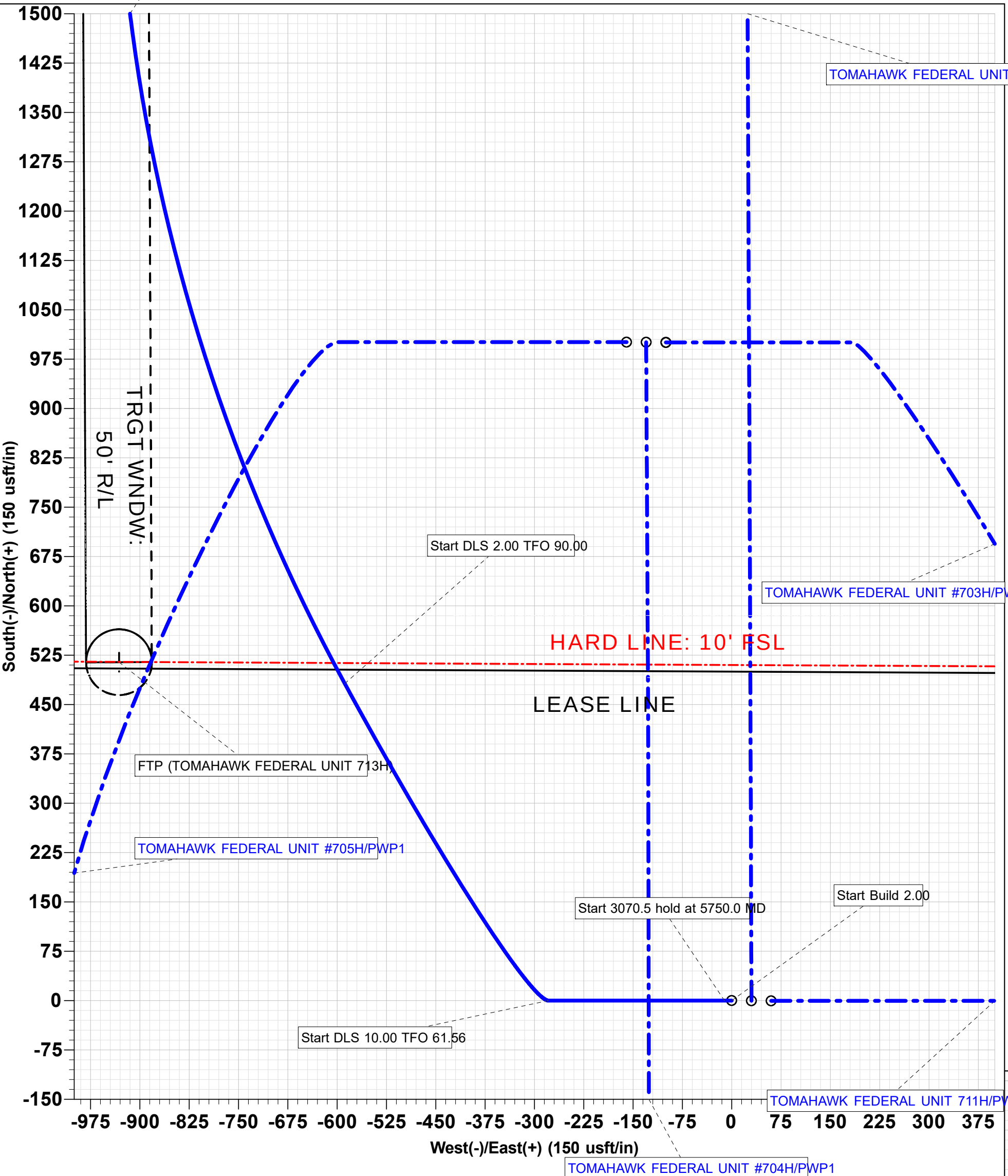
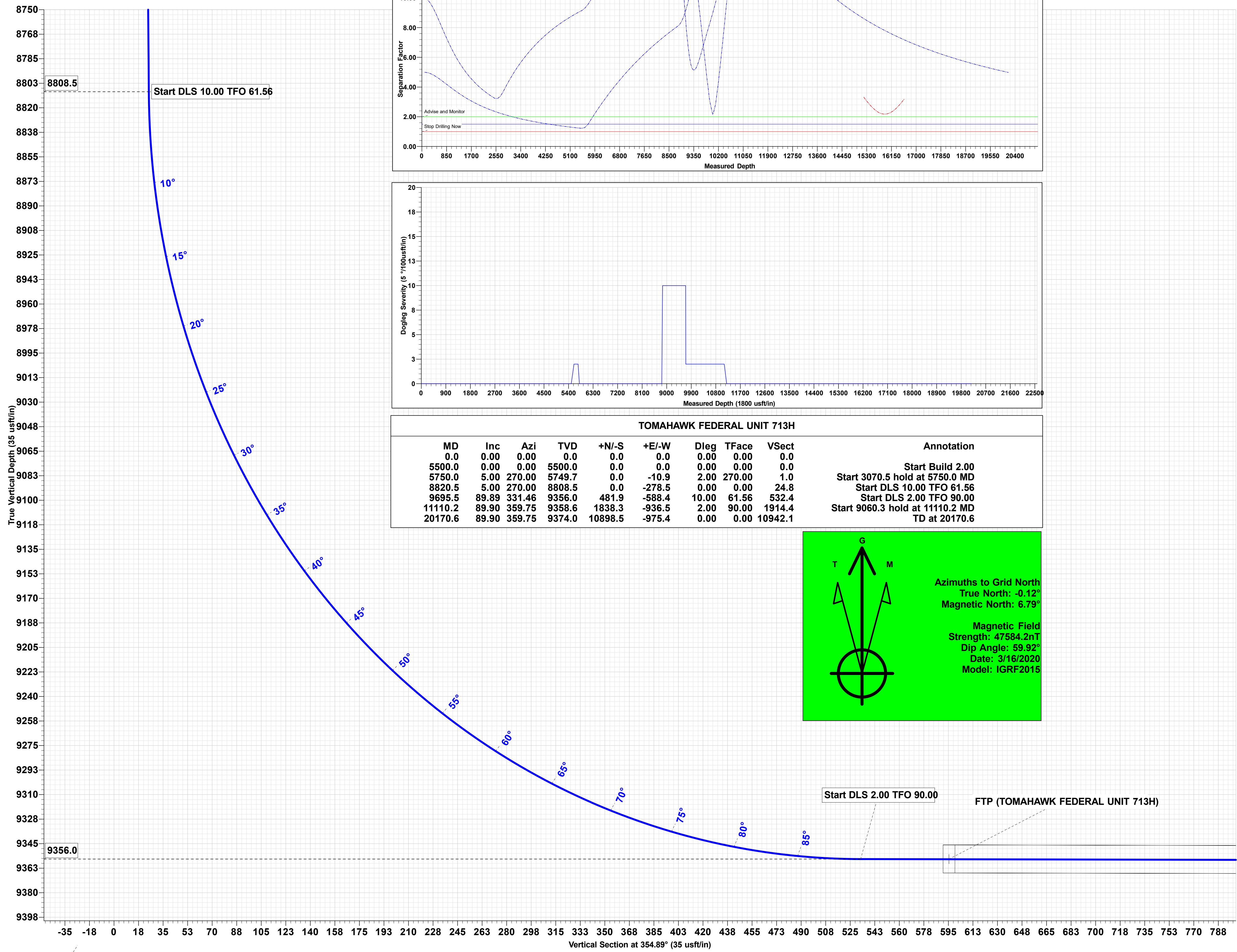
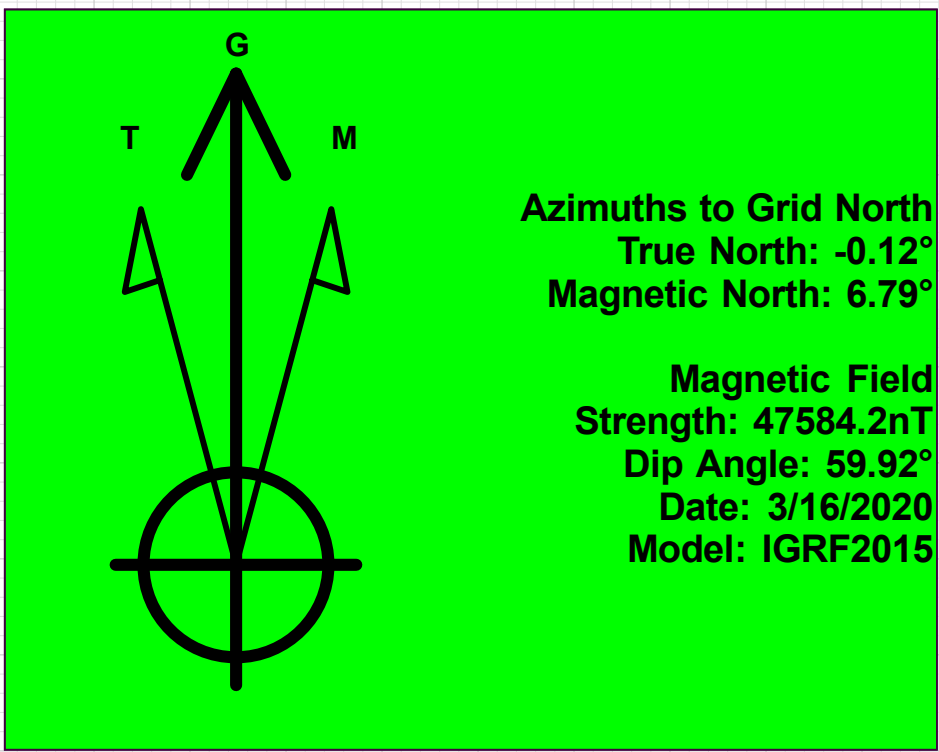
Project: EDDY COUNTY, NM
Site: ATLAS
Well: TOMAHAWK FEDERAL UNIT 713H
Wellbore: OWB
Design: PWP1
GL: 3042.5
KB=27" @ 3069.5usft (SCAN FREE)

WELL DETAILS: TOMAHAWK FEDERAL UNIT 713H						
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	
0.0	0.0	434532.10	568442.00	32° 11' 40.028 N	104° 6' 43.491 W	

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
FTP (TOMAHAWK FEDERAL UNIT 713H)	9356.0	514.4	-931.7	435046.50	567510.30	32° 11' 45.138 N	104° 6' 54.322 W
LTP (TOMAHAWK FEDERAL UNIT 713H)	9374.0	10768.5	-974.9	445300.60	567467.10	32° 13' 26.617 N	104° 6' 54.533 W
PBHL (TOMAHAWK FEDERAL UNIT 713H)	9374.0	10898.5	-975.4	445430.60	567466.60	32° 13' 27.903 N	104° 6' 54.585 W



TOMAHAWK FEDERAL UNIT 713H										
MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Annotation	
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	Start Build 2.00	
5500.0	0.00	0.00	5500.0	0.0	0.0	0.00	0.00	0.0	Start 3070.5 hold at 5750.0 MD	
5750.0	5.00	270.00	5749.7	0.0	-10.9	2.00	270.00	1.0	Start DLS 10.00 TFO 61.56	
8820.5	5.00	270.00	8808.5	0.0	-278.5	0.00	0.00	24.8	Start DLS 2.00 TFO 90.00	
9695.5	89.89	331.46	9356.0	481.9	-588.4	10.00	61.56	532.4	Start 9060.3 hold at 11110.2 MD	
11110.2	89.90	359.75	9356.0	1838.3	-936.5	2.00	90.00	1914.4	TD at 20170.6	
20170.6	89.90	359.75	9374.0	10898.5	-975.4	0.00	0.00	10942.1		



NORTHERN DELAWARE BASIN

EDDY COUNTY, NM

ATLAS

TOMAHAWK FEDERAL UNIT 713H

OWB

Plan: PWP1

Standard Survey Report

16 March, 2020

Concho Resources LLC

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Well:	TOMAHAWK FEDERAL UNIT 713H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	PWP1	Database:	edm

Project	EDDY COUNTY, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Well	TOMAHAWK FEDERAL UNIT 713H			
Well Position	+N/-S	0.0 usft	Northing:	434,532.10 usft
	+E/-W	0.0 usft	Easting:	568,442.00 usft
Position Uncertainty		3.0 usft	Wellhead Elevation:	usft
			Latitude:	32° 11' 40.028 N
			Longitude:	104° 6' 43.491 W
			Ground Level:	3,042.5 usft

Wellbore	OWB				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/16/2020	6.91	59.92	47,584.24471716

Design	PWP1				
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	354.89	

Survey Tool Program	Date	3/16/2020			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	20,170.3	PWP1 (OWB)	MWD+IFR1+FDIR	OWSG MWD + IFR1 + FDIR Correction	

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00	
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00	

Concho Resources LLC

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Well:	TOMAHAWK FEDERAL UNIT 713H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	PWP1	Database:	edm

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 2.00									
5,600.0	2.00	270.00	5,600.0	0.0	-1.7	0.2	2.00	2.00	0.00
5,700.0	4.00	270.00	5,699.8	0.0	-7.0	0.6	2.00	2.00	0.00

Concho Resources LLC

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Well:	TOMAHAWK FEDERAL UNIT 713H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	PWP1	Database:	edm

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,750.0	5.00	270.00	5,749.7	0.0	-10.9	1.0	2.00	2.00	0.00
Start 3070.5 hold at 5750.0 MD									
5,800.0	5.00	270.00	5,799.5	0.0	-15.3	1.4	0.00	0.00	0.00
5,900.0	5.00	270.00	5,899.1	0.0	-24.0	2.1	0.00	0.00	0.00
6,000.0	5.00	270.00	5,998.7	0.0	-32.7	2.9	0.00	0.00	0.00
6,100.0	5.00	270.00	6,098.4	0.0	-41.4	3.7	0.00	0.00	0.00
6,200.0	5.00	270.00	6,198.0	0.0	-50.1	4.5	0.00	0.00	0.00
6,300.0	5.00	270.00	6,297.6	0.0	-58.8	5.2	0.00	0.00	0.00
6,400.0	5.00	270.00	6,397.2	0.0	-67.6	6.0	0.00	0.00	0.00
6,500.0	5.00	270.00	6,496.8	0.0	-76.3	6.8	0.00	0.00	0.00
6,600.0	5.00	270.00	6,596.4	0.0	-85.0	7.6	0.00	0.00	0.00
6,700.0	5.00	270.00	6,696.1	0.0	-93.7	8.4	0.00	0.00	0.00
6,800.0	5.00	270.00	6,795.7	0.0	-102.4	9.1	0.00	0.00	0.00
6,900.0	5.00	270.00	6,895.3	0.0	-111.1	9.9	0.00	0.00	0.00
7,000.0	5.00	270.00	6,994.9	0.0	-119.8	10.7	0.00	0.00	0.00
7,100.0	5.00	270.00	7,094.5	0.0	-128.6	11.5	0.00	0.00	0.00
7,200.0	5.00	270.00	7,194.2	0.0	-137.3	12.2	0.00	0.00	0.00
7,300.0	5.00	270.00	7,293.8	0.0	-146.0	13.0	0.00	0.00	0.00
7,400.0	5.00	270.00	7,393.4	0.0	-154.7	13.8	0.00	0.00	0.00
7,500.0	5.00	270.00	7,493.0	0.0	-163.4	14.6	0.00	0.00	0.00
7,600.0	5.00	270.00	7,592.6	0.0	-172.1	15.3	0.00	0.00	0.00
7,700.0	5.00	270.00	7,692.3	0.0	-180.9	16.1	0.00	0.00	0.00
7,800.0	5.00	270.00	7,791.9	0.0	-189.6	16.9	0.00	0.00	0.00
7,900.0	5.00	270.00	7,891.5	0.0	-198.3	17.7	0.00	0.00	0.00
8,000.0	5.00	270.00	7,991.1	0.0	-207.0	18.5	0.00	0.00	0.00
8,100.0	5.00	270.00	8,090.7	0.0	-215.7	19.2	0.00	0.00	0.00
8,200.0	5.00	270.00	8,190.4	0.0	-224.4	20.0	0.00	0.00	0.00
8,300.0	5.00	270.00	8,290.0	0.0	-233.1	20.8	0.00	0.00	0.00
8,400.0	5.00	270.00	8,389.6	0.0	-241.9	21.6	0.00	0.00	0.00
8,500.0	5.00	270.00	8,489.2	0.0	-250.6	22.3	0.00	0.00	0.00
8,600.0	5.00	270.00	8,588.8	0.0	-259.3	23.1	0.00	0.00	0.00
8,700.0	5.00	270.00	8,688.5	0.0	-268.0	23.9	0.00	0.00	0.00
8,800.0	5.00	270.00	8,788.1	0.0	-276.7	24.7	0.00	0.00	0.00
8,820.5	5.00	270.00	8,808.5	0.0	-278.5	24.8	0.00	0.00	0.00
Start DLS 10.00 TFO 61.56									
8,900.0	11.22	308.68	8,887.2	4.8	-288.0	30.5	10.00	7.83	48.65
9,000.0	20.79	319.79	8,983.2	24.5	-307.1	51.8	10.00	9.56	11.11
9,100.0	30.62	324.01	9,073.2	58.8	-333.6	88.3	10.00	9.84	4.22
9,200.0	40.53	326.31	9,154.5	106.5	-366.7	138.8	10.00	9.91	2.30
9,300.0	50.48	327.83	9,224.5	166.4	-405.4	201.8	10.00	9.94	1.52
9,400.0	60.43	328.97	9,281.1	236.5	-448.4	275.5	10.00	9.96	1.14
9,500.0	70.40	329.90	9,322.7	314.7	-494.6	357.5	10.00	9.96	0.93
9,600.0	80.36	330.72	9,347.9	398.6	-542.4	445.4	10.00	9.97	0.82
9,695.5	89.89	331.46	9,356.0	481.9	-588.4	532.4	10.00	9.97	0.77

Concho Resources LLC

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Well:	TOMAHAWK FEDERAL UNIT 713H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	PWP1	Database:	edm

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Start DLS 2.00 TFO 90.00									
9,700.0	89.89	331.55	9,356.0	485.8	-590.5	536.5	2.00	0.00	2.00
9,800.0	89.89	333.55	9,356.2	574.5	-636.6	629.0	2.00	0.00	2.00
9,900.0	89.89	335.55	9,356.4	664.8	-679.6	722.7	2.00	0.00	2.00
10,000.0	89.89	337.55	9,356.6	756.6	-719.4	817.7	2.00	0.00	2.00
10,100.0	89.89	339.55	9,356.8	849.6	-755.9	913.6	2.00	0.00	2.00
10,200.0	89.89	341.55	9,357.0	943.9	-789.2	1,010.5	2.00	0.00	2.00
10,300.0	89.89	343.55	9,357.1	1,039.3	-819.2	1,108.2	2.00	0.00	2.00
10,400.0	89.89	345.55	9,357.3	1,135.7	-845.9	1,206.6	2.00	0.00	2.00
10,500.0	89.89	347.55	9,357.5	1,232.9	-869.1	1,305.5	2.00	0.00	2.00
10,600.0	89.90	349.55	9,357.7	1,330.9	-889.0	1,404.9	2.00	0.00	2.00
10,700.0	89.90	351.55	9,357.9	1,429.6	-905.4	1,504.6	2.00	0.00	2.00
10,800.0	89.90	353.55	9,358.1	1,528.7	-918.4	1,604.5	2.00	0.00	2.00
10,900.0	89.90	355.55	9,358.2	1,628.3	-927.9	1,704.5	2.00	0.00	2.00
11,000.0	89.90	357.55	9,358.4	1,728.1	-933.9	1,804.5	2.00	0.00	2.00
11,100.0	89.90	359.55	9,358.6	1,828.0	-936.4	1,904.2	2.00	0.00	2.00
11,110.2	89.90	359.75	9,358.6	1,838.3	-936.5	1,914.4	2.00	0.00	2.00
Start 9060.3 hold at 11110.2 MD									
11,200.0	89.90	359.75	9,358.8	1,928.0	-936.9	2,003.9	0.00	0.00	0.00
11,300.0	89.90	359.75	9,358.9	2,028.0	-937.3	2,103.5	0.00	0.00	0.00
11,400.0	89.90	359.75	9,359.1	2,128.0	-937.7	2,203.2	0.00	0.00	0.00
11,500.0	89.90	359.75	9,359.3	2,228.0	-938.2	2,302.8	0.00	0.00	0.00
11,600.0	89.90	359.75	9,359.4	2,328.0	-938.6	2,402.4	0.00	0.00	0.00
11,700.0	89.90	359.75	9,359.6	2,428.0	-939.0	2,502.1	0.00	0.00	0.00
11,800.0	89.90	359.75	9,359.8	2,528.0	-939.4	2,601.7	0.00	0.00	0.00
11,900.0	89.90	359.75	9,359.9	2,628.0	-939.9	2,701.4	0.00	0.00	0.00
12,000.0	89.90	359.75	9,360.1	2,728.0	-940.3	2,801.0	0.00	0.00	0.00
12,100.0	89.90	359.75	9,360.3	2,828.0	-940.7	2,900.6	0.00	0.00	0.00
12,200.0	89.90	359.75	9,360.5	2,928.0	-941.2	3,000.3	0.00	0.00	0.00
12,300.0	89.90	359.75	9,360.6	3,028.0	-941.6	3,099.9	0.00	0.00	0.00
12,400.0	89.90	359.75	9,360.8	3,128.0	-942.0	3,199.6	0.00	0.00	0.00
12,500.0	89.90	359.75	9,361.0	3,228.0	-942.5	3,299.2	0.00	0.00	0.00
12,600.0	89.90	359.75	9,361.1	3,328.0	-942.9	3,398.8	0.00	0.00	0.00
12,700.0	89.90	359.75	9,361.3	3,428.0	-943.3	3,498.5	0.00	0.00	0.00
12,800.0	89.90	359.75	9,361.5	3,528.0	-943.7	3,598.1	0.00	0.00	0.00
12,900.0	89.90	359.75	9,361.6	3,628.0	-944.2	3,697.7	0.00	0.00	0.00
13,000.0	89.90	359.75	9,361.8	3,728.0	-944.6	3,797.4	0.00	0.00	0.00
13,100.0	89.90	359.75	9,362.0	3,828.0	-945.0	3,897.0	0.00	0.00	0.00
13,200.0	89.90	359.75	9,362.2	3,928.0	-945.5	3,996.7	0.00	0.00	0.00
13,300.0	89.90	359.75	9,362.3	4,028.0	-945.9	4,096.3	0.00	0.00	0.00
13,400.0	89.90	359.75	9,362.5	4,128.0	-946.3	4,195.9	0.00	0.00	0.00
13,500.0	89.90	359.75	9,362.7	4,228.0	-946.7	4,295.6	0.00	0.00	0.00
13,600.0	89.90	359.75	9,362.8	4,328.0	-947.2	4,395.2	0.00	0.00	0.00

Concho Resources LLC

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Well:	TOMAHAWK FEDERAL UNIT 713H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	PWP1	Database:	edm

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,700.0	89.90	359.75	9,363.0	4,428.0	-947.6	4,494.9	0.00	0.00	0.00
13,800.0	89.90	359.75	9,363.2	4,528.0	-948.0	4,594.5	0.00	0.00	0.00
13,900.0	89.90	359.75	9,363.3	4,628.0	-948.5	4,694.1	0.00	0.00	0.00
14,000.0	89.90	359.75	9,363.5	4,728.0	-948.9	4,793.8	0.00	0.00	0.00
14,100.0	89.90	359.75	9,363.7	4,828.0	-949.3	4,893.4	0.00	0.00	0.00
14,200.0	89.90	359.75	9,363.9	4,928.0	-949.8	4,993.1	0.00	0.00	0.00
14,300.0	89.90	359.75	9,364.0	5,028.0	-950.2	5,092.7	0.00	0.00	0.00
14,400.0	89.90	359.75	9,364.2	5,128.0	-950.6	5,192.3	0.00	0.00	0.00
14,500.0	89.90	359.75	9,364.4	5,228.0	-951.0	5,292.0	0.00	0.00	0.00
14,600.0	89.90	359.75	9,364.5	5,328.0	-951.5	5,391.6	0.00	0.00	0.00
14,700.0	89.90	359.75	9,364.7	5,428.0	-951.9	5,491.3	0.00	0.00	0.00
14,800.0	89.90	359.75	9,364.9	5,528.0	-952.3	5,590.9	0.00	0.00	0.00
14,900.0	89.90	359.75	9,365.0	5,628.0	-952.8	5,690.5	0.00	0.00	0.00
15,000.0	89.90	359.75	9,365.2	5,728.0	-953.2	5,790.2	0.00	0.00	0.00
15,100.0	89.90	359.75	9,365.4	5,828.0	-953.6	5,889.8	0.00	0.00	0.00
15,200.0	89.90	359.75	9,365.6	5,928.0	-954.0	5,989.4	0.00	0.00	0.00
15,300.0	89.90	359.75	9,365.7	6,028.0	-954.5	6,089.1	0.00	0.00	0.00
15,400.0	89.90	359.75	9,365.9	6,128.0	-954.9	6,188.7	0.00	0.00	0.00
15,500.0	89.90	359.75	9,366.1	6,228.0	-955.3	6,288.4	0.00	0.00	0.00
15,600.0	89.90	359.75	9,366.2	6,328.0	-955.8	6,388.0	0.00	0.00	0.00
15,700.0	89.90	359.75	9,366.4	6,428.0	-956.2	6,487.6	0.00	0.00	0.00
15,800.0	89.90	359.75	9,366.6	6,528.0	-956.6	6,587.3	0.00	0.00	0.00
15,900.0	89.90	359.75	9,366.7	6,628.0	-957.1	6,686.9	0.00	0.00	0.00
16,000.0	89.90	359.75	9,366.9	6,728.0	-957.5	6,786.6	0.00	0.00	0.00
16,100.0	89.90	359.75	9,367.1	6,828.0	-957.9	6,886.2	0.00	0.00	0.00
16,200.0	89.90	359.75	9,367.3	6,928.0	-958.3	6,985.8	0.00	0.00	0.00
16,300.0	89.90	359.75	9,367.4	7,028.0	-958.8	7,085.5	0.00	0.00	0.00
16,400.0	89.90	359.75	9,367.6	7,128.0	-959.2	7,185.1	0.00	0.00	0.00
16,500.0	89.90	359.75	9,367.8	7,228.0	-959.6	7,284.8	0.00	0.00	0.00
16,600.0	89.90	359.75	9,367.9	7,328.0	-960.1	7,384.4	0.00	0.00	0.00
16,700.0	89.90	359.75	9,368.1	7,428.0	-960.5	7,484.0	0.00	0.00	0.00
16,800.0	89.90	359.75	9,368.3	7,528.0	-960.9	7,583.7	0.00	0.00	0.00
16,900.0	89.90	359.75	9,368.4	7,628.0	-961.4	7,683.3	0.00	0.00	0.00
17,000.0	89.90	359.75	9,368.6	7,728.0	-961.8	7,783.0	0.00	0.00	0.00
17,100.0	89.90	359.75	9,368.8	7,828.0	-962.2	7,882.6	0.00	0.00	0.00
17,200.0	89.90	359.75	9,369.0	7,928.0	-962.6	7,982.2	0.00	0.00	0.00
17,300.0	89.90	359.75	9,369.1	8,028.0	-963.1	8,081.9	0.00	0.00	0.00
17,400.0	89.90	359.75	9,369.3	8,128.0	-963.5	8,181.5	0.00	0.00	0.00
17,500.0	89.90	359.75	9,369.5	8,228.0	-963.9	8,281.1	0.00	0.00	0.00
17,600.0	89.90	359.75	9,369.6	8,328.0	-964.4	8,380.8	0.00	0.00	0.00
17,700.0	89.90	359.75	9,369.8	8,428.0	-964.8	8,480.4	0.00	0.00	0.00
17,800.0	89.90	359.75	9,370.0	8,528.0	-965.2	8,580.1	0.00	0.00	0.00
17,900.0	89.90	359.75	9,370.1	8,628.0	-965.6	8,679.7	0.00	0.00	0.00
18,000.0	89.90	359.75	9,370.3	8,728.0	-966.1	8,779.3	0.00	0.00	0.00

Concho Resources LLC

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Well:	TOMAHAWK FEDERAL UNIT 713H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	PWP1	Database:	edm

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
18,100.0	89.90	359.75	9,370.5	8,828.0	-966.5	8,879.0	0.00	0.00	0.00
18,200.0	89.90	359.75	9,370.7	8,928.0	-966.9	8,978.6	0.00	0.00	0.00
18,300.0	89.90	359.75	9,370.8	9,028.0	-967.4	9,078.3	0.00	0.00	0.00
18,400.0	89.90	359.75	9,371.0	9,128.0	-967.8	9,177.9	0.00	0.00	0.00
18,500.0	89.90	359.75	9,371.2	9,228.0	-968.2	9,277.5	0.00	0.00	0.00
18,600.0	89.90	359.75	9,371.3	9,328.0	-968.7	9,377.2	0.00	0.00	0.00
18,700.0	89.90	359.75	9,371.5	9,428.0	-969.1	9,476.8	0.00	0.00	0.00
18,800.0	89.90	359.75	9,371.7	9,528.0	-969.5	9,576.5	0.00	0.00	0.00
18,900.0	89.90	359.75	9,371.8	9,628.0	-969.9	9,676.1	0.00	0.00	0.00
19,000.0	89.90	359.75	9,372.0	9,728.0	-970.4	9,775.7	0.00	0.00	0.00
19,100.0	89.90	359.75	9,372.2	9,828.0	-970.8	9,875.4	0.00	0.00	0.00
19,200.0	89.90	359.75	9,372.4	9,928.0	-971.2	9,975.0	0.00	0.00	0.00
19,300.0	89.90	359.75	9,372.5	10,028.0	-971.7	10,074.6	0.00	0.00	0.00
19,400.0	89.90	359.75	9,372.7	10,128.0	-972.1	10,174.3	0.00	0.00	0.00
19,500.0	89.90	359.75	9,372.9	10,228.0	-972.5	10,273.9	0.00	0.00	0.00
19,600.0	89.90	359.75	9,373.0	10,328.0	-972.9	10,373.6	0.00	0.00	0.00
19,700.0	89.90	359.75	9,373.2	10,428.0	-973.4	10,473.2	0.00	0.00	0.00
19,800.0	89.90	359.75	9,373.4	10,528.0	-973.8	10,572.8	0.00	0.00	0.00
19,900.0	89.90	359.75	9,373.5	10,627.9	-974.2	10,672.5	0.00	0.00	0.00
20,000.0	89.90	359.75	9,373.7	10,727.9	-974.7	10,772.1	0.00	0.00	0.00
20,100.0	89.90	359.75	9,373.9	10,827.9	-975.1	10,871.8	0.00	0.00	0.00
20,170.6	89.90	359.75	9,374.0	10,898.5	-975.4	10,942.1	0.00	0.00	0.00
TD at 20170.6									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
FTP (TOMAHAWK FE - hit/miss target - Shape - plan misses target center by 291.9usft at 9872.5usft MD (9356.3 TVD, 639.9 N, -668.1 E) - Circle (radius 50.0)	0.00	0.00	9,356.0	514.4	-931.7	435,046.50	567,510.30	32° 11' 45.138 N	104° 6' 54.322 W
PBHL (TOMAHAWK F - plan hits target center - Rectangle (sides W100.0 H10,384.2 D20.0)	-0.10	179.76	9,374.0	10,898.5	-975.4	445,430.60	567,466.60	32° 13' 27.903 N	104° 6' 54.585 W
LTP (TOMAHAWK FE - plan misses target center by 0.2usft at 20040.6usft MD (9373.8 TVD, 10768.5 N, -974.8 E) - Point	0.00	0.00	9,374.0	10,768.5	-974.9	445,300.60	567,467.10	32° 13' 26.617 N	104° 6' 54.583 W

Concho Resources LLC

Survey Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Well:	TOMAHAWK FEDERAL UNIT 713H	North Reference:	Grid
Wellbore:	OWB	Survey Calculation Method:	Minimum Curvature
Design:	PWP1	Database:	edm

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
5500	5500	0	0	Start Build 2.00
5750	5750	0	-11	Start 3070.5 hold at 5750.0 MD
8821	8809	0	-279	Start DLS 10.00 TFO 61.56
9696	9356	482	-588	Start DLS 2.00 TFO 90.00
11,110	9359	1838	-936	Start 9060.3 hold at 11110.2 MD
20,171	9374	10,899	-975	TD at 20170.6

Checked By: _____	Approved By: _____	Date: _____
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NORTHERN DELAWARE BASIN

EDDY COUNTY, NM

ATLAS

TOMAHAWK FEDERAL UNIT 713H

OWB

PWP1

Anticollision Report

16 March, 2020

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Reference	PWP1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum ellipse separation of 1,000.0 usft	Error Surface:	Pedal Curve
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date	3/16/2020		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	20,170.3	PWP1 (OWB)	MWD+IFR1+FDIR	OWSG MWD + IFR1 + FDIR Correction	

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
ATLAS						
BLACK EAGLE FED #1 - OWB - AWP	15,917.2	9,393.4	677.3	365.8	2.174	CC, ES, SF
TOMAHAWK FEDERAL UNIT #701H - OWB - PWP1						Out of range
TOMAHAWK FEDERAL UNIT #702H - OWB - PWP1						Out of range
TOMAHAWK FEDERAL UNIT #703H - OWB - PWP1	9,450.0	9,411.0	962.0	919.0	22.397	SF
TOMAHAWK FEDERAL UNIT #703H - OWB - PWP1	9,500.0	9,379.6	961.1	918.3	22.433	ES
TOMAHAWK FEDERAL UNIT #703H - OWB - PWP1	9,510.1	9,373.5	961.1	918.3	22.445	CC
TOMAHAWK FEDERAL UNIT #704H - OWB - PWP1	9,283.7	9,979.0	318.7	258.7	5.309	CC
TOMAHAWK FEDERAL UNIT #704H - OWB - PWP1	9,300.0	9,968.5	319.1	258.2	5.236	ES
TOMAHAWK FEDERAL UNIT #704H - OWB - PWP1	9,350.0	9,934.6	324.8	261.6	5.134	SF
TOMAHAWK FEDERAL UNIT #705H - OWB - PWP1	10,000.0	9,442.9	84.7	45.6	2.165	SF
TOMAHAWK FEDERAL UNIT #705H - OWB - PWP1	10,016.4	9,434.5	83.5	45.1	2.174	CC, ES
TOMAHAWK FEDERAL UNIT 709H - OWB - PWP1						Out of range
TOMAHAWK FEDERAL UNIT 710H - OWB - PWP1						Out of range
TOMAHAWK FEDERAL UNIT 711H - OWB - PWP1	2,500.0	2,499.2	60.0	41.5	3.249	CC, ES
TOMAHAWK FEDERAL UNIT 711H - OWB - PWP1	2,600.0	2,597.1	61.7	42.6	3.226	SF
TOMAHAWK FEDERAL UNIT 712H - OWB - PWP1	5,500.0	5,499.5	30.0	5.4	1.222	Shut in Produces, CC, ES

Offset Design												ATLAS - BLACK EAGLE FED #1 - OWB - AWP		Offset Site Error:		0.0 usft
Survey Program: 450-INC-ONLY														Offset Well Error:		3.0 usft
Reference		Offset		Semi Major Axis		Distance						Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)			Separation Factor		
15,200.0	9,365.6	9,392.2	9,388.1	60.7	245.9	89.90	6,648.1	-279.8	986.5	688.7	297.73	3.313	CC, ES, SF			
15,300.0	9,365.7	9,392.4	9,388.2	61.4	245.9	89.91	6,648.1	-279.8	916.3	616.4	299.93	3.055				
15,400.0	9,365.9	9,392.6	9,388.4	62.1	245.9	89.93	6,648.1	-279.8	852.2	549.9	302.32	2.819				
15,500.0	9,366.1	9,392.7	9,388.6	62.8	245.9	89.94	6,648.1	-279.8	795.5	490.7	304.82	2.610				
15,600.0	9,366.2	9,392.9	9,388.7	63.6	245.9	89.95	6,648.1	-279.8	747.9	440.7	307.25	2.434				
15,700.0	9,366.4	9,393.1	9,388.9	64.3	246.0	89.97	6,648.1	-279.8	711.3	401.9	309.38	2.299				
15,800.0	9,366.6	9,393.2	9,389.1	65.0	246.0	89.98	6,648.1	-279.8	687.4	376.5	310.90	2.211				
15,900.0	9,366.7	9,393.4	9,389.2	65.8	246.0	90.00	6,648.1	-279.8	677.5	366.0	311.56	2.175				
15,917.2	9,366.8	9,393.4	9,389.3	65.9	246.0	90.00	6,648.1	-279.8	677.3	365.8	311.58					
16,000.0	9,366.9	9,393.6	9,389.4	66.5	246.0	90.01	6,648.1	-279.8	682.4	371.1	311.23	2.193				
16,100.0	9,367.1	9,393.8	9,389.6	67.2	246.0	90.03	6,648.1	-279.8	701.6	391.6	309.98	2.263				
16,200.0	9,367.3	9,393.9	9,389.8	68.0	246.0	90.04	6,648.1	-279.8	734.0	426.0	308.04	2.383				

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

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Offset Design ATLAS - BLACK EAGLE FED #1 - OWB - AWP												Offset Site Error:	0.0 usft
Survey Program: 450-INC-ONLY												Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
16,300.0	9,367.4	9,394.1	9,389.9	68.7	246.0	90.06	6,648.1	-279.8	778.0	472.3	305.72	2.545	
16,400.0	9,367.6	9,394.3	9,390.1	69.5	246.0	90.07	6,648.1	-279.8	831.8	528.5	303.28	2.743	
16,500.0	9,367.8	9,394.4	9,390.3	70.2	246.0	90.08	6,648.1	-279.8	893.6	592.7	300.92	2.969	
16,600.0	9,367.9	9,394.6	9,390.4	71.0	246.0	90.10	6,648.1	-279.8	961.8	663.0	298.75	3.219	

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Offset Design ATLAS - TOMAHAWK FEDERAL UNIT #703H - OWB - PWP1												Offset Site Error:	0.0 usft
Survey Program: 0-Standard Keeper 104, 8863-MWD+IFR1+FDIR												Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
9,150.0	9,115.1	9,651.5	9,391.4	32.4	11.1	101.07	598.1	457.0	996.5	953.3	43.19	23.070	
9,200.0	9,154.5	9,599.0	9,381.1	32.5	10.9	98.49	642.5	431.0	987.0	943.8	43.20	22.849	
9,250.0	9,191.0	9,554.3	9,368.6	32.6	10.7	96.35	679.4	409.1	979.0	935.8	43.19	22.668	
9,300.0	9,224.5	9,514.5	9,354.8	32.8	10.6	94.45	711.4	389.8	972.5	929.4	43.16	22.532	
9,350.0	9,254.6	9,478.0	9,339.8	32.9	10.5	92.68	739.8	372.4	967.6	924.5	43.11	22.443	
9,400.0	9,281.1	9,443.7	9,323.9	33.0	10.5	90.99	765.6	356.4	964.1	921.0	43.04	22.399	
9,450.0	9,303.9	9,411.0	9,307.1	33.1	10.4	89.33	789.3	341.6	962.0	919.0	42.95	22.397	SF
9,500.0	9,322.7	9,379.6	9,289.4	33.2	10.3	87.69	811.2	327.6	961.1	918.3	42.85	22.433	ES
9,510.1	9,326.0	9,373.5	9,285.7	33.2	10.3	87.36	815.4	324.9	961.1	918.3	42.82	22.445	CC
9,550.0	9,337.4	9,349.2	9,270.9	33.3	10.3	86.05	831.5	314.5	961.5	918.7	42.72	22.506	
9,600.0	9,347.9	9,319.5	9,251.7	33.4	10.2	84.43	850.5	302.1	962.8	920.2	42.59	22.607	
9,650.0	9,354.1	9,290.4	9,231.8	33.5	10.2	82.83	868.1	290.4	965.1	922.6	42.45	22.736	
9,695.5	9,356.0	9,264.4	9,213.1	33.6	10.2	81.39	883.2	280.3	967.7	925.4	42.31	22.872	
9,700.0	9,356.0	9,261.8	9,211.2	33.6	10.2	81.28	884.6	279.3	968.0	925.7	42.30	22.886	
9,800.0	9,356.2	9,211.3	9,172.5	33.7	10.1	79.00	911.3	260.8	976.3	934.3	42.00	23.243	
9,900.0	9,356.4	9,170.5	9,139.3	33.9	10.1	77.09	930.5	247.1	988.5	946.8	41.72	23.695	

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 0-MWD+IFR1+FDIR												Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
8,400.0	8,389.6	10,133.2	9,382.0	29.8	34.2	179.26	2.6	-126.3	997.3	963.8	33.49	29.776	
8,500.0	8,489.2	10,133.4	9,382.0	30.1	34.2	179.32	2.4	-126.3	899.6	865.6	34.04	26.427	
8,600.0	8,588.8	10,133.6	9,382.0	30.5	34.2	179.39	2.2	-126.3	802.4	767.7	34.72	23.114	
8,700.0	8,688.5	10,133.8	9,382.0	30.8	34.2	179.45	1.9	-126.3	706.1	670.5	35.59	19.838	
8,800.0	8,788.1	10,134.0	9,382.0	31.2	34.2	179.51	1.7	-126.3	610.9	574.1	36.80	16.603	
8,820.5	8,808.5	10,134.1	9,382.0	31.3	34.2	179.53	1.7	-126.3	591.6	554.5	37.10	15.946	
8,850.0	8,837.8	10,133.5	9,382.0	31.4	34.2	163.90	2.3	-126.3	564.1	526.5	37.60	15.005	
8,900.0	8,887.2	10,129.4	9,382.0	31.5	34.2	154.96	6.3	-126.3	518.8	480.2	38.65	13.425	
8,950.0	8,935.8	10,121.5	9,382.0	31.7	34.2	152.35	14.2	-126.3	475.9	435.8	40.05	11.883	
9,000.0	8,983.2	10,109.9	9,381.9	31.9	34.2	150.85	25.8	-126.3	436.1	394.2	41.90	10.410	
9,050.0	9,029.2	10,094.7	9,381.9	32.1	34.1	149.22	41.1	-126.3	400.6	356.3	44.28	9.045	
9,100.0	9,073.2	10,075.9	9,381.8	32.2	34.1	147.11	59.9	-126.4	370.2	323.0	47.25	7.836	
9,150.0	9,115.1	10,053.6	9,381.8	32.4	34.1	144.37	82.1	-126.4	346.2	295.5	50.69	6.830	
9,200.0	9,154.5	10,028.2	9,381.7	32.5	34.0	140.96	107.5	-126.5	329.4	275.1	54.37	6.060	
9,250.0	9,191.0	9,999.8	9,381.7	32.6	34.0	136.86	136.0	-126.5	320.4	262.5	57.91	5.533	
9,283.7	9,213.9	9,979.0	9,381.6	32.7	33.9	133.73	156.8	-126.6	318.7	258.7	60.03	5.309 CC	
9,300.0	9,224.5	9,968.5	9,381.6	32.8	33.9	132.11	167.3	-126.6	319.1	258.2	60.95	5.236 ES	
9,350.0	9,254.6	9,934.6	9,381.5	32.9	33.9	126.83	201.1	-126.7	324.8	261.6	63.27	5.134 SF	
9,400.0	9,281.1	9,898.4	9,381.4	33.0	33.8	121.19	237.3	-126.7	336.4	271.6	64.84	5.188	
9,450.0	9,303.9	9,860.2	9,381.3	33.1	33.8	115.44	275.5	-126.8	352.6	286.8	65.82	5.358	
9,500.0	9,322.7	9,820.2	9,381.2	33.2	33.7	109.87	315.5	-126.9	372.1	305.7	66.36	5.607	
9,550.0	9,337.4	9,778.8	9,381.1	33.3	33.7	104.70	356.9	-127.0	393.7	327.0	66.63	5.908	
9,600.0	9,347.9	9,736.2	9,381.0	33.4	33.6	100.12	399.5	-127.0	416.6	349.8	66.76	6.240	
9,650.0	9,354.1	9,690.7	9,380.7	33.5	33.6	96.16	445.0	-127.2	440.1	373.2	66.81	6.586	
9,695.5	9,356.0	9,649.3	9,378.0	33.6	33.5	92.89	486.4	-127.4	461.4	394.6	66.83	6.904	
9,700.0	9,356.0	9,645.2	9,377.5	33.6	33.5	92.82	490.4	-127.4	463.5	396.7	66.83	6.936	
9,800.0	9,356.2	9,556.0	9,360.9	33.7	33.4	90.42	578.0	-127.9	508.7	441.9	66.82	7.614	
9,900.0	9,356.4	9,472.4	9,333.2	33.9	33.2	87.18	656.8	-128.3	551.9	485.2	66.68	8.277	
10,000.0	9,356.6	9,397.1	9,298.6	34.1	33.1	83.66	723.6	-128.6	594.7	528.3	66.37	8.959	
10,100.0	9,356.8	9,331.2	9,261.5	34.3	33.0	80.26	777.9	-128.9	638.5	572.6	65.94	9.684	
10,200.0	9,357.0	9,274.7	9,224.8	34.6	32.8	77.20	820.9	-129.2	684.7	619.2	65.45	10.462	
10,300.0	9,357.1	9,226.5	9,190.3	34.8	32.7	74.59	854.6	-129.3	733.9	668.9	64.98	11.294	
10,400.0	9,357.3	9,185.5	9,158.8	35.1	32.6	72.43	880.7	-129.5	786.4	721.8	64.57	12.178	
10,500.0	9,357.5	9,150.0	9,130.0	35.4	32.5	70.66	901.6	-129.6	842.2	777.9	64.25	13.108	
10,600.0	9,357.7	9,121.0	9,105.6	35.7	32.4	69.37	917.3	-129.7	901.2	837.1	64.04	14.072	
10,700.0	9,357.9	9,100.0	9,087.5	36.0	32.4	68.65	927.9	-129.7	963.0	899.1	63.97	15.056	

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 0-Standard Keeper 104, 8844-MWD+IFR1+FDIR												Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
8,800.0	8,788.1	10,020.9	9,362.8	31.2	12.6	18.67	223.7	-991.4	942.5	901.0	41.55	22.686	
8,820.5	8,808.5	10,021.7	9,362.8	31.3	12.6	18.61	223.0	-991.6	928.9	887.1	41.74	22.256	
8,850.0	8,837.8	10,022.1	9,362.8	31.4	12.6	-5.23	222.6	-991.8	909.3	867.3	42.01	21.647	
8,900.0	8,887.2	10,019.5	9,362.8	31.5	12.6	-24.70	225.0	-991.0	875.5	833.1	42.43	20.632	
8,950.0	8,935.8	10,012.9	9,362.8	31.7	12.5	-34.69	231.4	-989.0	841.1	798.3	42.82	19.644	
9,000.0	8,983.2	10,002.4	9,362.7	31.9	12.5	-41.29	241.4	-985.8	806.1	763.0	43.15	18.681	
9,050.0	9,029.2	9,988.2	9,362.7	32.1	12.4	-46.29	254.9	-981.5	770.8	727.4	43.44	17.743	
9,100.0	9,073.2	9,970.5	9,362.7	32.2	12.4	-50.35	271.8	-976.0	735.1	691.4	43.68	16.830	
9,150.0	9,115.1	9,949.6	9,362.6	32.4	12.3	-53.81	291.5	-969.4	699.1	655.2	43.86	15.939	
9,200.0	9,154.5	9,925.9	9,362.5	32.5	12.2	-56.83	314.0	-961.7	662.8	618.8	43.99	15.068	
9,250.0	9,191.0	9,899.7	9,362.5	32.6	12.0	-59.56	338.7	-953.0	626.2	582.2	44.07	14.211	
9,300.0	9,224.5	9,871.3	9,362.4	32.8	11.9	-62.11	365.4	-943.3	589.3	545.2	44.11	13.361	
9,350.0	9,254.6	9,841.2	9,362.3	32.9	11.8	-64.58	393.6	-932.7	552.1	508.0	44.10	12.518	
9,400.0	9,281.1	9,809.7	9,362.3	33.0	11.7	-67.08	422.9	-921.3	514.4	470.3	44.06	11.675	
9,450.0	9,303.9	9,777.1	9,362.2	33.1	11.6	-69.74	453.1	-909.2	476.3	432.3	43.99	10.825	
9,500.0	9,322.7	9,743.9	9,362.1	33.2	11.5	-72.70	483.8	-896.5	437.6	393.7	43.91	9.967	
9,550.0	9,337.4	9,710.5	9,361.9	33.3	11.3	-76.12	514.6	-883.4	398.5	354.7	43.80	9.098	
9,600.0	9,347.9	9,678.1	9,360.3	33.4	11.2	-79.90	544.3	-870.4	359.0	315.3	43.69	8.216	
9,650.0	9,354.1	9,646.4	9,356.9	33.5	11.1	-83.95	573.0	-857.6	319.2	275.6	43.57	7.326	
9,695.5	9,356.0	9,618.0	9,352.4	33.6	11.1	-87.85	598.6	-846.0	282.8	239.4	43.45	6.510	
9,700.0	9,356.0	9,615.2	9,351.9	33.6	11.1	-87.65	601.1	-844.8	279.3	235.9	43.44	6.430	
9,800.0	9,356.2	9,554.2	9,337.4	33.7	10.9	-80.49	654.7	-819.8	201.1	158.0	43.07	4.668	
9,900.0	9,356.4	9,496.5	9,318.0	33.9	10.8	-65.54	703.5	-796.1	129.4	87.2	42.18	3.067	
10,000.0	9,356.6	9,442.9	9,295.2	34.1	10.6	-40.47	746.9	-774.3	84.7	45.6	39.12	2.165 SF	
10,016.4	9,356.6	9,434.5	9,291.3	34.1	10.6	-35.79	753.4	-770.9	83.5	45.1	38.41	2.174 CC, ES	
10,100.0	9,356.8	9,393.8	9,270.5	34.3	10.5	-13.66	784.5	-754.6	110.0	71.2	38.80	2.836	
10,200.0	9,357.0	9,350.0	9,245.5	34.6	10.5	4.31	816.1	-737.6	178.8	137.7	41.12	4.348	
10,300.0	9,357.1	9,309.1	9,219.7	34.8	10.4	15.19	843.8	-722.0	259.2	217.2	42.00	6.172	
10,400.0	9,357.3	9,273.1	9,195.3	35.1	10.4	21.81	866.7	-708.8	343.8	301.4	42.42	8.106	
10,500.0	9,357.5	9,250.0	9,178.7	35.4	10.3	26.16	880.5	-700.5	430.6	387.9	42.72	10.081	
10,600.0	9,357.7	9,212.1	9,150.2	35.7	10.3	29.94	901.8	-687.4	518.5	475.7	42.81	12.112	
10,700.0	9,357.9	9,186.2	9,129.9	36.0	10.3	32.93	915.2	-678.8	607.4	564.5	42.92	14.151	
10,800.0	9,358.1	9,163.0	9,111.1	36.3	10.2	35.62	926.6	-671.3	697.0	654.0	43.02	16.204	
10,900.0	9,358.2	9,150.0	9,100.3	36.6	10.2	38.48	932.6	-667.2	787.2	744.1	43.12	18.259	
11,000.0	9,358.4	9,123.2	9,077.6	36.9	10.2	40.55	944.2	-659.0	877.6	834.5	43.16	20.333	
11,100.0	9,358.6	9,100.0	9,057.4	37.3	10.2	42.56	953.4	-652.2	968.4	925.2	43.21	22.412	
11,110.2	9,358.6	9,100.0	9,057.4	37.3	10.2	42.88	953.4	-652.2	977.7	934.5	43.22	22.622	

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 0-MWD+IFR1+FDIR												Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Tooface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.0	0.0	0.0	0.0	3.0	3.0	90.38	-0.4	60.0	60.0				
100.0	100.0	99.2	99.2	3.0	3.0	90.38	-0.4	60.0	60.0	54.0	6.01	9.991	
200.0	200.0	199.2	199.2	3.0	3.0	90.38	-0.4	60.0	60.0	53.9	6.08	9.871	
300.0	300.0	299.2	299.2	3.1	3.1	90.38	-0.4	60.0	60.0	53.8	6.23	9.625	
400.0	400.0	399.2	399.2	3.2	3.2	90.38	-0.4	60.0	60.0	53.5	6.47	9.280	
500.0	500.0	499.2	499.2	3.4	3.4	90.38	-0.4	60.0	60.0	53.2	6.77	8.868	
600.0	600.0	599.2	599.2	3.6	3.6	90.38	-0.4	60.0	60.0	52.9	7.13	8.421	
700.0	700.0	699.2	699.2	3.8	3.8	90.38	-0.4	60.0	60.0	52.5	7.54	7.961	
800.0	800.0	799.2	799.2	4.0	4.0	90.38	-0.4	60.0	60.0	52.0	7.99	7.509	
900.0	900.0	899.2	899.2	4.2	4.2	90.38	-0.4	60.0	60.0	51.5	8.48	7.075	
1,000.0	1,000.0	999.2	999.2	4.5	4.5	90.38	-0.4	60.0	60.0	51.0	9.00	6.665	
1,100.0	1,100.0	1,099.2	1,099.2	4.8	4.8	90.38	-0.4	60.0	60.0	50.5	9.55	6.284	
1,200.0	1,200.0	1,199.2	1,199.2	5.1	5.1	90.38	-0.4	60.0	60.0	49.9	10.12	5.931	
1,300.0	1,300.0	1,299.2	1,299.2	5.4	5.3	90.38	-0.4	60.0	60.0	49.3	10.70	5.606	
1,400.0	1,400.0	1,399.2	1,399.2	5.7	5.7	90.38	-0.4	60.0	60.0	48.7	11.30	5.308	
1,500.0	1,500.0	1,499.2	1,499.2	6.0	6.0	90.38	-0.4	60.0	60.0	48.1	11.92	5.035	
1,600.0	1,600.0	1,599.2	1,599.2	6.3	6.3	90.38	-0.4	60.0	60.0	47.5	12.54	4.784	
1,700.0	1,700.0	1,699.2	1,699.2	6.6	6.6	90.38	-0.4	60.0	60.0	46.8	13.18	4.554	
1,800.0	1,800.0	1,799.2	1,799.2	6.9	6.9	90.38	-0.4	60.0	60.0	46.2	13.82	4.342	
1,900.0	1,900.0	1,899.2	1,899.2	7.2	7.2	90.38	-0.4	60.0	60.0	45.5	14.47	4.148	
2,000.0	2,000.0	1,999.2	1,999.2	7.6	7.6	90.38	-0.4	60.0	60.0	44.9	15.12	3.968	
2,100.0	2,100.0	2,099.2	2,099.2	7.9	7.9	90.38	-0.4	60.0	60.0	44.2	15.78	3.802	
2,200.0	2,200.0	2,199.2	2,199.2	8.2	8.2	90.38	-0.4	60.0	60.0	43.6	16.45	3.648	
2,300.0	2,300.0	2,299.2	2,299.2	8.6	8.6	90.38	-0.4	60.0	60.0	42.9	17.12	3.505	
2,400.0	2,400.0	2,399.2	2,399.2	8.9	8.9	90.38	-0.4	60.0	60.0	42.2	17.79	3.373	
2,500.0	2,500.0	2,499.2	2,499.2	9.2	9.2	90.38	-0.4	60.0	60.0	41.5	18.47	3.249 CC, ES	
2,600.0	2,600.0	2,597.1	2,597.1	9.6	9.6	90.37	-0.4	61.6	61.7	42.6	19.12	3.226 SF	
2,700.0	2,700.0	2,694.8	2,694.7	9.9	9.9	90.34	-0.4	66.6	66.8	47.0	19.75	3.381	
2,800.0	2,800.0	2,792.0	2,791.5	10.3	10.2	90.31	-0.4	74.9	75.3	54.9	20.36	3.697	
2,900.0	2,900.0	2,891.3	2,890.2	10.6	10.5	90.27	-0.4	85.2	85.7	64.7	21.02	4.077	
3,000.0	3,000.0	2,990.7	2,989.1	10.9	10.9	90.24	-0.4	95.6	96.2	74.5	21.69	4.433	
3,100.0	3,100.0	3,090.2	3,088.1	11.3	11.2	90.22	-0.4	106.0	106.6	84.2	22.37	4.766	
3,200.0	3,200.0	3,189.6	3,187.0	11.6	11.5	90.20	-0.4	116.4	117.1	94.0	23.04	5.080	
3,300.0	3,300.0	3,289.1	3,285.9	12.0	11.9	90.18	-0.4	126.8	127.5	103.8	23.72	5.375	
3,400.0	3,400.0	3,388.6	3,384.8	12.3	12.2	90.17	-0.4	137.2	138.0	113.6	24.41	5.653	
3,500.0	3,500.0	3,488.0	3,483.7	12.7	12.5	90.16	-0.4	147.6	148.4	123.3	25.09	5.915	
3,600.0	3,600.0	3,587.5	3,582.6	13.0	12.9	90.15	-0.4	158.0	158.9	133.1	25.78	6.163	
3,700.0	3,700.0	3,686.9	3,681.5	13.4	13.2	90.14	-0.4	168.4	169.3	142.9	26.47	6.398	
3,800.0	3,800.0	3,786.4	3,780.4	13.7	13.6	90.13	-0.4	178.8	179.8	152.6	27.16	6.620	
3,900.0	3,900.0	3,885.8	3,879.3	14.1	13.9	90.12	-0.4	189.2	190.2	162.4	27.85	6.831	
4,000.0	4,000.0	3,985.3	3,978.2	14.4	14.3	90.11	-0.4	199.6	200.7	172.1	28.54	7.032	
4,100.0	4,100.0	4,084.7	4,077.1	14.8	14.6	90.11	-0.4	210.0	211.1	181.9	29.23	7.222	
4,200.0	4,200.0	4,184.2	4,176.0	15.1	15.0	90.10	-0.4	220.4	221.6	191.7	29.93	7.404	
4,300.0	4,300.0	4,283.6	4,274.9	15.5	15.3	90.10	-0.4	230.8	232.0	201.4	30.63	7.577	
4,400.0	4,400.0	4,383.1	4,373.9	15.8	15.6	90.10	-0.4	241.2	242.5	211.2	31.32	7.741	
4,500.0	4,500.0	4,482.5	4,472.8	16.2	16.0	90.09	-0.4	251.6	253.0	220.9	32.02	7.899	
4,600.0	4,600.0	4,582.0	4,571.7	16.5	16.3	90.09	-0.4	262.0	263.4	230.7	32.72	8.049	
4,700.0	4,700.0	4,681.4	4,670.6	16.9	16.7	90.08	-0.4	272.4	273.9	240.4	33.42	8.193	
4,800.0	4,800.0	4,780.9	4,769.5	17.2	17.0	90.08	-0.4	282.8	284.3	250.2	34.13	8.331	
4,900.0	4,900.0	4,880.3	4,868.4	17.6	17.4	90.08	-0.4	293.1	294.8	259.9	34.83	8.463	
5,000.0	5,000.0	4,979.8	4,967.3	17.9	17.8	90.08	-0.4	303.5	305.2	269.7	35.53	8.590	
5,100.0	5,100.0	5,079.2	5,066.2	18.3	18.1	90.07	-0.4	313.9	315.7	279.4	36.24	8.712	

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

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 0-MWD+IFR1+FDIR												Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.0	5,200.0	5,178.7	5,165.1	18.7	18.5	90.07	-0.4	324.3	326.1	289.2	36.94	8.828	
5,300.0	5,300.0	5,278.1	5,264.0	19.0	18.8	90.07	-0.4	334.7	336.6	298.9	37.65	8.941	
5,400.0	5,400.0	5,377.6	5,362.9	19.4	19.2	90.07	-0.4	345.1	347.0	308.7	38.35	9.049	
5,500.0	5,500.0	5,477.0	5,461.8	19.7	19.5	90.06	-0.4	355.5	357.5	318.4	39.06	9.153	
5,600.0	5,600.0	5,576.3	5,560.5	20.1	19.9	-179.94	-0.4	365.9	369.7	329.9	39.75	9.299	
5,700.0	5,699.8	5,675.1	5,658.8	20.4	20.2	-179.94	-0.4	376.2	385.3	344.9	40.44	9.528	
5,750.0	5,749.7	5,724.2	5,707.7	20.6	20.4	-179.94	-0.4	381.4	394.4	353.6	40.78	9.671	
5,800.0	5,799.5	5,773.3	5,756.5	20.7	20.6	-179.94	-0.4	386.5	404.0	362.8	41.13	9.823	
5,900.0	5,899.1	5,871.5	5,854.1	21.1	20.9	-179.94	-0.4	396.7	423.0	381.2	41.81	10.119	
6,000.0	5,998.7	5,969.6	5,951.7	21.4	21.3	-179.95	-0.4	407.0	442.1	399.6	42.49	10.405	
6,100.0	6,098.4	6,067.8	6,049.3	21.8	21.6	-179.95	-0.4	417.3	461.2	418.0	43.18	10.682	
6,200.0	6,198.0	6,166.0	6,147.0	22.1	22.0	-179.95	-0.4	427.5	480.3	436.4	43.86	10.949	
6,300.0	6,297.6	6,264.1	6,244.6	22.4	22.3	-179.95	-0.4	437.8	499.4	454.8	44.55	11.209	
6,400.0	6,397.2	6,362.3	6,342.2	22.8	22.7	-179.95	-0.4	448.1	518.4	473.2	45.24	11.460	
6,500.0	6,496.8	6,460.4	6,439.8	23.1	23.0	-179.96	-0.4	458.3	537.5	491.6	45.93	11.704	
6,600.0	6,596.4	6,558.6	6,537.5	23.5	23.4	-179.96	-0.4	468.6	556.6	510.0	46.62	11.940	
6,700.0	6,696.1	6,656.8	6,635.1	23.8	23.8	-179.96	-0.4	478.8	575.7	528.4	47.31	12.168	
6,800.0	6,795.7	6,754.9	6,732.7	24.2	24.1	-179.96	-0.4	489.1	594.8	546.8	48.00	12.391	
6,900.0	6,895.3	6,853.1	6,830.3	24.5	24.5	-179.96	-0.4	499.4	613.9	565.2	48.69	12.606	
7,000.0	6,994.9	6,951.3	6,928.0	24.9	24.8	-179.96	-0.4	509.6	632.9	583.5	49.39	12.815	
7,100.0	7,094.5	7,049.4	7,025.6	25.2	25.2	-179.96	-0.4	519.9	652.0	601.9	50.08	13.019	
7,200.0	7,194.2	7,147.6	7,123.2	25.6	25.5	-179.97	-0.4	530.1	671.1	620.3	50.78	13.216	
7,300.0	7,293.8	7,245.7	7,220.8	25.9	25.9	-179.97	-0.4	540.4	690.2	638.7	51.47	13.408	
7,400.0	7,393.4	7,343.9	7,318.5	26.3	26.2	-179.97	-0.4	550.7	709.3	657.1	52.17	13.595	
7,500.0	7,493.0	7,442.1	7,416.1	26.6	26.6	-179.97	-0.4	560.9	728.3	675.5	52.87	13.777	
7,600.0	7,592.6	7,540.2	7,513.7	27.0	26.9	-179.97	-0.4	571.2	747.4	693.9	53.56	13.954	
7,700.0	7,692.3	7,638.4	7,611.3	27.3	27.3	-179.97	-0.4	581.4	766.5	712.2	54.26	14.126	
7,800.0	7,791.9	7,736.6	7,709.0	27.7	27.6	-179.97	-0.4	591.7	785.6	730.6	54.96	14.293	
7,900.0	7,891.5	7,834.7	7,806.6	28.0	28.0	-179.97	-0.4	602.0	804.7	749.0	55.66	14.457	
8,000.0	7,991.1	7,932.9	7,904.2	28.4	28.4	-179.97	-0.4	612.2	823.7	767.4	56.36	14.616	
8,100.0	8,090.7	8,031.0	8,001.8	28.7	28.7	-179.97	-0.4	622.5	842.8	785.8	57.06	14.771	
8,200.0	8,190.4	8,129.2	8,099.5	29.1	29.1	-179.97	-0.4	632.7	861.9	804.1	57.76	14.922	
8,300.0	8,290.0	8,227.4	8,197.1	29.4	29.4	-179.97	-0.4	643.0	881.0	822.5	58.46	15.069	
8,400.0	8,389.6	8,325.5	8,294.7	29.8	29.8	-179.97	-0.4	653.3	900.1	840.9	59.17	15.213	
8,500.0	8,489.2	8,423.7	8,392.3	30.1	30.1	-179.97	-0.4	663.5	919.1	859.3	59.87	15.353	
8,600.0	8,588.8	8,521.9	8,490.0	30.5	30.5	-179.98	-0.4	673.8	938.2	877.7	60.57	15.490	
8,700.0	8,688.5	8,620.0	8,587.6	30.8	30.9	-179.98	-0.4	684.1	957.3	896.0	61.27	15.623	
8,800.0	8,788.1	8,718.2	8,685.2	31.2	31.2	-179.98	-0.4	694.3	976.4	914.4	61.98	15.754	
8,820.5	8,808.5	8,738.3	8,705.2	31.3	31.3	-179.98	-0.4	696.4	980.3	918.2	62.12	15.780	
8,850.0	8,837.8	8,767.2	8,733.9	31.4	31.4	157.54	-0.4	699.4	986.3	924.0	62.33	15.823	
8,900.0	8,887.2	8,815.6	8,782.1	31.5	31.6	140.33	-0.4	704.5	998.0	935.3	62.68	15.922	

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 0-Standard Keeper 104, 8803-MWD+IFR1+FDIR												Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	3.0	3.0	90.57	-0.3	30.0	30.0				
100.0	100.0	99.5	99.5	3.0	3.0	90.57	-0.3	30.0	30.0	24.0	6.00	4.998	
200.0	200.0	199.5	199.5	3.0	3.0	90.57	-0.3	30.0	30.0	24.0	6.04	4.966	
300.0	300.0	299.5	299.5	3.1	3.0	90.57	-0.3	30.0	30.0	23.9	6.12	4.901	
400.0	400.0	399.5	399.5	3.2	3.0	90.57	-0.3	30.0	30.0	23.8	6.24	4.806	
500.0	500.0	499.5	499.5	3.4	3.1	90.57	-0.3	30.0	30.0	23.6	6.40	4.689	
600.0	600.0	599.5	599.5	3.6	3.1	90.57	-0.3	30.0	30.0	23.4	6.59	4.555	
700.0	700.0	699.5	699.5	3.8	3.1	90.57	-0.3	30.0	30.0	23.2	6.80	4.411	
800.0	800.0	799.5	799.5	4.0	3.2	90.57	-0.3	30.0	30.0	23.0	7.04	4.262	
900.0	900.0	899.5	899.5	4.2	3.2	90.57	-0.3	30.0	30.0	22.7	7.30	4.111	
1,000.0	1,000.0	999.5	999.5	4.5	3.2	90.57	-0.3	30.0	30.0	22.4	7.57	3.962	
1,100.0	1,100.0	1,099.5	1,099.5	4.8	3.3	90.57	-0.3	30.0	30.0	22.1	7.86	3.816	
1,200.0	1,200.0	1,199.5	1,199.5	5.1	3.4	90.57	-0.3	30.0	30.0	21.8	8.16	3.676	
1,300.0	1,300.0	1,299.5	1,299.5	5.4	3.4	90.57	-0.3	30.0	30.0	21.5	8.47	3.540	
1,400.0	1,400.0	1,399.5	1,399.5	5.7	3.5	90.57	-0.3	30.0	30.0	21.2	8.79	3.411	
1,500.0	1,500.0	1,499.5	1,499.5	6.0	3.5	90.57	-0.3	30.0	30.0	20.9	9.12	3.289	
1,600.0	1,600.0	1,599.5	1,599.5	6.3	3.6	90.57	-0.3	30.0	30.0	20.5	9.46	3.172	
1,700.0	1,700.0	1,699.5	1,699.5	6.6	3.7	90.57	-0.3	30.0	30.0	20.2	9.80	3.062	
1,800.0	1,800.0	1,799.5	1,799.5	6.9	3.8	90.57	-0.3	30.0	30.0	19.9	10.15	2.957	
1,900.0	1,900.0	1,899.5	1,899.5	7.2	3.9	90.57	-0.3	30.0	30.0	19.5	10.50	2.858	
2,000.0	2,000.0	1,999.5	1,999.5	7.6	3.9	90.57	-0.3	30.0	30.0	19.1	10.85	2.764	
2,100.0	2,100.0	2,099.5	2,099.5	7.9	4.0	90.57	-0.3	30.0	30.0	18.8	11.21	2.676	
2,200.0	2,200.0	2,199.5	2,199.5	8.2	4.1	90.57	-0.3	30.0	30.0	18.4	11.58	2.592	
2,300.0	2,300.0	2,299.5	2,299.5	8.6	4.2	90.57	-0.3	30.0	30.0	18.1	11.94	2.512	
2,400.0	2,400.0	2,399.5	2,399.5	8.9	4.3	90.57	-0.3	30.0	30.0	17.7	12.31	2.437	
2,500.0	2,500.0	2,499.5	2,499.5	9.2	4.4	90.57	-0.3	30.0	30.0	17.3	12.68	2.365	
2,600.0	2,600.0	2,599.5	2,599.5	9.6	4.5	90.57	-0.3	30.0	30.0	16.9	13.06	2.297	
2,700.0	2,700.0	2,699.5	2,699.5	9.9	4.6	90.57	-0.3	30.0	30.0	16.6	13.44	2.233	
2,800.0	2,800.0	2,799.5	2,799.5	10.3	4.7	90.57	-0.3	30.0	30.0	16.2	13.81	2.172	
2,900.0	2,900.0	2,899.5	2,899.5	10.6	4.8	90.57	-0.3	30.0	30.0	15.8	14.20	2.113	
3,000.0	3,000.0	2,999.5	2,999.5	10.9	4.9	90.57	-0.3	30.0	30.0	15.4	14.58	2.058	
3,100.0	3,100.0	3,099.5	3,099.5	11.3	5.0	90.57	-0.3	30.0	30.0	15.0	14.96	2.005	
3,200.0	3,200.0	3,199.5	3,199.5	11.6	5.1	90.57	-0.3	30.0	30.0	14.7	15.35	1.954 Advise and Monitor	
3,300.0	3,300.0	3,299.5	3,299.5	12.0	5.2	90.57	-0.3	30.0	30.0	14.3	15.74	1.906 Advise and Monitor	
3,400.0	3,400.0	3,399.5	3,399.5	12.3	5.3	90.57	-0.3	30.0	30.0	13.9	16.13	1.860 Advise and Monitor	
3,500.0	3,500.0	3,499.5	3,499.5	12.7	5.4	90.57	-0.3	30.0	30.0	13.5	16.52	1.816 Advise and Monitor	
3,600.0	3,600.0	3,599.5	3,599.5	13.0	5.5	90.57	-0.3	30.0	30.0	13.1	16.91	1.774 Advise and Monitor	
3,700.0	3,700.0	3,699.5	3,699.5	13.4	5.7	90.57	-0.3	30.0	30.0	12.7	17.31	1.734 Advise and Monitor	
3,800.0	3,800.0	3,799.5	3,799.5	13.7	5.8	90.57	-0.3	30.0	30.0	12.3	17.70	1.695 Advise and Monitor	
3,900.0	3,900.0	3,899.5	3,899.5	14.1	5.9	90.57	-0.3	30.0	30.0	11.9	18.10	1.658 Advise and Monitor	
4,000.0	4,000.0	3,999.5	3,999.5	14.4	6.0	90.57	-0.3	30.0	30.0	11.5	18.50	1.622 Advise and Monitor	
4,100.0	4,100.0	4,099.5	4,099.5	14.8	6.1	90.57	-0.3	30.0	30.0	11.1	18.89	1.588 Advise and Monitor	
4,200.0	4,200.0	4,199.5	4,199.5	15.1	6.2	90.57	-0.3	30.0	30.0	10.7	19.29	1.555 Advise and Monitor	
4,300.0	4,300.0	4,299.5	4,299.5	15.5	6.3	90.57	-0.3	30.0	30.0	10.3	19.69	1.523 Advise and Monitor	
4,400.0	4,400.0	4,399.5	4,399.5	15.8	6.5	90.57	-0.3	30.0	30.0	9.9	20.09	1.493 Shut in Produces	
4,500.0	4,500.0	4,499.5	4,499.5	16.2	6.6	90.57	-0.3	30.0	30.0	9.5	20.50	1.464 Shut in Produces	
4,600.0	4,600.0	4,599.5	4,599.5	16.5	6.7	90.57	-0.3	30.0	30.0	9.1	20.90	1.436 Shut in Produces	
4,700.0	4,700.0	4,699.5	4,699.5	16.9	6.8	90.57	-0.3	30.0	30.0	8.7	21.30	1.408 Shut in Produces	
4,800.0	4,800.0	4,799.5	4,799.5	17.2	6.9	90.57	-0.3	30.0	30.0	8.3	21.71	1.382 Shut in Produces	
4,900.0	4,900.0	4,899.5	4,899.5	17.6	7.0	90.57	-0.3	30.0	30.0	7.9	22.11	1.357 Shut in Produces	
5,000.0	5,000.0	4,999.5	4,999.5	17.9	7.2	90.57	-0.3	30.0	30.0	7.5	22.52	1.332 Shut in Produces	
5,100.0	5,100.0	5,099.5	5,099.5	18.3	7.3	90.57	-0.3	30.0	30.0	7.1	22.92	1.309 Shut in Produces	

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

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 0-Standard Keeper 104, 8803-MWD+IFR1+FDIR												Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,200.0	5,200.0	5,199.5	5,199.5	18.7	7.4	90.57	-0.3	30.0	30.0	6.7	23.33	1.286	Shut in Produces
5,300.0	5,300.0	5,299.5	5,299.5	19.0	7.5	90.57	-0.3	30.0	30.0	6.3	23.74	1.264	Shut in Produces
5,400.0	5,400.0	5,399.5	5,399.5	19.4	7.6	90.57	-0.3	30.0	30.0	5.9	24.15	1.242	Shut in Produces
5,500.0	5,500.0	5,499.5	5,499.5	19.7	7.8	90.57	-0.3	30.0	30.0	5.4	24.56	1.222	Shut in Produces, CC, ES, SF
5,600.0	5,600.0	5,599.5	5,599.5	20.1	7.9	-179.46	-0.3	30.0	31.7	6.8	24.96	1.272	Shut in Produces
5,700.0	5,699.8	5,699.3	5,699.3	20.4	8.0	-179.53	-0.3	30.0	37.0	11.6	25.35	1.459	Shut in Produces
5,750.0	5,749.7	5,749.2	5,749.2	20.6	8.1	-179.58	-0.3	30.0	40.9	15.4	25.54	1.601	Advise and Monitor
5,800.0	5,799.5	5,799.0	5,799.0	20.7	8.1	-179.62	-0.3	30.0	45.3	19.5	25.74	1.758	Advise and Monitor
5,900.0	5,899.1	5,898.6	5,898.6	21.1	8.3	-179.68	-0.3	30.0	54.0	27.8	26.13	2.066	
6,000.0	5,998.7	5,998.2	5,998.2	21.4	8.4	-179.72	-0.3	30.0	62.7	36.2	26.52	2.364	
6,100.0	6,098.4	6,097.9	6,097.9	21.8	8.5	-179.76	-0.3	30.0	71.4	44.5	26.92	2.653	
6,200.0	6,198.0	6,197.5	6,197.5	22.1	8.6	-179.78	-0.3	30.0	80.1	52.8	27.31	2.933	
6,300.0	6,297.6	6,297.1	6,297.1	22.4	8.7	-179.81	-0.3	30.0	88.8	61.1	27.71	3.206	
6,400.0	6,397.2	6,396.7	6,396.7	22.8	8.9	-179.82	-0.3	30.0	97.6	69.4	28.11	3.471	
6,500.0	6,496.8	6,496.3	6,496.3	23.1	9.0	-179.84	-0.3	30.0	106.3	77.8	28.51	3.728	
6,600.0	6,596.4	6,595.9	6,595.9	23.5	9.1	-179.85	-0.3	30.0	115.0	86.1	28.91	3.978	
6,700.0	6,696.1	6,695.6	6,695.6	23.8	9.2	-179.86	-0.3	30.0	123.7	94.4	29.31	4.221	
6,800.0	6,795.7	6,795.2	6,795.2	24.2	9.4	-179.87	-0.3	30.0	132.4	102.7	29.71	4.457	
6,900.0	6,895.3	6,894.8	6,894.8	24.5	9.5	-179.88	-0.3	30.0	141.1	111.0	30.11	4.687	
7,000.0	6,994.9	6,994.4	6,994.4	24.9	9.6	-179.88	-0.3	30.0	149.8	119.3	30.51	4.911	
7,100.0	7,094.5	7,094.0	7,094.0	25.2	9.7	-179.89	-0.3	30.0	158.6	127.6	30.92	5.129	
7,200.0	7,194.2	7,193.7	7,193.7	25.6	9.9	-179.90	-0.3	30.0	167.3	136.0	31.32	5.341	
7,300.0	7,293.8	7,293.3	7,293.3	25.9	10.0	-179.90	-0.3	30.0	176.0	144.3	31.73	5.547	
7,400.0	7,393.4	7,392.9	7,392.9	26.3	10.1	-179.91	-0.3	30.0	184.7	152.6	32.13	5.749	
7,500.0	7,493.0	7,492.5	7,492.5	26.6	10.2	-179.91	-0.3	30.0	193.4	160.9	32.54	5.945	
7,600.0	7,592.6	7,592.1	7,592.1	27.0	10.4	-179.91	-0.3	30.0	202.1	169.2	32.94	6.136	
7,700.0	7,692.3	7,691.8	7,691.8	27.3	10.5	-179.92	-0.3	30.0	210.9	177.5	33.35	6.322	
7,800.0	7,791.9	7,791.4	7,791.4	27.7	10.6	-179.92	-0.3	30.0	219.6	185.8	33.76	6.504	
7,900.0	7,891.5	7,891.0	7,891.0	28.0	10.7	-179.92	-0.3	30.0	228.3	194.1	34.17	6.681	
8,000.0	7,991.1	7,990.6	7,990.6	28.4	10.9	-179.93	-0.3	30.0	237.0	202.4	34.58	6.854	
8,100.0	8,090.7	8,090.2	8,090.2	28.7	11.0	-179.93	-0.3	30.0	245.7	210.7	34.99	7.023	
8,200.0	8,190.4	8,189.9	8,189.9	29.1	11.1	-179.93	-0.3	30.0	254.4	219.0	35.40	7.187	
8,300.0	8,290.0	8,289.5	8,289.5	29.4	11.3	-179.93	-0.3	30.0	263.1	227.3	35.81	7.348	
8,400.0	8,389.6	8,389.1	8,389.1	29.8	11.4	-179.94	-0.3	30.0	271.9	235.6	36.22	7.505	
8,500.0	8,489.2	8,488.7	8,488.7	30.1	11.5	-179.94	-0.3	30.0	280.6	243.9	36.63	7.659	
8,600.0	8,588.8	8,588.3	8,588.3	30.5	11.6	-179.94	-0.3	30.0	289.3	252.2	37.05	7.809	
8,700.0	8,688.5	8,688.0	8,688.0	30.8	11.8	-179.94	-0.3	30.0	298.0	260.6	37.46	7.955	
8,800.0	8,788.1	8,787.6	8,787.6	31.2	11.9	-179.94	-0.3	30.0	306.7	268.9	37.87	8.099	
8,820.5	8,808.5	8,808.0	8,808.0	31.3	11.9	-179.95	-0.3	30.0	308.5	270.6	37.96	8.128	
8,850.0	8,837.8	8,837.4	8,837.4	31.4	12.0	157.74	0.7	30.0	311.4	273.4	38.07	8.181	
8,900.0	8,887.2	8,887.0	8,886.7	31.5	12.0	140.60	5.9	30.0	318.0	279.8	38.26	8.313	
8,950.0	8,935.8	8,936.2	8,935.0	31.7	12.0	132.61	15.1	29.9	326.6	288.1	38.44	8.496	
9,000.0	8,983.2	8,984.9	8,981.9	31.9	12.0	127.64	28.3	29.9	337.1	298.4	38.62	8.727	
9,050.0	9,029.2	9,033.0	9,026.9	32.1	12.0	123.92	45.3	29.8	349.4	310.6	38.81	9.004	
9,100.0	9,073.2	9,080.5	9,069.8	32.2	12.1	120.78	65.6	29.8	363.5	324.5	38.99	9.322	
9,150.0	9,115.1	9,127.4	9,110.3	32.4	12.1	117.93	89.1	29.7	379.2	340.0	39.17	9.680	
9,200.0	9,154.5	9,173.6	9,148.3	32.5	12.1	115.23	115.4	29.6	396.4	357.1	39.35	10.073	
9,250.0	9,191.0	9,219.2	9,183.6	32.6	12.2	112.63	144.3	29.5	415.1	375.5	39.54	10.498	
9,300.0	9,224.5	9,264.2	9,216.0	32.8	12.2	110.07	175.5	29.4	434.9	395.2	39.72	10.949	
9,350.0	9,254.6	9,308.8	9,245.6	32.9	12.3	107.54	208.8	29.3	455.8	415.9	39.91	11.423	
9,400.0	9,281.1	9,352.9	9,272.3	33.0	12.3	105.05	244.0	29.1	477.7	437.6	40.09	11.914	
9,450.0	9,303.9	9,396.7	9,296.0	33.1	12.4	102.59	280.8	29.0	500.3	460.0	40.29	12.418	

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

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 0-Standard Keeper 104, 8803-MWD+IFR1+FDIR												Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
9,500.0	9,322.7	9,440.4	9,316.8	33.2	12.4	100.18	319.1	28.9	523.5	483.0	40.49	12.930	
9,550.0	9,337.4	9,484.0	9,334.6	33.3	12.5	97.83	358.9	28.7	547.1	506.4	40.69	13.446	
9,600.0	9,347.9	9,527.6	9,349.3	33.4	12.5	95.55	400.0	28.6	571.0	530.1	40.91	13.960	
9,650.0	9,354.1	9,571.5	9,360.9	33.5	12.6	93.36	442.3	28.5	595.0	553.9	41.13	14.468	
9,695.5	9,356.0	9,611.9	9,368.7	33.6	12.6	91.46	481.9	28.3	616.8	575.5	41.34	14.922	
9,700.0	9,356.0	9,615.8	9,369.3	33.6	12.6	91.52	485.8	28.3	619.0	577.6	41.36	14.966	
9,800.0	9,356.2	9,707.6	9,376.0	33.7	12.6	92.00	577.2	28.0	664.9	623.0	41.87	15.881	
9,900.0	9,356.4	9,798.0	9,376.1	33.9	12.7	91.85	667.7	27.6	707.5	665.1	42.44	16.671	
10,000.0	9,356.6	9,889.9	9,376.3	34.1	12.7	91.72	759.6	27.2	746.9	703.8	43.09	17.335	
10,100.0	9,356.8	9,983.1	9,376.4	34.3	12.7	91.61	852.8	26.8	783.1	739.3	43.80	17.877	
10,200.0	9,357.0	10,077.6	9,376.6	34.6	12.8	91.53	947.2	26.5	816.0	771.4	44.58	18.303	
10,300.0	9,357.1	10,173.1	9,376.8	34.8	12.8	91.45	1,042.7	26.1	845.5	800.1	45.42	18.618	
10,400.0	9,357.3	10,269.6	9,376.9	35.1	12.8	91.39	1,139.2	25.7	871.8	825.5	46.30	18.828	
10,500.0	9,357.5	10,366.9	9,377.1	35.4	12.9	91.34	1,236.6	25.3	894.6	847.4	47.24	18.940	
10,600.0	9,357.7	10,465.0	9,377.3	35.7	13.1	91.30	1,334.7	24.9	914.1	865.9	48.21	18.960	
10,700.0	9,357.9	10,563.7	9,377.5	36.0	13.8	91.26	1,433.4	24.5	930.1	880.9	49.22	18.895	
10,800.0	9,358.1	10,662.9	9,377.6	36.3	14.6	91.24	1,532.6	24.1	942.6	892.4	50.27	18.752	
10,900.0	9,358.2	10,762.5	9,377.8	36.6	15.3	91.22	1,632.1	23.6	951.7	900.4	51.34	18.536	
11,000.0	9,358.4	10,862.3	9,378.0	36.9	16.1	91.21	1,732.0	23.2	957.3	904.9	52.45	18.254	
11,100.0	9,358.6	10,962.3	9,378.2	37.3	16.9	91.20	1,832.0	22.8	959.5	905.9	53.57	17.911	
11,110.2	9,358.6	10,972.5	9,378.2	37.3	16.9	91.20	1,842.2	22.8	959.5	905.8	53.68	17.873	
11,200.0	9,358.8	11,062.3	9,378.3	37.6	17.7	91.20	1,932.0	22.4	959.5	904.8	54.71	17.537	
11,300.0	9,358.9	11,162.3	9,378.5	38.0	18.4	91.20	2,031.9	22.0	959.5	903.6	55.88	17.171	
11,400.0	9,359.1	11,262.3	9,378.7	38.4	19.2	91.20	2,131.9	21.6	959.5	902.5	57.07	16.813	
11,500.0	9,359.3	11,362.3	9,378.9	38.8	20.0	91.20	2,231.9	21.2	959.6	901.3	58.28	16.464	
11,600.0	9,359.4	11,462.3	9,379.0	39.2	20.9	91.20	2,331.9	20.8	959.6	900.1	59.51	16.124	
11,700.0	9,359.6	11,562.3	9,379.2	39.6	21.7	91.20	2,431.9	20.4	959.6	898.8	60.76	15.793	
11,800.0	9,359.8	11,662.3	9,379.4	40.0	22.5	91.20	2,531.9	19.9	959.6	897.6	62.03	15.471	
11,900.0	9,359.9	11,762.3	9,379.6	40.5	23.3	91.20	2,631.9	19.5	959.6	896.3	63.31	15.158	
12,000.0	9,360.1	11,862.3	9,379.7	41.0	24.1	91.20	2,731.9	19.1	959.6	895.0	64.61	14.853	
12,100.0	9,360.3	11,962.3	9,379.9	41.4	25.0	91.20	2,831.9	18.7	959.7	893.7	65.92	14.557	
12,200.0	9,360.5	12,062.3	9,380.1	41.9	25.8	91.20	2,931.9	18.3	959.7	892.4	67.25	14.270	
12,300.0	9,360.6	12,162.3	9,380.2	42.4	26.6	91.20	3,031.9	17.9	959.7	891.1	68.60	13.990	
12,400.0	9,360.8	12,262.3	9,380.4	42.9	27.4	91.20	3,131.9	17.5	959.7	889.8	69.95	13.719	
12,500.0	9,361.0	12,362.3	9,380.6	43.5	28.3	91.20	3,231.9	17.1	959.7	888.4	71.32	13.456	
12,600.0	9,361.1	12,462.3	9,380.8	44.0	29.1	91.20	3,331.9	16.7	959.8	887.1	72.71	13.201	
12,700.0	9,361.3	12,562.3	9,380.9	44.6	30.0	91.20	3,431.9	16.2	959.8	885.7	74.10	12.953	
12,800.0	9,361.5	12,662.3	9,381.1	45.1	30.8	91.20	3,531.9	15.8	959.8	884.3	75.50	12.712	
12,900.0	9,361.6	12,762.3	9,381.3	45.7	31.6	91.20	3,631.9	15.4	959.8	882.9	76.92	12.478	
13,000.0	9,361.8	12,862.3	9,381.5	46.3	32.5	91.20	3,731.9	15.0	959.8	881.5	78.34	12.251	
13,100.0	9,362.0	12,962.3	9,381.6	46.8	33.3	91.20	3,831.9	14.6	959.9	880.1	79.78	12.031	
13,200.0	9,362.2	13,062.3	9,381.8	47.4	34.2	91.20	3,931.9	14.2	959.9	878.6	81.22	11.818	
13,300.0	9,362.3	13,162.3	9,382.0	48.0	35.0	91.20	4,031.9	13.8	959.9	877.2	82.68	11.610	
13,400.0	9,362.5	13,262.3	9,382.2	48.6	35.9	91.20	4,131.9	13.4	959.9	875.8	84.14	11.409	
13,500.0	9,362.7	13,362.3	9,382.3	49.3	36.7	91.20	4,231.9	13.0	959.9	874.3	85.61	11.213	
13,600.0	9,362.8	13,462.3	9,382.5	49.9	37.5	91.20	4,331.9	12.5	959.9	872.9	87.09	11.023	
13,700.0	9,363.0	13,562.3	9,382.7	50.5	38.4	91.21	4,431.9	12.1	960.0	871.4	88.57	10.838	
13,800.0	9,363.2	13,662.3	9,382.9	51.2	39.2	91.21	4,531.9	11.7	960.0	869.9	90.07	10.659	
13,900.0	9,363.3	13,762.3	9,383.0	51.8	40.1	91.21	4,631.9	11.3	960.0	868.4	91.57	10.484	
14,000.0	9,363.5	13,862.3	9,383.2	52.5	40.9	91.21	4,731.9	10.9	960.0	866.9	93.07	10.315	
14,100.0	9,363.7	13,962.3	9,383.4	53.1	41.8	91.21	4,831.9	10.5	960.0	865.4	94.59	10.150	
14,200.0	9,363.9	14,062.3	9,383.6	53.8	42.6	91.21	4,931.9	10.1	960.1	863.9	96.11	9.989	

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

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.0 usft
Survey Program: 0-Standard Keeper 104, 8803-MWD+IFR1+FDIR												Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
14,300.0	9,364.0	14,162.3	9,383.7	54.4	43.5	91.21	5,031.9	9.7	960.1	862.4	97.63	9.834	
14,400.0	9,364.2	14,262.3	9,383.9	55.1	44.3	91.21	5,131.9	9.3	960.1	860.9	99.16	9.682	
14,500.0	9,364.4	14,362.3	9,384.1	55.8	45.2	91.21	5,231.9	8.8	960.1	859.4	100.70	9.534	
14,600.0	9,364.5	14,462.3	9,384.3	56.5	46.0	91.21	5,331.9	8.4	960.1	857.9	102.24	9.391	
14,700.0	9,364.7	14,562.3	9,384.4	57.2	46.9	91.21	5,431.9	8.0	960.1	856.4	103.79	9.251	
14,800.0	9,364.9	14,662.3	9,384.6	57.9	47.8	91.21	5,531.9	7.6	960.2	854.8	105.34	9.115	
14,900.0	9,365.0	14,762.3	9,384.8	58.6	48.6	91.21	5,631.9	7.2	960.2	853.3	106.90	8.982	
15,000.0	9,365.2	14,862.3	9,385.0	59.3	49.5	91.21	5,731.9	6.8	960.2	851.7	108.46	8.853	
15,100.0	9,365.4	14,962.3	9,385.1	60.0	50.3	91.21	5,831.9	6.4	960.2	850.2	110.03	8.727	
15,200.0	9,365.6	15,062.3	9,385.3	60.7	51.2	91.21	5,931.9	6.0	960.2	848.6	111.60	8.605	
15,300.0	9,365.7	15,162.3	9,385.5	61.4	52.0	91.21	6,031.9	5.6	960.3	847.1	113.17	8.485	
15,400.0	9,365.9	15,262.3	9,385.7	62.1	52.9	91.21	6,131.9	5.2	960.3	845.5	114.75	8.369	
15,500.0	9,366.1	15,362.3	9,385.8	62.8	53.7	91.21	6,231.9	4.7	960.3	844.0	116.33	8.255	
15,600.0	9,366.2	15,462.3	9,386.0	63.6	54.6	91.21	6,331.9	4.3	960.3	842.4	117.92	8.144	
15,700.0	9,366.4	15,562.3	9,386.2	64.3	55.4	91.21	6,431.9	3.9	960.3	840.8	119.50	8.036	
15,800.0	9,366.6	15,662.3	9,386.4	65.0	56.3	91.21	6,531.9	3.5	960.4	839.3	121.10	7.930	
15,900.0	9,366.7	15,762.3	9,386.5	65.8	57.2	91.21	6,631.9	3.1	960.4	837.7	122.69	7.827	
16,000.0	9,366.9	15,862.3	9,386.7	66.5	58.0	91.21	6,731.9	2.7	960.4	836.1	124.29	7.727	
16,100.0	9,367.1	15,962.3	9,386.9	67.2	58.9	91.21	6,831.9	2.3	960.4	834.5	125.89	7.629	
16,200.0	9,367.3	16,062.3	9,387.1	68.0	59.7	91.21	6,931.9	1.9	960.4	832.9	127.50	7.533	
16,300.0	9,367.4	16,162.3	9,387.2	68.7	60.6	91.21	7,031.9	1.5	960.4	831.3	129.11	7.439	
16,400.0	9,367.6	16,262.3	9,387.4	69.5	61.4	91.21	7,131.9	1.0	960.5	829.7	130.72	7.348	
16,500.0	9,367.8	16,362.3	9,387.6	70.2	62.3	91.21	7,231.9	0.6	960.5	828.2	132.33	7.258	
16,600.0	9,367.9	16,462.3	9,387.8	71.0	63.2	91.21	7,331.9	0.2	960.5	826.6	133.95	7.171	
16,700.0	9,368.1	16,562.3	9,387.9	71.8	64.0	91.21	7,431.9	-0.2	960.5	825.0	135.56	7.085	
16,800.0	9,368.3	16,662.3	9,388.1	72.5	64.9	91.21	7,531.9	-0.6	960.5	823.4	137.19	7.002	
16,900.0	9,368.4	16,762.3	9,388.3	73.3	65.7	91.21	7,631.9	-1.0	960.6	821.8	138.81	6.920	
17,000.0	9,368.6	16,862.3	9,388.4	74.0	66.6	91.21	7,731.9	-1.4	960.6	820.1	140.43	6.840	
17,100.0	9,368.8	16,962.3	9,388.6	74.8	67.4	91.21	7,831.9	-1.8	960.6	818.5	142.06	6.762	
17,200.0	9,369.0	17,062.3	9,388.8	75.6	68.3	91.21	7,931.9	-2.2	960.6	816.9	143.69	6.685	
17,300.0	9,369.1	17,162.3	9,389.0	76.3	69.2	91.21	8,031.9	-2.7	960.6	815.3	145.32	6.610	
17,400.0	9,369.3	17,262.3	9,389.1	77.1	70.0	91.21	8,131.9	-3.1	960.7	813.7	146.96	6.537	
17,500.0	9,369.5	17,362.3	9,389.3	77.9	70.9	91.21	8,231.9	-3.5	960.7	812.1	148.59	6.465	
17,600.0	9,369.6	17,462.3	9,389.5	78.7	71.7	91.21	8,331.9	-3.9	960.7	810.5	150.23	6.395	
17,700.0	9,369.8	17,562.3	9,389.7	79.5	72.6	91.21	8,431.9	-4.3	960.7	808.8	151.87	6.326	
17,800.0	9,370.0	17,662.3	9,389.8	80.2	73.5	91.22	8,531.9	-4.7	960.7	807.2	153.51	6.258	
17,900.0	9,370.1	17,762.3	9,390.0	81.0	74.3	91.22	8,631.9	-5.1	960.7	805.6	155.15	6.192	
18,000.0	9,370.3	17,862.3	9,390.2	81.8	75.2	91.22	8,731.9	-5.5	960.8	804.0	156.80	6.127	
18,100.0	9,370.5	17,962.3	9,390.4	82.6	76.0	91.22	8,831.9	-5.9	960.8	802.3	158.45	6.064	
18,200.0	9,370.7	18,062.3	9,390.5	83.4	76.9	91.22	8,931.9	-6.4	960.8	800.7	160.09	6.002	
18,300.0	9,370.8	18,162.3	9,390.7	84.2	77.7	91.22	9,031.9	-6.8	960.8	799.1	161.74	5.940	
18,400.0	9,371.0	18,262.3	9,390.9	84.9	78.6	91.22	9,131.9	-7.2	960.8	797.4	163.39	5.881	
18,500.0	9,371.2	18,362.3	9,391.1	85.7	79.5	91.22	9,231.9	-7.6	960.9	795.8	165.05	5.822	
18,600.0	9,371.3	18,462.3	9,391.2	86.5	80.3	91.22	9,331.9	-8.0	960.9	794.2	166.70	5.764	
18,700.0	9,371.5	18,562.3	9,391.4	87.3	81.2	91.22	9,431.9	-8.4	960.9	792.5	168.35	5.708	
18,800.0	9,371.7	18,662.3	9,391.6	88.1	82.0	91.22	9,531.9	-8.8	960.9	790.9	170.01	5.652	
18,900.0	9,371.8	18,762.3	9,391.8	88.9	82.9	91.22	9,631.9	-9.2	960.9	789.3	171.67	5.598	
19,000.0	9,372.0	18,862.3	9,391.9	89.7	83.8	91.22	9,731.9	-9.6	961.0	787.6	173.33	5.544	
19,100.0	9,372.2	18,962.3	9,392.1	90.5	84.6	91.22	9,831.9	-10.1	961.0	786.0	174.99	5.492	
19,200.0	9,372.4	19,062.3	9,392.3	91.3	85.5	91.22	9,931.9	-10.5	961.0	784.3	176.65	5.440	
19,300.0	9,372.5	19,162.3	9,392.5	92.1	86.3	91.22	10,031.9	-10.9	961.0	782.7	178.31	5.389	
19,400.0	9,372.7	19,262.3	9,392.6	92.9	87.2	91.22	10,131.9	-11.3	961.0	781.0	179.98	5.340	

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

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

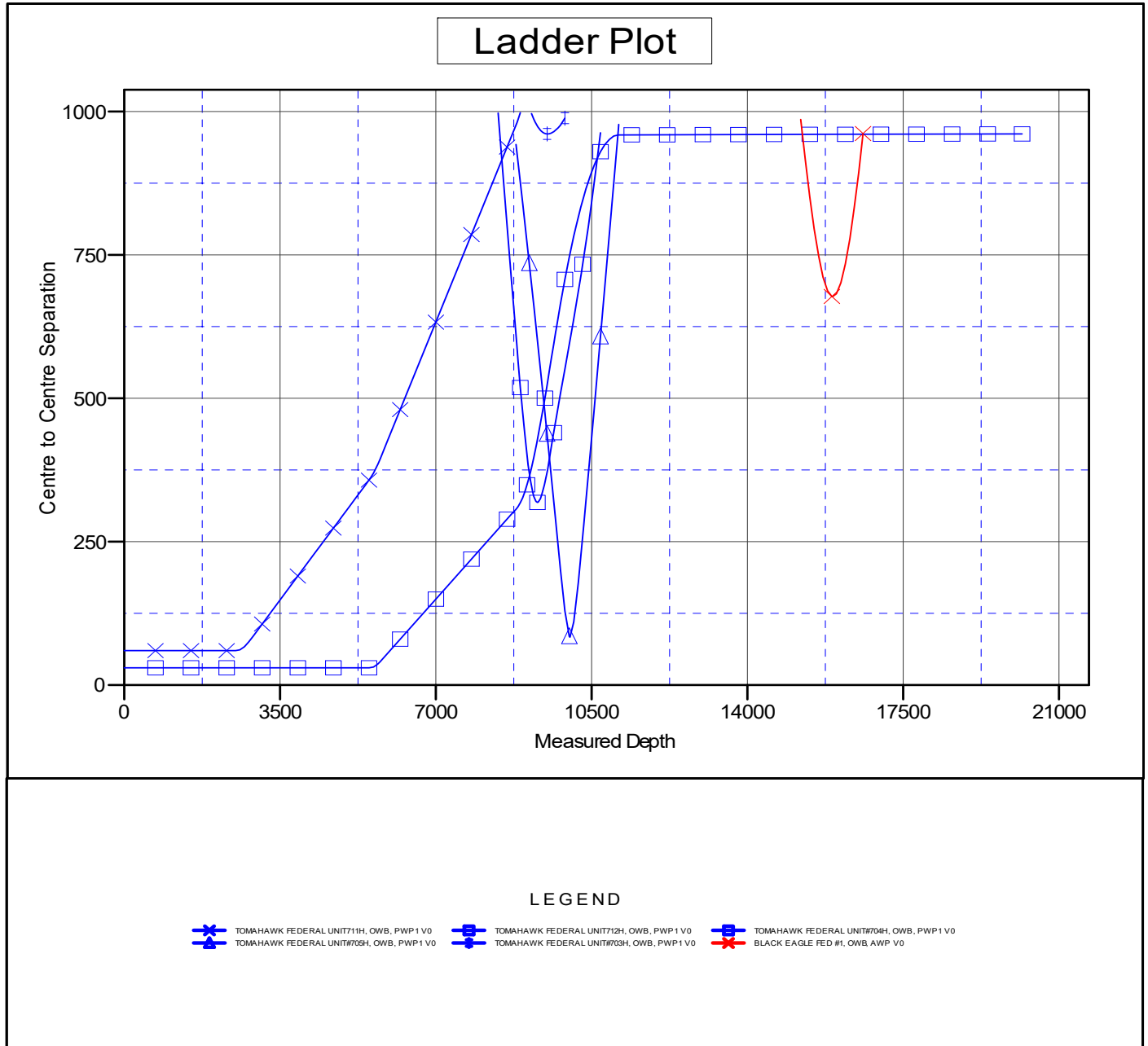
Offset Design ATLAS - TOMAHAWK FEDERAL UNIT 712H - OWB - PWP1													Offset Site Error:	0.0 usft
Survey Program: 0-Standard Keeper 104, 8803-MWD+IFR1+FDIR													Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(usft)	(usft)	(usft)	(usft)	(usft)	(usft)	(°)	+N/-S (usft)	+E/-W (usft)	(usft)	(usft)	(usft)			
19,500.0	9,372.9	19,362.3	9,392.8	93.7	88.1	91.22	10,231.9	-11.7	961.0	779.4	181.64	5.291		
19,600.0	9,373.0	19,462.3	9,393.0	94.5	88.9	91.22	10,331.9	-12.1	961.1	777.8	183.31	5.243		
19,700.0	9,373.2	19,562.3	9,393.2	95.3	89.8	91.22	10,431.9	-12.5	961.1	776.1	184.97	5.196		
19,800.0	9,373.4	19,662.3	9,393.3	96.1	90.6	91.22	10,531.9	-12.9	961.1	774.5	186.64	5.149		
19,900.0	9,373.5	19,762.3	9,393.5	96.9	91.5	91.22	10,631.9	-13.3	961.1	772.8	188.31	5.104		
20,000.0	9,373.7	19,862.3	9,393.7	97.7	92.4	91.22	10,731.9	-13.8	961.1	771.2	189.98	5.059		
20,100.0	9,373.9	19,962.3	9,393.9	98.6	93.2	91.22	10,831.9	-14.2	961.2	769.5	191.65	5.015		
20,170.6	9,374.0	20,032.9	9,394.0	99.1	93.8	91.22	10,902.4	-14.5	961.2	768.3	192.83	4.985		
20,171.1	9,374.0	20,033.4	9,394.0	99.2	93.8	91.22	10,903.0	-14.5	961.2	768.3	192.84	4.984		

Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB=27' @ 3069.5usft (SCAN FREE) Coordinates are relative to: TOMAHAWK FEDERAL UNIT 713H
 Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Central Meridian is 104° 20' 0.000 W Grid Convergence at Surface is: 0.12°



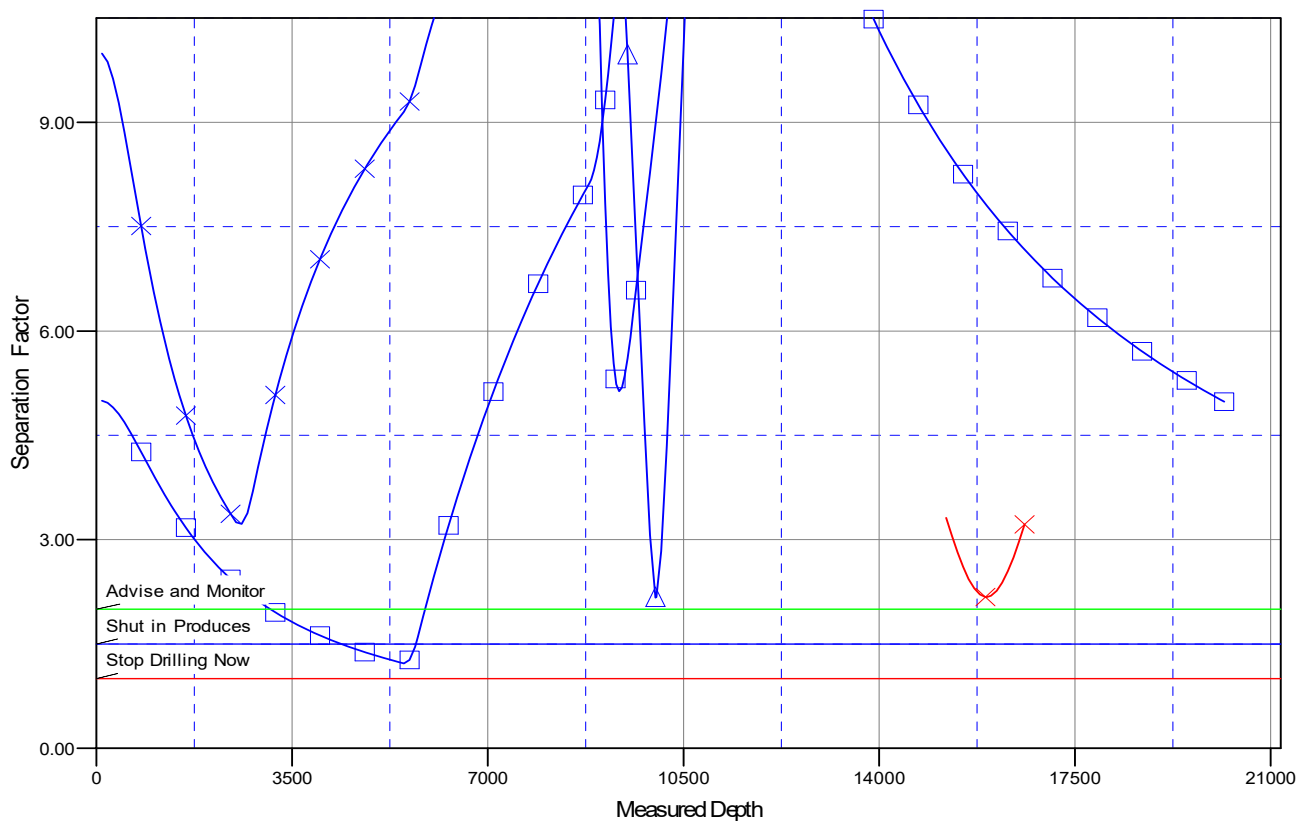
Concho Resources LLC

Anticollision Report

Company:	NORTHERN DELAWARE BASIN	Local Co-ordinate Reference:	Well TOMAHAWK FEDERAL UNIT 713H
Project:	EDDY COUNTY, NM	TVD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Reference Site:	ATLAS	MD Reference:	KB=27' @ 3069.5usft (SCAN FREE)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	TOMAHAWK FEDERAL UNIT 713H	Survey Calculation Method:	Minimum Curvature
Well Error:	3.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	OWB	Database:	edm
Reference Design:	PWP1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB=27' @ 3069.5usft (SCAN FREE) Coordinates are relative to: TOMAHAWK FEDERAL UNIT 713H
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 20' 0.000 W Grid Convergence at Surface is: 0.12°

Separation Factor Plot



LEGEND

	TOMAHAWK FEDERAL UNIT#711H, OWB, PWP1 V0		TOMAHAWK FEDERAL UNIT#712H, OWB, PWP1 V0		TOMAHAWK FEDERAL UNIT#704H, OWB, PWP1 V0
	TOMAHAWK FEDERAL UNIT#705H, OWB, PWP1 V0		TOMAHAWK FEDERAL UNIT#703H, OWB, PWP1 V0		BLACK EAGLE FED #1, OWB AWP V0

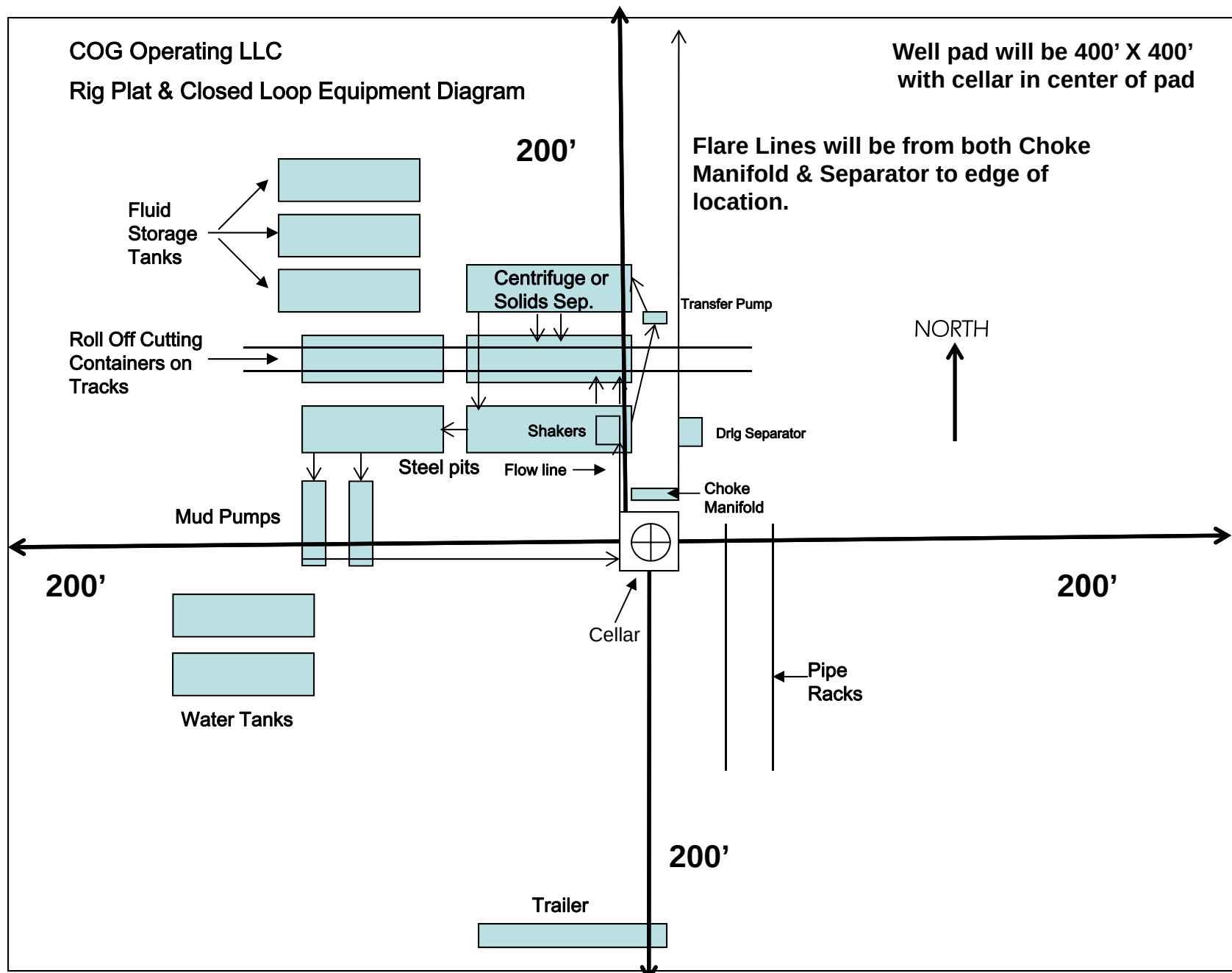


Exhibit 1

"I further certify that COG will comply with Rule 19.15.17 NMAC by using a Closed Loop System."

COG OPERATING LLC
HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

1. 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:

- a. The effects of H₂S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
- b. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
- c. The contents and requirements of the H₂S Drilling Operations Plan and the 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 the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

2. H₂S SAFETY EQUIPMENT AND SYSTEMS

Note: 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. If H₂S greater than 100 ppm is encountered in the gas stream we will shut in and install H₂S equipment.

- a. Well Control Equipment:
 - Flare line.
 - Choke manifold with remotely operated choke.
 - Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
 - Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head.

- b. Protective equipment for essential personnel:
Mark II Surviveair 30-minute units located in the dog house and at briefing areas.
- c. H2S detection and monitoring equipment:
2 - portable H2S monitor positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 ppm are reached.
- d. Visual warning systems:
Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be painted a 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. See example attached.
- e. Mud Program:
The mud program has been designed to minimize the volume of H2S circulated to the surface.
- f. Metallurgy:
All drill strings, casings, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.
- g. Communication:
Company vehicles equipped with cellular telephone.

COG OPERATING LLC has conducted a review to determine if an H2S contingency plan is required for the above referenced well. We were able to conclude that any potential hazardous volume would be minimal. H2S concentrations of wells in this area from surface to TD are low enough; therefore, we do not believe that an H2S contingency plan is necessary.

W A R N I N G

**YOU ARE ENTERING AN H₂S AREA
AUTHORIZED PERSONNEL ONLY**

- 1. BEARDS OR CONTACT LENSES NOT ALLOWED***
- 2. HARD HATS REQUIRED***
- 3. SMOKING IN DESIGNATED AREAS ONLY***
- 4. BE WIND CONSCIOUS AT ALL TIMES***
- 5. CK WITH COG OPERATING LLC FOREMAN AT MAIN OFFICE***

COG OPERATING LLC

1-575-748-6940

EMERGENCY CALL LIST

	<u>OFFICE</u>	<u>MOBILE</u>
COG OPERATING LLC OFFICE	575-748-6940	
SETH WILD	432-683-7443	432-528-3633
JOHN COFFMAN	432-685-4310	432-631-9762

EMERGENCY RESPONSE NUMBERS

	<u>OFFICE</u>
STATE POLICE	575-748-9718
EDDY COUNTY SHERIFF	575-746-2701
EMERGENCY MEDICAL SERVICES (AMBULANCE)	911 or 575-746-2701
EDDY COUNTY EMERGENCY MANAGEMENT (HARRY BURGESS)	575-887-9511
STATE EMERGENCY RESPONSE CENTER (SERC)	575-476-9620
CARLSBAD POLICE DEPARTMENT	575-885-2111
CARLSBAD FIRE DEPARTMENT	575-885-3125
NEW MEXICO OIL CONSERVATION DIVISION	575-748-1283
INDIAN FIRE & SAFETY	800-530-8693
HALLIBURTON SERVICES	800-844-8451

COG Operating LLC
H₂S Equipment Schematic
Terrain: Shinnery sand hills.

Well pad will be 400' x 400'
with cellar in center of pad

