

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED

FORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS** FEB 12 2019
Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other		5. Lease Serial No. Multiple-See Attached
2. Name of Operator DEVON ENERGY Contact: LINDA GOOD E-Mail: linda.good@dev.com		6. If Indian, Allottee or Tribe Name
3a. Address ARTESIA, 88211	3b. Phone No. (include area code) Ph: 405-552-6558	7. If Unit or CA/Agreement, Name and/or No. Multiple-See Attached
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Multiple-See Attached		8. Well Name and No. Multiple-See Attached Hussey 2734 Well Com 333H 9. API Well No. 30-013-45652 Multiple-See Attached
		10. Field and Pool or Exploratory Area COTTON DRAW PADUCA Jerning BSA West
		11. County or Parish, State EDDY COUNTY, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A PD
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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

Devon Energy Production Co., LP respectfully request permission to changed the Bottom Hole Location from 20 FSL 2310 FWL to 1300 FNL 2310 FWL.

Updated MD at TD (section 1)

Updated casing program (section 2): primary casing design changed, added variance request for TLW casing

Updated cementing program (section 3): updated volumes to reflect shorter lateral length

Attachments.

Revised BHL + Spacing
RWF

Carlsbad Field
OCD Artesia

14. I hereby certify that the foregoing is true and correct. Electronic Submission #451073 verified by the BLM Well Information System For DEVON ENERGY sent to the Carlsbad Committed to AFMSS for processing by PRISCILLA PEREZ on 01/22/2019 (19PP0743SE)	
Name (Printed/Typed) LINDA GOOD	Title REGULATORY SPECIALIST
Signature (Electronic Submission)	Date 01/18/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By JONG VO	Title PETROLEUM ENGINEER	Date 02/08/2019
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.		Office Carlsbad

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

(Instructions on page 2)

** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED **

RWF 2-14-19

[Signature]

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	DEVON ENERGY PRODUCTION COMPANY LP
LEASE NO.:	NMLC0061672A
WELL NAME & NO.:	LUSITANO 27-34 FED COM 333H
SURFACE HOLE FOOTAGE:	235'/N & 1732'/W
BOTTOM HOLE FOOTAGE:	20'/S & 2310'/W
LOCATION:	SECTION 27, T25S, R31E, NMPM
COUNTY:	EDDY

COA

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

All Previous COAs Still Apply.

A. CASING

Primary Casing Design:

1. The 10-3/4 inch surface casing shall be set at approximately **924 feet** (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that

string.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The minimum required fill of cement behind the 7-5/8 inch intermediate casing is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
 - b. Second stage above DV tool:
 - Cement to surface. If cement does not circulate, contact the appropriate BLM office.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
- ❖ 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.

Operator has proposed to pump down 10-3/4" X 7-5/8" annulus. Operator must run a CBL from TD of the 7-5/8" casing to surface. Submit results to BLM.

3. The minimum required fill of cement behind the 5-1/2 inch production casing is:

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.
Cement excess is less than 25%, more cement might be required.

Alternate Casing Design:

4. The 13-3/8 inch surface casing shall be set at approximately **924 feet** (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

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

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash. Cement excess is less than 25%, more cement might be required.**

Option 2:

Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
- b. Second stage above DV tool:
 - Cement to surface. If cement does not circulate, contact the appropriate BLM office.

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

Cement excess is less than 25%, more cement might be required.

- ❖ 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.

Operator has proposed to pump down 13-3/8" X 8-5/8" annulus. Operator must run a CBL from TD of the 8-5/8" casing to surface. Submit results to BLM.

Operator is approved for option to drill change intermediate 1 hole size to 9.875" with TLW connection.

6. The minimum required fill of cement behind the 5-1/2 inch production casing is:

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.
Cement excess is less than 25%, more cement might be required.

B. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
- 2.

Option 1:

- a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) psi**.
- b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **10,000 (10M) psi**. **Variance is approved to use a 5000 (5M) Annular which shall be tested to 5000 (5M) psi.**

Option 2:

1. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **10,000 (10M) psi. Variance is approved to use a 5000 (5M) Annular which shall be tested to 5000 (5M) psi.**
 - 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 OOGO2.III.A.2.i must be followed.

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

- a. Spudding well (minimum of 24 hours)
- b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
- c. BOPE tests (minimum of 4 hours)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

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

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)
393-3612

1. 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
 - Notify the BLM when moving in and removing the Spudder Rig.
 - 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.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. 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.

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

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.
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.
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 that portion of any 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: 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. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. 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. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
 - e. 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.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the

plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. 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.
- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- 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 results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company 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.

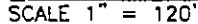
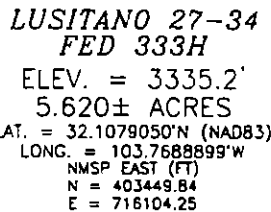
SITE MAP

A - LUSITANO 27-22 FED COM 232H
B - LUSITANO 27-34 FED 733H
C - LUSITANO 27-34 FED 622H
D - LUSITANO 27-34 FED 333H
E - LUSITANO 27-34 FED 713H

F - LUSITANO 27-34 FED COM 233H
G - LUSITANO 27-34 FED COM 533H
H - LUSITANO 27-34 FED COM 523H
I - LUSITANO 27-34 FED COM 534H

SEC. 27

-SURVEYED ELEC LINE



FROM STATE HIGHWAY 128 AND CR 1 (ORLA HIGHWAY) GO SOUTH ON CR 1 6.5 MILES TO MONSANTO ROAD, TURN RIGHT GO WEST 2.1 MILES. TURN RIGHT GO NORTH 0.8 OF A MILE. TURN LEFT GO WEST 2.1 MILES, BEND LEFT GO SOUTHWEST 1.3 MILES, TURN LEFT GO SOUTH 1.0 MILE TO BEGIN ROAD SURVEY, GO WEST 3437' (0.65 MILE), THEN SOUTH 40' TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

DECEMBER 7, 2018

SURVEY NO. 6428A

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

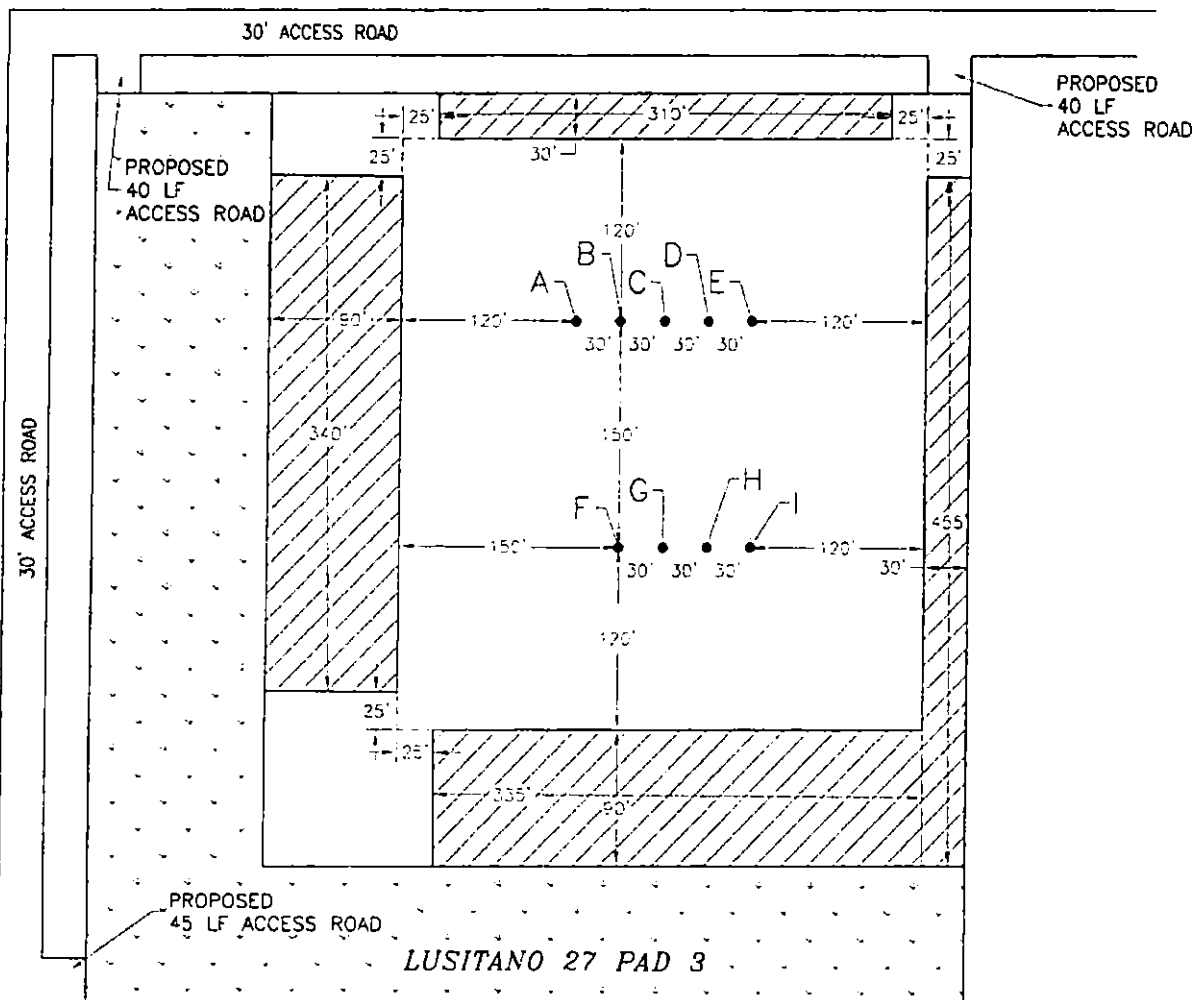
301 SOUTH CANAL
(575) 234-3341

CARLSBAD, NEW MEXICO

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
INTERIM SITE BUILD PLAN

- | | |
|---------------------------------|---------------------------------|
| A - LUSITANO 27-22 FED COM 232H | F - LUSITANO 27-34 FED COM 233H |
| B - LUSITANO 27-34 FED 733H | G - LUSITANO 27-34 FED COM 533H |
| C - LUSITANO 27-34 FED 622H | H - LUSITANO 27-34 FED COM 523H |
| D - LUSITANO 27-34 FED 333H | I - LUSITANO 27-34 FED COM 534H |
| E - LUSITANO 27-34 FED 713H | |

SEC. 22
SEC. 27



012 60 120 240
SCALE 1" = 120'

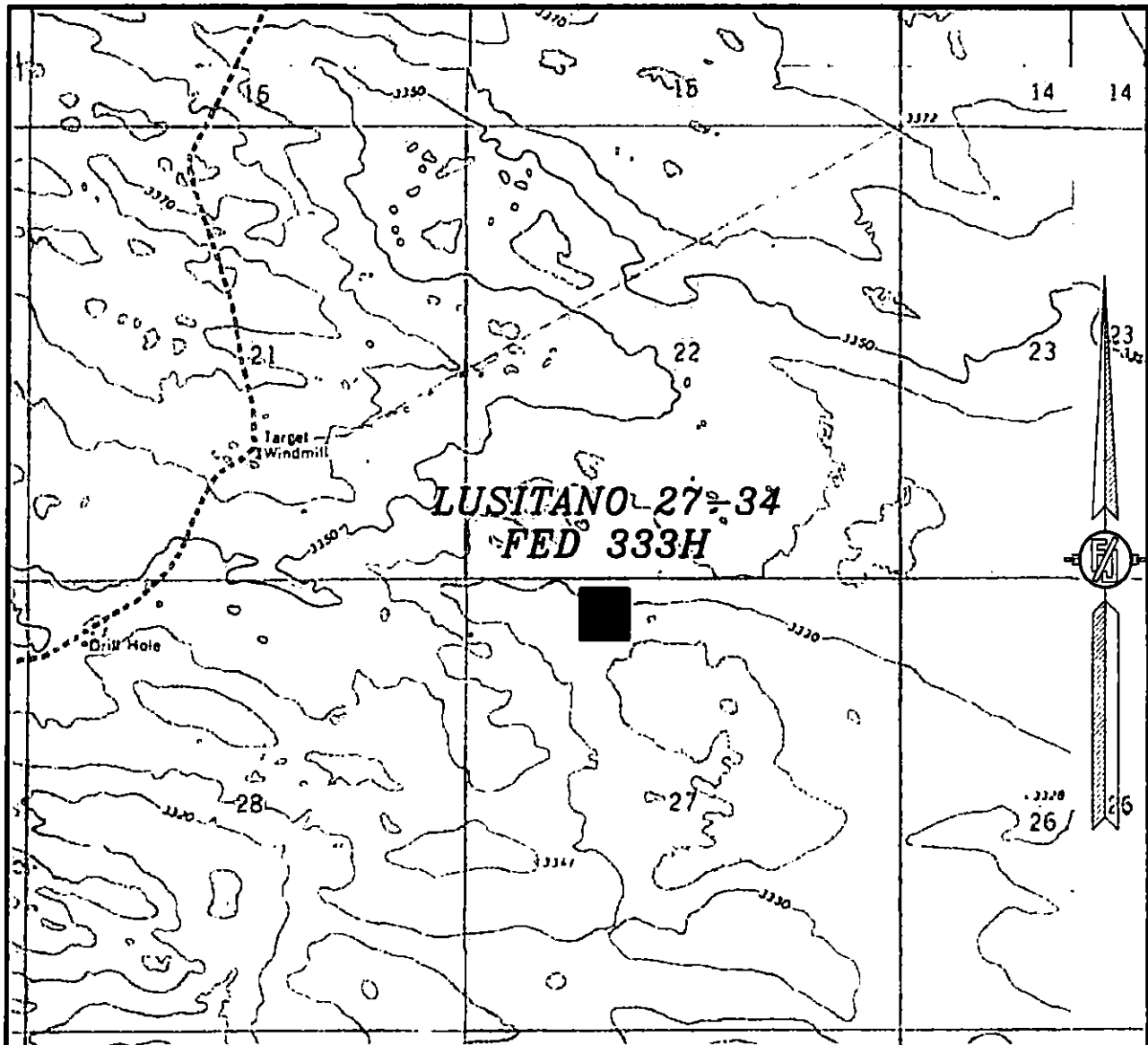
1.921± ACRES INTERIM PAD RECLAMATION AREA
2.646± ACRES GRADING SITE RECLAMATION AREA
3.699± ACRES NON-RECLAIMED AREA
8.266± ACRES LUSITANO 27 PAD 3

DEVON ENERGY PRODUCTION COMPANY, L.P.
LUSITANO 27-34 FED 333H
LOCATED 235 FT. FROM THE NORTH LINE
AND 1732 FT. FROM THE WEST LINE OF
SECTION 27, TOWNSHIP 25 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
LAND STATUS: BLM

DECEMBER 7, 2018
SURVEY NO. 6428A

MADRON SURVEYING, INC. 321 SOUTH CANAL CARLSBAD, NEW MEXICO
(505) 234-3341

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
LOCATION VERIFICATION MAP



USGS QUAD MAP:
PHANTOM BANKS

NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.

LUSITANO 27-34 FED 333H

LOCATED 235 FT. FROM THE NORTH LINE
AND 1732 FT. FROM THE WEST LINE OF
SECTION 27, TOWNSHIP 25 SOUTH,
RANGE 31 EAST, N.M.P.M.

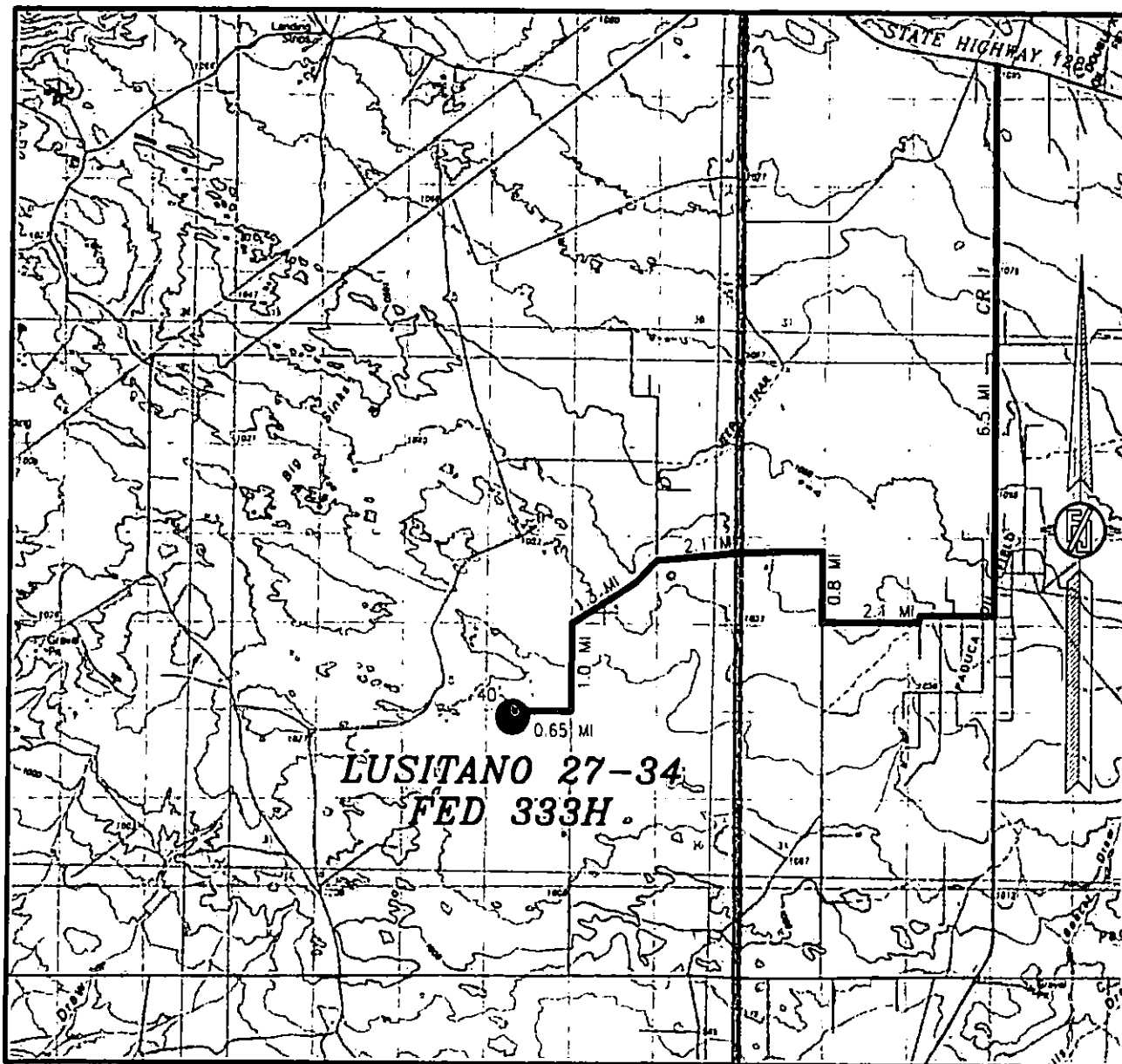
EDDY COUNTY, STATE OF NEW MEXICO
LAND STATUS: BLM

DECEMBER 7, 2018

SURVEY NO. 6428A

MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO
(575) 734-3341

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.

LUSITANO 27-34 FED 333H

LOCATED 235 FT. FROM THE NORTH LINE
AND 1732 FT. FROM THE WEST LINE OF

SECTION 27, TOWNSHIP 25 SOUTH,
RANGE 31 EAST, N.M.P.M.

EDDY COUNTY, STATE OF NEW MEXICO

LAND STATUS: BLM

DIRECTIONS TO LOCATION

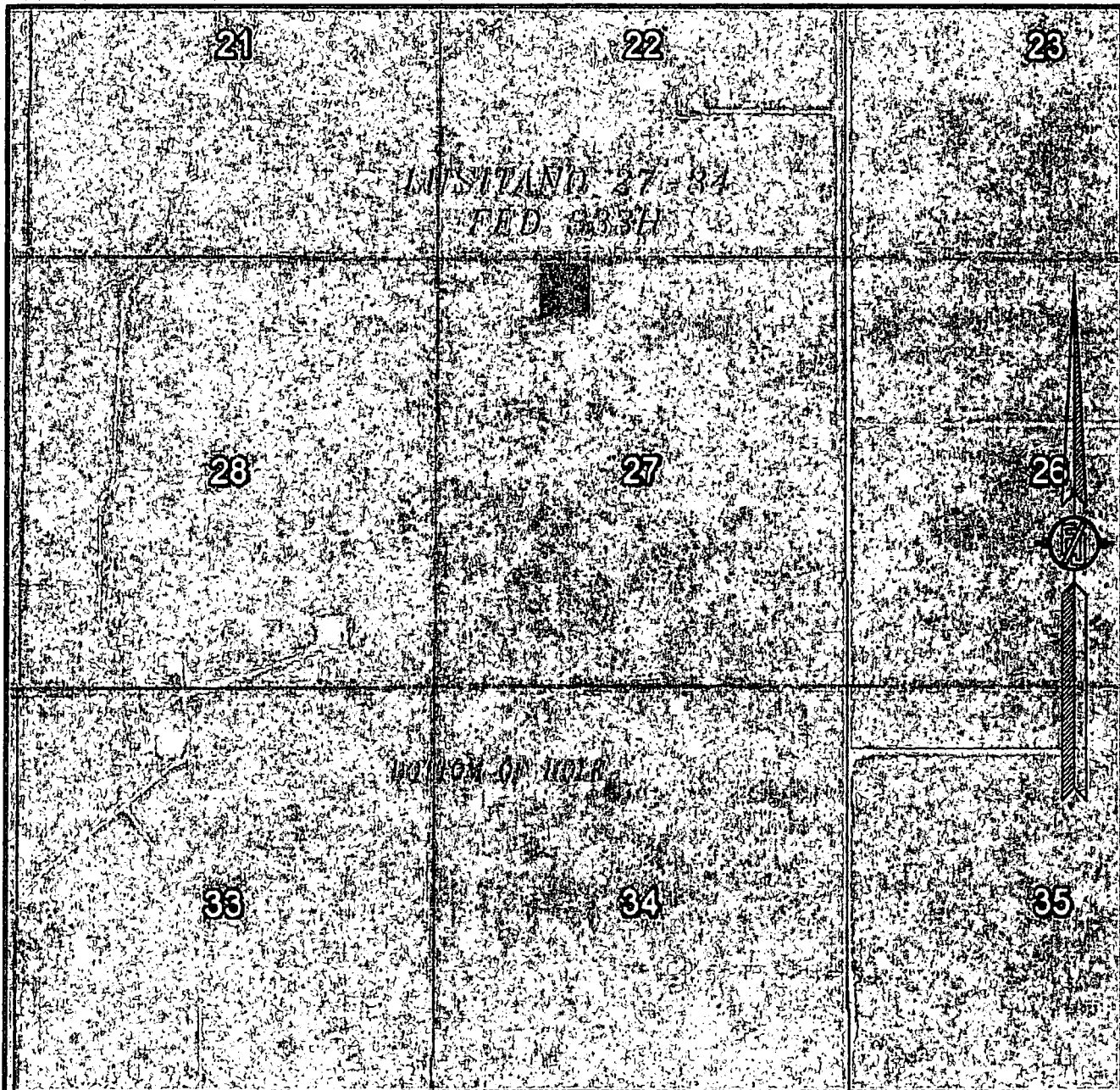
FROM STATE HIGHWAY 128 AND CR 1 (ORLA HIGHWAY) GO SOUTH ON CR 1 6.5 MILES TO MONSANTO ROAD, TURN RIGHT GO WEST 2.1 MILES, TURN RIGHT GO NORTH 0.8 OF A MILE, TURN LEFT GO WEST 2.1 MILES, BEND LEFT GO SOUTHWEST 1.3 MILES, TURN LEFT GO SOUTH 1.0 MILE TO BEGIN ROAD SURVEY, GO WEST 3437' (0.65 MILE), THEN SOUTH 40' TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

DECEMBER 7, 2018

SURVEY NO. 6428A

MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO
(575) 234-5341

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
NOVEMBER 2017

DEVON ENERGY PRODUCTION COMPANY, L.P.

LUSITANO 27-34 FED 333H

LOCATED 235 FT. FROM THE NORTH LINE
AND 1732 FT. FROM THE WEST LINE OF
SECTION 27, TOWNSHIP 25 SOUTH,
RANGE 31 EAST, N.M.P.M.

EDDY COUNTY, STATE OF NEW MEXICO

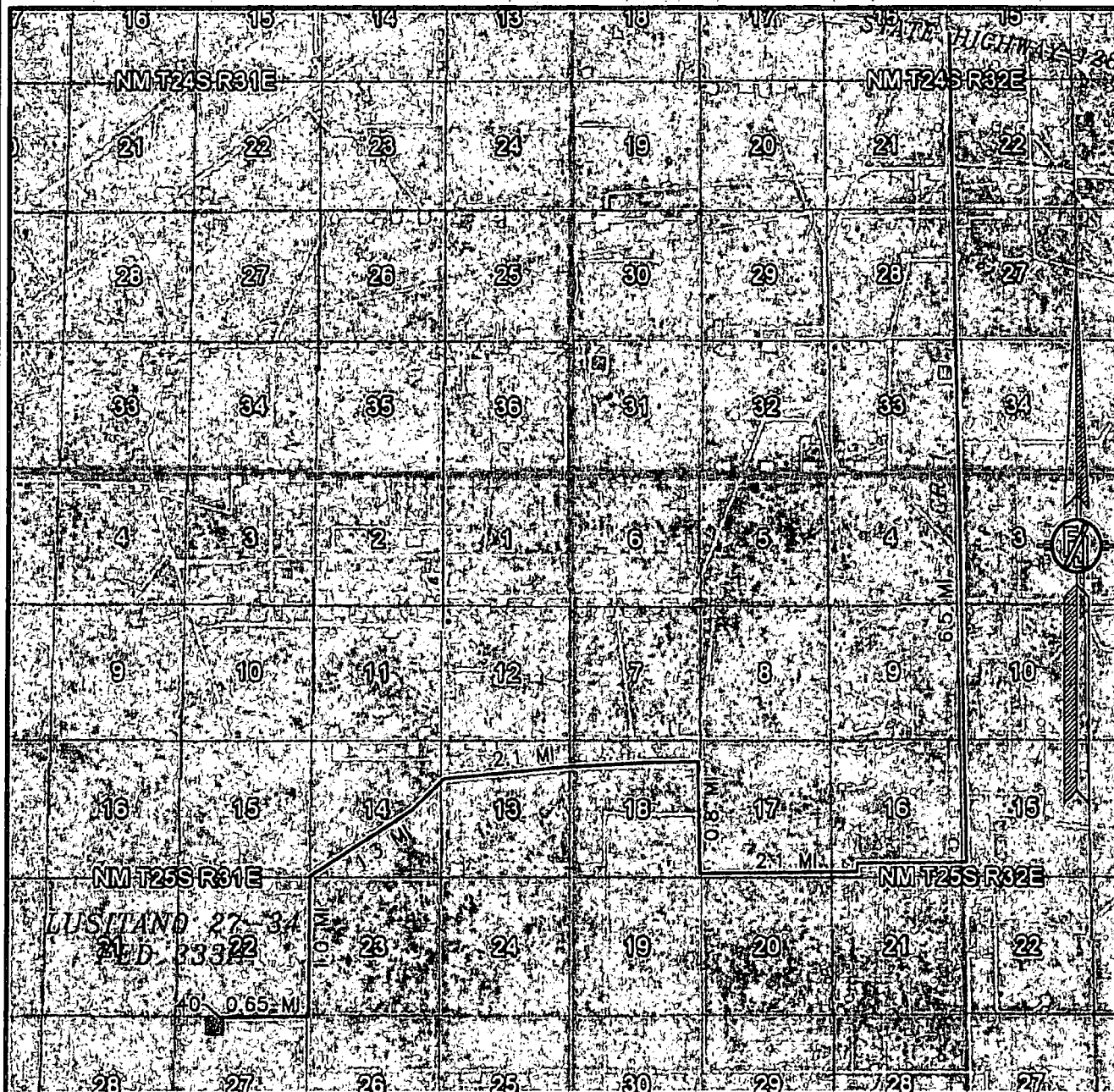
LAND STATUS: BLM

DECEMBER 7, 2018

SURVEY NO. 6428A

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

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO
 ACCESS AERIAL ROUTE MAP



NOT TO SCALE
 AERIAL PHOTO:
 GOOGLE EARTH
 NOVEMBER 2017

DEVON ENERGY PRODUCTION COMPANY, L.P.
 LUSITANO 27-34 FED 333H

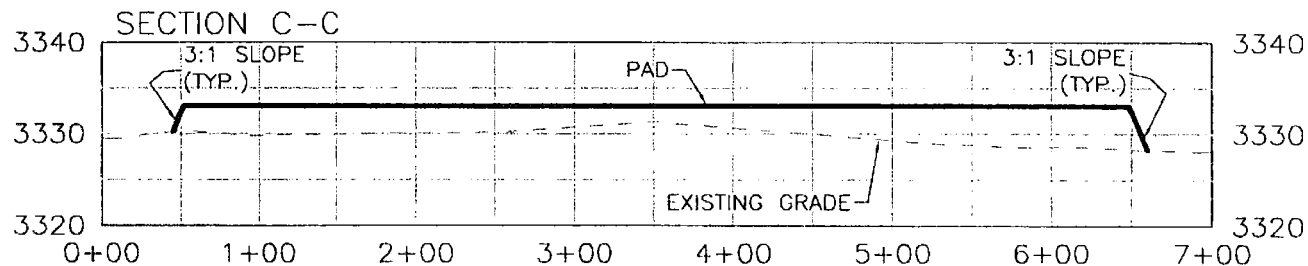
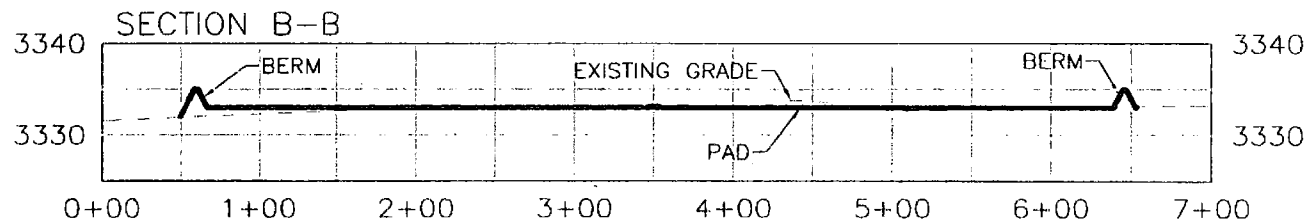
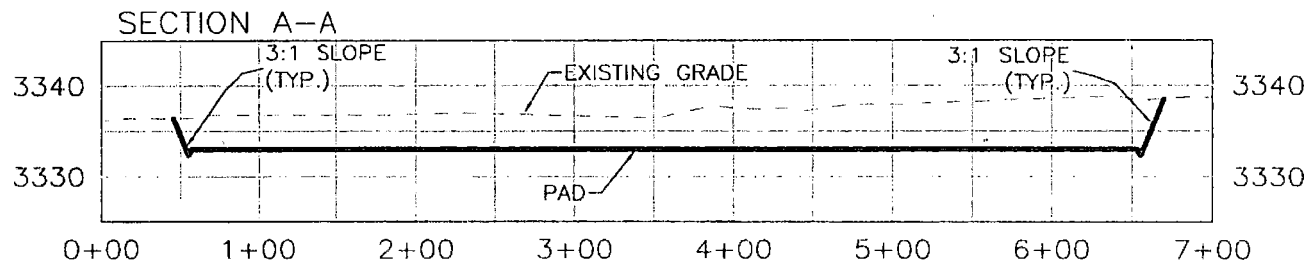
LOCATED 235 FT. FROM THE NORTH LINE
 AND 1732 FT. FROM THE WEST LINE OF
 SECTION 27, TOWNSHIP 25 SOUTH,
 RANGE 31 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO
 LAND STATUS: BLM

DECEMBER 7, 2018

SURVEY NO. 6428A

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

CROSS SECTIONS



DEVON ENERGY PRODUCTION COMPANY, L.P.
GRADING PLAN AND CROSS SECTIONS
FOR LUSITANO 27-34 FED 333H
SECTION 27, TOWNSHIP 25 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

012 60 120 240
SCALE 1" = 120' - 1" = 20' VER

CUT	FILL	NET
14475 CU. YD	14269 CU. YD	207 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

DECEMBER 7, 2018

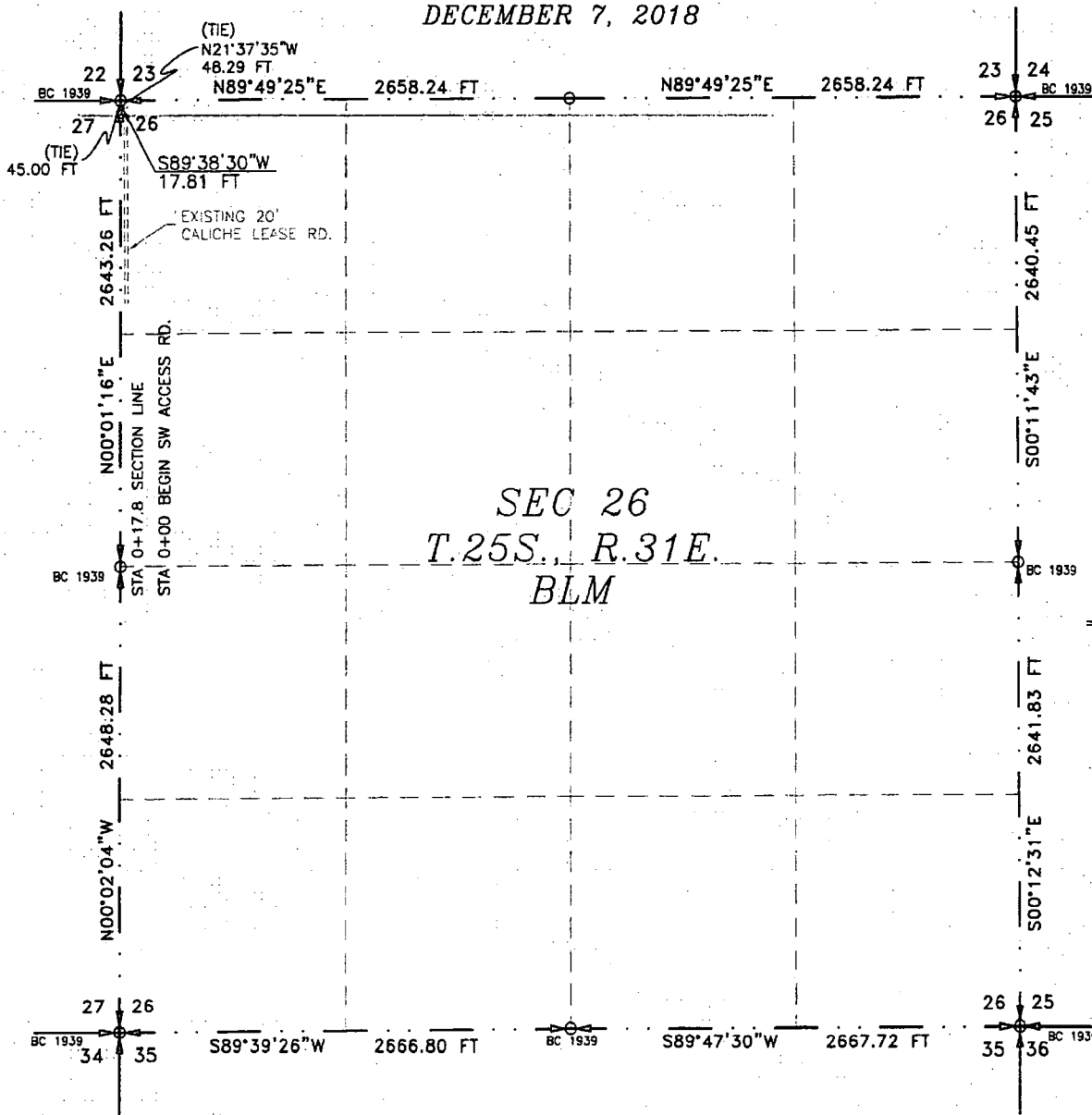
MADRON SURVEYING, INC. 361 SOUTH CANAL CARLSBAD, NEW MEXICO
(505) 234-1341

SHEET 2-2
SURVEY NO. 6428A

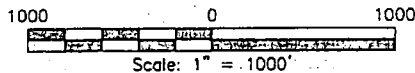
ACCESS ROAD PLAT

ACCESS ROAD TO THE LUSITANO 27 PAD 3 (LUSITANO 27-22 FED COM 232H, LUSITANO 27-34 FED COM 233H, 533H, 523H, 534H, LUSITANO 27-34 FED 713H, 333H, 622H, 733H)

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 26, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
DECEMBER 7, 2018



SEE NEXT SHEET (2-4) FOR DESCRIPTION



GENERAL NOTES

- 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.
- 2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SHEET: 1-4

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

SURVEYOR CERTIFICATE

I, FILMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 22 DAY OF DECEMBER, 2018

FILMON F. JARAMILLO
12797
301 SOUTH CANAL
(575) 234-3341

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SURVEY NO. 6428A

ACCESS ROAD PLAT

ACCESS ROAD TO THE LUSITANO 27 PAD 3 (LUSITANO 27-22 FED COM 232H, LUSITANO 27-34 FED COM 233H, 533H, 523H, 534H, LUSITANO 27-34 FED 713H, 333H, 622H, 733H)

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 26, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
DECEMBER 7, 2018

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 26, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

SOUTHWEST ACCESS ROAD

BEGINNING AT A POINT WITHIN THE NW/4 NW/4 OF SAID SECTION 26, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTHWEST CORNER OF SAID SECTION 26, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N21°37'35"W, A DISTANCE OF 48.29 FEET;

THENCE S89°38'30"W A DISTANCE OF 17.81 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTHWEST CORNER OF SAID SECTION 26, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N00°01'16"E, A DISTANCE OF 45.00 FEET;

SAID STRIP OF LAND BEING 17.81 FEET OR 1.08 RODS IN LENGTH, CONTAINING 0.012 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NW/4 NW/4 17.81 L.F. 1.08 RODS 0.012 ACRES

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SHEET: 2-4

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

SURVEYOR CERTIFICATE

I, FILMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 12TH DAY OF DECEMBER 2018

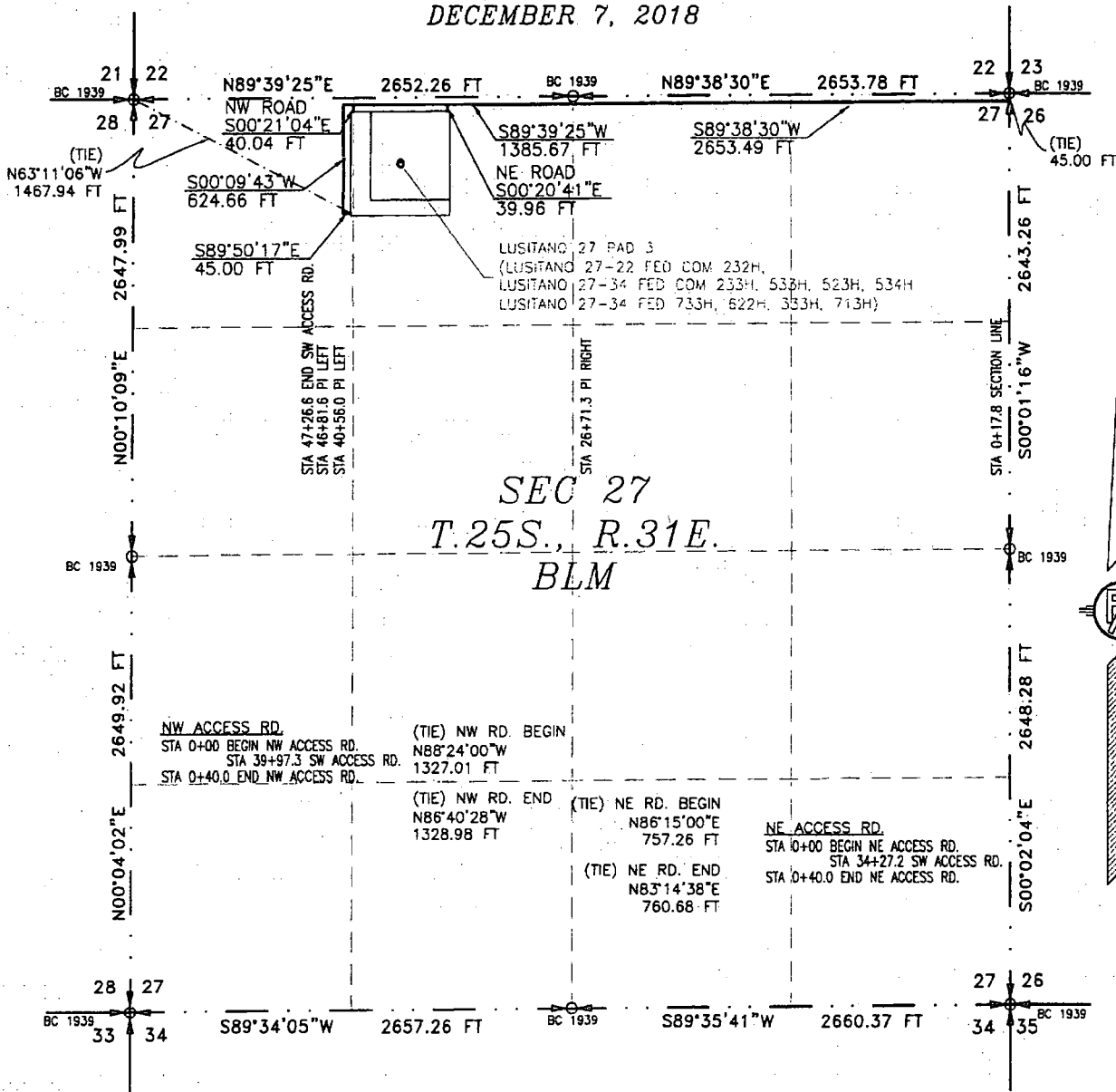
MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SURVEY NO. 6428A

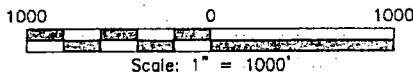
ACCESS ROAD PLAT

ACCESS ROAD TO THE LUSITANO 27 PAD 3 (LUSITANO 27-22 FED COM 232H, LUSITANO 27-34 FED COM 233H, 533H, 523H, 534H, LUSITANO 27-34 FED 713H, 333H, 622H, 733H)

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
DECEMBER 7, 2018



SEE NEXT SHEET (4-4) FOR DESCRIPTION



GENERAL NOTES

- 1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.
- 2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 7th DAY OF DECEMBER 2018

FILIMON F. JARAMILLO, PLS 12797
NEW MEXICO

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SHEET: 3-4

SURVEY NO. 6428A

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD TO THE LUSITANO 27 PAD 3 (LUSITANO 27-22, FED COM 232H, LUSITANO 27-34, FED COM 233H, 533H, 523H, 534H, LUSITANO 27-34, FED 713H, 333H, 622H, 733H)

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
DECEMBER 7, 2018

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

SOUTHWEST ACCESS ROAD

BEGINNING AT A POINT WITHIN THE NE/4 NE/4 OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTHEAST CORNER OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N00°01'16"E, A DISTANCE OF 45.00 FEET;

THENCE S89°38'30"W A DISTANCE OF 2653.49 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;

THENCE S89°39'25"W A DISTANCE OF 1385.67 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;

THENCE S00°09'43"W A DISTANCE OF 624.66 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;

THENCE S89°50'17"E A DISTANCE OF 45.00 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTHWEST CORNER OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N63°11'06"W, A DISTANCE OF 1467.94 FEET;

SAID STRIP OF LAND BEING 4708.82 FEET OR 285.38 RODS IN LENGTH, CONTAINING 3.243 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NE/4	1326.91 L.F.	80.42 RODS	0.914 ACRES
NW/4 NE/4	1326.91 L.F.	80.42 RODS	0.914 ACRES
NE/4 NW/4	1326.17 L.F.	80.37 RODS	0.913 ACRES
NW/4 NW/4	728.83 L.F.	44.17 RODS	0.502 ACRES

NORTHEAST ACCESS ROAD

BEGINNING AT A POINT WITHIN THE NE/4 NW/4 OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N86°15'00"E, A DISTANCE OF 757.26 FEET;

THENCE S00°20'41"E A DISTANCE OF 39.96 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N83°14'38"E, A DISTANCE OF 760.68 FEET;

SAID STRIP OF LAND BEING 39.96 FEET OR 2.42 RODS IN LENGTH, CONTAINING 0.028 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NW/4	39.96 L.F.	2.42 RODS	0.028 ACRES
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NORTHWEST ACCESS ROAD

BEGINNING AT A POINT WITHIN THE NE/4 NW/4 OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTHWEST CORNER OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N88°24'00"W, A DISTANCE OF 1327.01 FEET;

THENCE S00°21'04"E A DISTANCE OF 40.04 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTHWEST CORNER OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N86°40'28"W, A DISTANCE OF 1328.98 FEET;

SAID STRIP OF LAND BEING 40.04 FEET OR 2.43 RODS IN LENGTH, CONTAINING 0.028 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NE/4 NW/4	40.04 L.F.	2.43 RODS	0.028 ACRES
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SURVEYOR CERTIFICATE

I, FILMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 10 DAY OF DECEMBER 2018

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SHEET: 4-4

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

SURVEY NO. 6428A

Lusitano 27-34 Fed Com 333H

1. Geologic Formations

TVD of target	11153	Pilot hole depth	N/A
MD at TD:	17327	Deepest expected fresh water:	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Rustler	883		
Salado	1153		
Base of Salt	4238		
Delaware	4278		
L Brushy Canyon	7993		
Bone Spring	8218		
Leonard 'A'	8318		
Leonard 'B'	8723		
Leonard 'C'	8983		
1st BSPG Sand	9258		
2nd BSPG Lime	9648		
2nd BSPG Sand	9978		
L 2nd BSPG Sand	10283		
3rd BSPG Lime	10358		
3rd BSPG Sand	11153		
Wolfcamp	11643		

*H2S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program (Primary Design) - see CPA

Hole Size	Casing Interval		Csg. Size	Wt (PPF)	Grade	Conn	Min SF Collapse	Min SF Burst	Min SF Tension
	From	To							
14.75"	0	908	10.75"	40.5	J-55	STC	1.125	1.25	1.6
9.875"	0	10003 TVD	7.625"	29.7	P110	BTC	1.125	1.25	1.6
6.75"	0	TD	5.5"	20	P110	Vam SG	1.125	1.25	1.6
BLM Minimum Safety Factor							1.125	1.00	1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h Must have table for contingency casing
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
- Int casing shoe will be selected based on drilling data / gamma, setting depth with be revised accordingly if needed.
- A variance is requested to wave the centralizer requirement for the Intermediate casing and production casing.

Lusitano 27-34 Fed Com 333H

Casing Program (Alternate Design) *see CGA*

Hole Size	Casing Interval		Csg. Size	Wt. (PPF)	Grade	Conn	Min SF Collapse	Min SF Burst	Min SF Tension
	From	To							
17.5"	0	Same as above	13.375"	48	H-40	STC	1.125	1.25	1.6
10.625"	0	Same as above	8.625"	32	P110EC	BTC	1.125	1.25	1.6
7.875"	0	TD	5.5"	17	P110	BTC	1.125	1.25	1.6
BLM Minimum Safety Factor							1.125	1.00	1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h Must have table for contingency casing
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
- Int 1 casing shoe will be selected based on drilling data / gamma, setting depth with be revised accordingly if needed.
- ~~Option to drill change intermediate 1 hole size to 9.875, (8.625" connection will change from BTC to TLW)~~
- Option to run 8.625" TLW connection for intermediate 1
- A variance is requested to wave the centralizer requirement for the Intermediate casing and production casing.
- Variance is requested for collapse rating on intermediate casing. Operator will keep pipe full while running casing. No losses are expected in subsequent hole section.

	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?	

Lusitano 27-34 Fed Com 333H

Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program (Primary Design)

Casing	# Sk	TOC	Wt. (lb/gal)	Yld (ft ³ /sack)	Slurry Description
Surface	568	Surf	13.2	1.33	Lead: Class C Cement + additives
Int 1	878	Surf	9	1.85	Lead: Class C Cement + additives
	847	4000' above shoe	13.2	1.33	Tail: Class H / C + additives
Int 1 Two Stage w DV @ ~4500	440	Surf	9	1.85	1 st stage Lead: Class C Cement + additives
	55	500' above shoe	13.2	1.33	1 st stage Tail: Class H / C + additives
	460	Surf	9	1.85	2 nd stage Lead: Class C Cement + additives
	55	500' above DV	13.2	1.33	2 nd stage Tail: Class H / C + additives
Int 1 Intermediate Squeeze	As Needed	Surf	13.2	1.33	Squeeze Lead: Class C Cement + additives
	878	Surf	9	1.85	Lead: Class C Cement + additives
	847	4000' above shoe	13.2	1.33	Tail: Class H / C + additives
Production	549	500' tieback	13.2	1.33	Lead: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	50%
Intermediate 1	30%
Intermediate 1 (Two Stage)	25%
Prod	10%

Lusitano 27-34 Fed Com 333H

Cementing Program (Alternate Design)

Casing	#Sks	TOC	Wt. (lb/gal)	Yld (ft ³ /sack)	Slurry Description
Surface	752	Surf	13.2	1.33	Lead: Class C Cement + additives
Int 1	978	Surf	9	1.85	Lead: Class C Cement + additives
	831	4000' above shoe	13.2	1.33	Tail: Class H / C + additives
Int 1 Two Stage w DV @ ~4500	490	Surf	9	1.85	1 st stage Lead: Class C Cement + additives
	55	500' above shoe	13.2	1.33	1 st stage Tail: Class H / C + additives
	500	Surf	9	1.85	2 nd stage Lead: Class C Cement + additives
	55	500' above DV	13.2	1.33	2 nd stage Tail: Class H / C + additives
Int 1 Intermediate Squeeze	As Needed	Surf	13.2	1.33	Squeeze Lead: Class C Cement + additives
	978	Surf	9	1.85	Lead: Class C Cement + additives
	831	4000' above shoe	13.2	1.33	Tail: Class H / C + additives
Production	996	500' tieback	13.2	1.33	Lead: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	50%
Intermediate 1	30%
Intermediate 1 (Two Stage)	25%
Prod	10%

4. Pressure Control Equipment (Three String Design)

Pressure Control Equipment (PCE) Design					
BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
Int 1	13-5/8"	5M	Annular	X	50% of rated working pressure
			Blind Ram	X	5M
			Pipe Ram		
			Double Ram	X	
			Other*		
Production	13-5/8"	10M	Annular (5M)	X	100% of rated working pressure
			Blind Ram	X	10M
			Pipe Ram		
			Double Ram	X	
			Other*		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other*		
N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.				
Y	A variance is requested to run a 5M annular on a 10M system.				

5. Mud Program (3 String Design)

Section	Type	Weight (ppg)	Vis	Water Loss
Surface	FW Gel	8.5 - 9	28-34	N/C
Intermediate	DBE / Cut Brine	9 - 10	28-34	N/C
Production	OBM	10-10.5	28-34	N/C

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

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.	
X	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No Logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain
	Coring? If yes, explain

Additional logs planned	Interval
	Resistivity
	Density
X	CBL
X	Mud log
	PEX

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	6090 psi
Abnormal Temperature	No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

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

Is this a walking operation? Potentially

1. If operator elects, drilling rig will batch drill the surface holes and run/cement surface casing; walking the rig to next wells on the pad.
2. The drilling rig will then batch drill the intermediate sections and run/cement intermediate casing; the wellbore will be isolated with a blind flange and pressure gauge installed for monitoring the well before walking to the next well.
3. The drilling rig will then batch drill the production hole sections on the wells with OBM, run/cement production casing, and install TA caps or tubing heads for completions.

NOTE: During batch operations the drilling rig will be moved from well to well however, it will not be removed from the pad until all wells have production casing run/cemented.

Will be pre-setting casing? Potentially

1. Spudder rig will move in and drill surface hole.
 - a. Rig will utilize fresh water based mud to drill surface hole to TD. Solids control will be handled entirely on a closed loop basis.

Lusitano 27-34 Fed Com 333H

2. After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
3. The wellhead will be installed and tested once the surface casing is cut off and the WOC time has been reached.
4. A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with a pressure gauge installed on the wellhead.
5. Spudder rig operations is expected to take 4-5 days per well on a multi well pad.
6. The NMOCD will be contacted and notified 24 hours prior to commencing spudder rig operations.
7. Drilling operations will be performed with the drilling rig. At that time an approved BOP stack will be nipped up and tested on the wellhead before drilling operations commences on each well.
 - a. The NMOCD will be contacted / notified 24 hours before the drilling rig moves back on to the pad with the pre-set surface casing.

Attachments

☒ Directional Plan

☐ Other, describe

WCDSC Permian NM

Eddy County (NAD 83 NM Eastern)

Sec 27-T25S-R31E

Lusitano 27-34 Fed Com 333H

Wellbore #1

Plan: Permit Plan 2

Standard Planning Report - Geographic

17 December, 2018

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3360.20ft
Project:	Eddy County (NAD 83 NM Eastern)	MD Reference:	RKB @ 3360.20ft
Site:	Sec 27-T25S-R31E	North Reference:	Grid
Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 2		

Project	Eddy County (NAD 83 NM Eastern)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site		Sec 27-T25S-R31E				
Site Position:		Northing:	403,674.44 usft	Latitude:	32.108547	
From:	Map	Easting:	714,373.23 usft	Longitude:	-103.774477	
Position Uncertainty:		0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence:	0.30 °

Well:	Lusitano 27-34 Fed Com 333H					
Well Position	+N-S	0.00 ft	Northing:	403,449.84 usft	Latitude:	32.107905
	+E-W	0.00 ft	Easting:	716,104.25 usft	Longitude:	-103.768890
Position Uncertainty		0.50 ft	Wellhead Elevation:		Ground Level:	3,335.20 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	8/20/2018	6.91	59.91	47,728.30603141

Design:	Permit Plan 2			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section	Depth From (TVD)	+N-S	+E-W	Direction
	(ft)	(ft)	(ft)	(°)
	0.00	0.00	0.00	174.84

Plan Survey Tool Program			Date: 12/17/2018	
Depth From	Depth To	Survey (Wellbore)	Tool Name	Remarks
(ft)	(ft)			
1	0.00	17,327.72 Permit Plan 2 (Wellbore #1)	MWD+HDGM	
			OWSG MWD + HDGM	

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N-S	+E-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(ft)	(ft)	Rate	Rate	Rate	(°)	
(ft)			(ft)			(%/100usft)	(%/100usft)	(%/100usft)		
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,135.42	6.35	86.53	5,134.12	2.13	35.13	1.00	1.00	0.00	86.53	
9,837.44	6.35	86.53	9,807.25	33.58	554.58	0.00	0.00	0.00	0.00	
10,261.06	0.00	0.00	10,230.00	35.00	578.00	1.50	-1.50	0.00	180.00	
10,611.10	0.00	0.00	10,580.04	35.00	578.00	0.00	0.00	0.00	0.00	
11,511.10	90.00	180.04	11,153.00	-537.96	577.63	10.00	10.00	0.00	180.04	PBHL - Lusitano 27_3
17,327.72	90.00	180.04	11,153.00	-6,354.58	573.87	0.00	0.00	0.00	0.00	PBHL - Lusitano 27_3

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3360.20ft
Project:	Eddy County (NAD 83 NM Eastern)	MD Reference:	RKB @ 3360.20ft
Site:	Sec 27-T25S-R31E	North Reference:	Grid
Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 2		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
100.00	0.00	0.00	100.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
200.00	0.00	0.00	200.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
300.00	0.00	0.00	300.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
400.00	0.00	0.00	400.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
500.00	0.00	0.00	500.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
600.00	0.00	0.00	600.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
700.00	0.00	0.00	700.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
800.00	0.00	0.00	800.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
900.00	0.00	0.00	900.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
1,000.00	0.00	0.00	1,000.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
1,100.00	0.00	0.00	1,100.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
1,200.00	0.00	0.00	1,200.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
1,300.00	0.00	0.00	1,300.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
1,400.00	0.00	0.00	1,400.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
1,500.00	0.00	0.00	1,500.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
1,600.00	0.00	0.00	1,600.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
1,700.00	0.00	0.00	1,700.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
1,800.00	0.00	0.00	1,800.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
1,900.00	0.00	0.00	1,900.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
2,000.00	0.00	0.00	2,000.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
2,100.00	0.00	0.00	2,100.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
2,200.00	0.00	0.00	2,200.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
2,300.00	0.00	0.00	2,300.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
2,400.00	0.00	0.00	2,400.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
2,500.00	0.00	0.00	2,500.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
2,600.00	0.00	0.00	2,600.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
2,700.00	0.00	0.00	2,700.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
2,800.00	0.00	0.00	2,800.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
2,900.00	0.00	0.00	2,900.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
3,000.00	0.00	0.00	3,000.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
3,100.00	0.00	0.00	3,100.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
3,200.00	0.00	0.00	3,200.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
3,300.00	0.00	0.00	3,300.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
3,400.00	0.00	0.00	3,400.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
3,500.00	0.00	0.00	3,500.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
3,600.00	0.00	0.00	3,600.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
3,700.00	0.00	0.00	3,700.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
3,800.00	0.00	0.00	3,800.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
3,900.00	0.00	0.00	3,900.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
4,000.00	0.00	0.00	4,000.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
4,100.00	0.00	0.00	4,100.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
4,200.00	0.00	0.00	4,200.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
4,300.00	0.00	0.00	4,300.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
4,400.00	0.00	0.00	4,400.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
4,500.00	0.00	0.00	4,500.00	0.00	0.00	403,449.84	716,104.25	32.107905	-103.768890
4,600.00	1.00	86.53	4,600.00	0.05	0.87	403,449.89	716,105.12	32.107905	-103.768887
4,700.00	2.00	86.53	4,699.96	0.21	3.48	403,450.05	716,107.73	32.107906	-103.768879
4,800.00	3.00	86.53	4,799.86	0.47	7.84	403,450.31	716,112.08	32.107906	-103.768865
4,900.00	4.00	86.53	4,899.68	0.84	13.93	403,450.68	716,118.18	32.107907	-103.768845
5,000.00	5.00	86.53	4,999.37	1.32	21.76	403,451.16	716,126.01	32.107908	-103.768820
5,100.00	6.00	86.53	5,098.90	1.90	31.33	403,451.74	716,135.58	32.107910	-103.768789
5,135.42	6.35	86.53	5,134.12	2.13	35.13	403,451.97	716,139.38	32.107910	-103.768777
5,200.00	6.35	86.53	5,198.30	2.56	42.27	403,452.40	716,146.51	32.107912	-103.768754
5,300.00	6.35	86.53	5,297.69	3.23	53.32	403,453.07	716,157.56	32.107913	-103.768718

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3360.20ft
Project:	Eddy County (NAD 83 NM Eastern)	MD Reference:	RKB @ 3360.20ft
Site:	Sec 27-T25S-R31E	North Reference:	Grid
Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 2		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
5,400.00	6.35	86.53	5,397.07	3.90	64.36	403,453.74	716,168.61	32.107915	-103.768682	
5,500.00	6.35	86.53	5,496.46	4.57	75.41	403,454.41	716,179.66	32.107917	-103.768647	
5,600.00	6.35	86.53	5,595.84	5.24	86.46	403,455.07	716,190.70	32.107918	-103.768611	
5,700.00	6.35	86.53	5,695.23	5.90	97.50	403,455.74	716,201.75	32.107920	-103.768575	
5,800.00	6.35	86.53	5,794.62	6.57	108.55	403,456.41	716,212.80	32.107922	-103.768539	
5,900.00	6.35	86.53	5,894.00	7.24	119.60	403,457.08	716,223.84	32.107923	-103.768504	
6,000.00	6.35	86.53	5,993.39	7.91	130.65	403,457.75	716,234.89	32.107925	-103.768468	
6,100.00	6.35	86.53	6,092.77	8.58	141.69	403,458.42	716,245.94	32.107927	-103.768432	
6,200.00	6.35	86.53	6,192.16	9.25	152.74	403,459.09	716,256.99	32.107928	-103.768397	
6,300.00	6.35	86.53	6,291.54	9.92	163.79	403,459.76	716,268.03	32.107930	-103.768361	
6,400.00	6.35	86.53	6,390.93	10.59	174.84	403,460.43	716,279.08	32.107932	-103.768325	
6,500.00	6.35	86.53	6,490.32	11.26	185.88	403,461.09	716,290.13	32.107933	-103.768290	
6,600.00	6.35	86.53	6,589.70	11.92	196.93	403,461.76	716,301.18	32.107935	-103.768254	
6,700.00	6.35	86.53	6,689.09	12.59	207.98	403,462.43	716,312.22	32.107937	-103.768218	
6,800.00	6.35	86.53	6,788.47	13.26	219.02	403,463.10	716,323.27	32.107938	-103.768183	
6,900.00	6.35	86.53	6,887.86	13.93	230.07	403,463.77	716,334.32	32.107940	-103.768147	
7,000.00	6.35	86.53	6,987.24	14.60	241.12	403,464.44	716,345.36	32.107942	-103.768111	
7,100.00	6.35	86.53	7,086.63	15.27	252.17	403,465.11	716,356.41	32.107943	-103.768075	
7,200.00	6.35	86.53	7,186.02	15.94	263.21	403,465.78	716,367.46	32.107945	-103.768040	
7,300.00	6.35	86.53	7,285.40	16.61	274.26	403,466.45	716,378.51	32.107947	-103.768004	
7,400.00	6.35	86.53	7,384.79	17.28	285.31	403,467.12	716,389.55	32.107949	-103.767968	
7,500.00	6.35	86.53	7,484.17	17.95	296.35	403,467.78	716,400.60	32.107950	-103.767933	
7,600.00	6.35	86.53	7,583.56	18.61	307.40	403,468.45	716,411.65	32.107952	-103.767897	
7,700.00	6.35	86.53	7,682.94	19.28	318.45	403,469.12	716,422.69	32.107954	-103.767861	
7,800.00	6.35	86.53	7,782.33	19.95	329.50	403,469.79	716,433.74	32.107955	-103.767826	
7,900.00	6.35	86.53	7,881.71	20.62	340.54	403,470.46	716,444.79	32.107957	-103.767790	
8,000.00	6.35	86.53	7,981.10	21.29	351.59	403,471.13	716,455.84	32.107959	-103.767754	
8,100.00	6.35	86.53	8,080.49	21.96	362.64	403,471.80	716,466.88	32.107960	-103.767719	
8,200.00	6.35	86.53	8,179.87	22.63	373.69	403,472.47	716,477.93	32.107962	-103.767683	
8,300.00	6.35	86.53	8,279.26	23.30	384.73	403,473.14	716,488.98	32.107964	-103.767647	
8,400.00	6.35	86.53	8,378.64	23.97	395.78	403,473.80	716,500.02	32.107965	-103.767612	
8,500.00	6.35	86.53	8,478.03	24.63	406.83	403,474.47	716,511.07	32.107967	-103.767576	
8,600.00	6.35	86.53	8,577.41	25.30	417.87	403,475.14	716,522.12	32.107969	-103.767540	
8,700.00	6.35	86.53	8,676.80	25.97	428.92	403,475.81	716,533.17	32.107970	-103.767504	
8,800.00	6.35	86.53	8,776.19	26.64	439.97	403,476.48	716,544.21	32.107972	-103.767469	
8,900.00	6.35	86.53	8,875.57	27.31	451.02	403,477.15	716,555.26	32.107974	-103.767433	
9,000.00	6.35	86.53	8,974.96	27.98	462.06	403,477.82	716,566.31	32.107975	-103.767397	
9,100.00	6.35	86.53	9,074.34	28.65	473.11	403,478.49	716,577.36	32.107977	-103.767362	
9,200.00	6.35	86.53	9,173.73	29.32	484.16	403,479.16	716,588.40	32.107979	-103.767326	
9,300.00	6.35	86.53	9,273.11	29.99	495.20	403,479.83	716,599.45	32.107980	-103.767290	
9,400.00	6.35	86.53	9,372.50	30.66	506.25	403,480.49	716,610.50	32.107982	-103.767255	
9,500.00	6.35	86.53	9,471.89	31.32	517.30	403,481.16	716,621.54	32.107984	-103.767219	
9,600.00	6.35	86.53	9,571.27	31.99	528.35	403,481.83	716,632.59	32.107985	-103.767183	
9,700.00	6.35	86.53	9,670.66	32.66	539.39	403,482.50	716,643.64	32.107987	-103.767148	
9,800.00	6.35	86.53	9,770.04	33.33	550.44	403,483.17	716,654.69	32.107989	-103.767112	
9,837.44	6.35	86.53	9,807.25	33.58	554.58	403,483.42	716,658.82	32.107989	-103.767099	
9,900.00	5.42	86.53	9,869.48	33.97	560.98	403,483.81	716,665.22	32.107990	-103.767078	
10,000.00	3.92	86.53	9,969.15	34.46	569.10	403,484.30	716,673.34	32.107992	-103.767052	
10,100.00	2.42	86.53	10,068.99	34.79	574.61	403,484.63	716,678.86	32.107992	-103.767034	
10,200.00	0.92	86.53	10,168.95	34.97	577.51	403,484.81	716,681.76	32.107993	-103.767024	
10,261.06	0.00	0.00	10,230.00	35.00	578.00	403,484.84	716,682.24	32.107993	-103.767023	
10,300.00	0.00	0.00	10,268.94	35.00	578.00	403,484.84	716,682.24	32.107993	-103.767023	
10,400.00	0.00	0.00	10,368.94	35.00	578.00	403,484.84	716,682.24	32.107993	-103.767023	
10,500.00	0.00	0.00	10,468.94	35.00	578.00	403,484.84	716,682.24	32.107993	-103.767023	
10,600.00	0.00	0.00	10,568.94	35.00	578.00	403,484.84	716,682.24	32.107993	-103.767023	

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3360.20ft
Project:	Eddy County (NAD 83 NM Eastern)	MD Reference:	RKB @ 3360.20ft
Site:	Sec 27-T25S-R31E	North Reference:	Grid
Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 2		

Planned Survey										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude	
10,611.10	0.00	0.00	10,580.04	35.00	578.00	403,484.84	716,682.24	32.107993	-103.767023	
KOP & FTP @ 10611' MD, 200' FNL, 2310' FWL										
10,700.00	8.89	180.04	10,668.59	28.12	578.00	403,477.96	716,682.24	32.107974	-103.767023	
10,800.00	18.89	180.04	10,765.54	4.14	577.98	403,453.98	716,682.22	32.107908	-103.767023	
10,900.00	28.89	180.04	10,856.86	-36.31	577.95	403,413.53	716,682.20	32.107797	-103.767024	
11,000.00	38.89	180.04	10,939.76	-92.00	577.92	403,357.84	716,682.16	32.107644	-103.767025	
11,100.00	48.89	180.04	11,011.74	-161.24	577.87	403,288.60	716,682.12	32.107454	-103.767027	
11,200.00	58.89	180.04	11,070.60	-241.92	577.82	403,207.92	716,682.07	32.107232	-103.767028	
11,300.00	68.89	180.04	11,114.55	-331.61	577.76	403,118.23	716,682.01	32.106985	-103.767030	
11,400.00	78.89	180.04	11,142.26	-427.56	577.70	403,022.28	716,681.95	32.106722	-103.767032	
11,500.00	88.89	180.04	11,152.89	-526.86	577.64	402,922.98	716,681.88	32.106449	-103.767034	
11,511.10	90.00	180.04	11,153.00	-537.96	577.63	402,911.88	716,681.87	32.106418	-103.767034	
11,600.00	90.00	180.04	11,153.00	-626.86	577.57	402,822.98	716,681.82	32.106174	-103.767035	
11,700.00	90.00	180.04	11,153.00	-726.86	577.51	402,722.98	716,681.75	32.105899	-103.767037	
11,800.00	90.00	180.04	11,153.00	-826.86	577.44	402,622.98	716,681.69	32.105624	-103.767039	
11,900.00	90.00	180.04	11,153.00	-926.86	577.38	402,522.98	716,681.62	32.105349	-103.767041	
12,000.00	90.00	180.04	11,153.00	-1,026.86	577.31	402,422.98	716,681.56	32.105074	-103.767043	
12,100.00	90.00	180.04	11,153.00	-1,126.86	577.25	402,322.98	716,681.49	32.104799	-103.767045	
12,200.00	90.00	180.04	11,153.00	-1,226.86	577.18	402,222.98	716,681.43	32.104524	-103.767047	
12,300.00	90.00	180.04	11,153.00	-1,326.86	577.12	402,122.98	716,681.36	32.104250	-103.767049	
12,400.00	90.00	180.04	11,153.00	-1,426.86	577.06	402,022.98	716,681.30	32.103975	-103.767051	
12,500.00	90.00	180.04	11,153.00	-1,526.86	576.99	401,922.98	716,681.24	32.103700	-103.767053	
12,600.00	90.00	180.04	11,153.00	-1,626.86	576.93	401,822.98	716,681.17	32.103425	-103.767055	
12,700.00	90.00	180.04	11,153.00	-1,726.86	576.86	401,722.98	716,681.11	32.103150	-103.767056	
12,800.00	90.00	180.04	11,153.00	-1,826.86	576.80	401,622.98	716,681.04	32.102875	-103.767058	
12,900.00	90.00	180.04	11,153.00	-1,926.86	576.73	401,522.98	716,680.98	32.102600	-103.767060	
13,000.00	90.00	180.04	11,153.00	-2,026.86	576.67	401,422.98	716,680.91	32.102325	-103.767062	
13,100.00	90.00	180.04	11,153.00	-2,126.86	576.60	401,322.98	716,680.85	32.102050	-103.767064	
13,200.00	90.00	180.04	11,153.00	-2,226.86	576.54	401,222.98	716,680.78	32.101776	-103.767066	
13,300.00	90.00	180.04	11,153.00	-2,326.86	576.47	401,122.98	716,680.72	32.101501	-103.767068	
13,400.00	90.00	180.04	11,153.00	-2,426.86	576.41	401,022.98	716,680.65	32.101226	-103.767070	
13,500.00	90.00	180.04	11,153.00	-2,526.86	576.34	400,922.98	716,680.59	32.100951	-103.767072	
13,600.00	90.00	180.04	11,153.00	-2,626.86	576.28	400,822.98	716,680.52	32.100676	-103.767074	
13,700.00	90.00	180.04	11,153.00	-2,726.86	576.22	400,722.98	716,680.46	32.100401	-103.767075	
13,800.00	90.00	180.04	11,153.00	-2,826.86	576.15	400,622.98	716,680.40	32.100126	-103.767077	
13,900.00	90.00	180.04	11,153.00	-2,926.86	576.09	400,522.98	716,680.33	32.099851	-103.767079	
14,000.00	90.00	180.04	11,153.00	-3,026.86	576.02	400,422.98	716,680.27	32.099577	-103.767081	
14,100.00	90.00	180.04	11,153.00	-3,126.86	575.96	400,322.98	716,680.20	32.099302	-103.767083	
14,200.00	90.00	180.04	11,153.00	-3,226.86	575.89	400,222.98	716,680.14	32.099027	-103.767085	
14,300.00	90.00	180.04	11,153.00	-3,326.86	575.83	400,122.98	716,680.07	32.098752	-103.767087	
14,400.00	90.00	180.04	11,153.00	-3,426.86	575.76	400,022.98	716,680.01	32.098477	-103.767089	
14,500.00	90.00	180.04	11,153.00	-3,526.86	575.70	399,922.99	716,679.94	32.098202	-103.767091	
14,600.00	90.00	180.04	11,153.00	-3,626.86	575.63	399,822.99	716,679.88	32.097927	-103.767093	
14,700.00	90.00	180.04	11,153.00	-3,726.86	575.57	399,722.99	716,679.81	32.097652	-103.767095	
14,800.00	90.00	180.04	11,153.00	-3,826.86	575.50	399,622.99	716,679.75	32.097377	-103.767096	
14,900.00	90.00	180.04	11,153.00	-3,926.86	575.44	399,522.99	716,679.68	32.097103	-103.767098	
15,000.00	90.00	180.04	11,153.00	-4,026.86	575.38	399,422.99	716,679.62	32.096828	-103.767100	
15,100.00	90.00	180.04	11,153.00	-4,126.86	575.31	399,322.99	716,679.56	32.096553	-103.767102	
15,200.00	90.00	180.04	11,153.00	-4,226.86	575.25	399,222.99	716,679.49	32.096278	-103.767104	
15,300.00	90.00	180.04	11,153.00	-4,326.86	575.18	399,122.99	716,679.43	32.096003	-103.767106	
15,400.00	90.00	180.04	11,153.00	-4,426.86	575.12	399,022.99	716,679.36	32.095728	-103.767108	
15,500.00	90.00	180.04	11,153.00	-4,526.86	575.05	398,922.99	716,679.30	32.095453	-103.767110	
15,600.00	90.00	180.04	11,153.00	-4,626.86	574.99	398,822.99	716,679.23	32.095178	-103.767112	
15,700.00	90.00	180.04	11,153.00	-4,726.86	574.92	398,722.99	716,679.17	32.094904	-103.767114	

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3360.20ft
Project:	Eddy County (NAD 83 NM Eastern)	MD Reference:	RKB @ 3360.20ft
Site:	Sec 27-T25S-R31E	North Reference:	Grid
Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 2		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,800.00	90.00	180.04	11,153.00	-4,826.86	574.86	398,622.99	716,679.10	32.094629	-103.767115
15,900.00	90.00	180.04	11,153.00	-4,926.86	574.79	398,522.99	716,679.04	32.094354	-103.767117
16,000.00	90.00	180.04	11,153.00	-5,026.86	574.73	398,422.99	716,678.97	32.094079	-103.767119
16,018.00	90.00	180.04	11,153.00	-5,044.86	574.72	398,404.99	716,678.96	32.094029	-103.767120
Cross Section @ 16018' MD, 0' FNL, 2310' FWL									
16,100.00	90.00	180.04	11,153.00	-5,126.86	574.66	398,322.99	716,678.91	32.093804	-103.767121
16,200.00	90.00	180.04	11,153.00	-5,226.86	574.60	398,222.99	716,678.84	32.093529	-103.767123
16,300.00	90.00	180.04	11,153.00	-5,326.86	574.54	398,122.99	716,678.78	32.093254	-103.767125
16,400.00	90.00	180.04	11,153.00	-5,426.86	574.47	398,022.99	716,678.72	32.092979	-103.767127
16,500.00	90.00	180.04	11,153.00	-5,526.86	574.41	397,922.99	716,678.65	32.092705	-103.767129
16,600.00	90.00	180.04	11,153.00	-5,626.86	574.34	397,822.99	716,678.59	32.092430	-103.767131
16,700.00	90.00	180.04	11,153.00	-5,726.86	574.28	397,722.99	716,678.52	32.092155	-103.767133
16,800.00	90.00	180.04	11,153.00	-5,826.86	574.21	397,622.99	716,678.46	32.091880	-103.767135
16,900.00	90.00	180.04	11,153.00	-5,926.86	574.15	397,522.99	716,678.39	32.091605	-103.767136
17,000.00	90.00	180.04	11,153.00	-6,026.86	574.08	397,422.99	716,678.33	32.091330	-103.767138
17,100.00	90.00	180.04	11,153.00	-6,126.86	574.02	397,322.99	716,678.26	32.091055	-103.767140
17,200.00	90.00	180.04	11,153.00	-6,226.86	573.95	397,222.99	716,678.20	32.090780	-103.767142
17,247.72	90.00	180.04	11,153.00	-6,274.58	573.92	397,175.27	716,678.17	32.090649	-103.767143
LTP @ 17248' MD, 1220' FNL, 2310' FWL									
17,300.00	90.00	180.04	11,153.00	-6,326.86	573.89	397,122.99	716,678.13	32.090505	-103.767144
17,327.71	90.00	180.04	11,153.00	-6,354.57	573.87	397,095.28	716,678.12	32.090429	-103.767145
PBHL; 1300' FNL, 2310' FWL									
17,327.71	90.00	180.04	11,153.00	-6,354.58	573.87	397,095.27	716,678.12	32.090429	-103.767145

Design Targets									
Target Name	Dip Angle (°)	Dip Dir (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
hit/miss target									
Shape									
PBHL - Lusitano 27_34 I	0.00	0.00	0.00	-6,354.58	573.87	397,095.27	716,678.12	32.090429	-103.767145
- plan misses target center by 6380.44ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									

Plan Annotations					
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment	
		+N/-S (ft)	+E/-W (ft)		
10,611.10	10,580.04	35.00	578.00	KOP & FTP @ 10611' MD, 200' FNL, 2310' FWL	
16,018.00	11,153.00	-5,044.86	574.72	Cross Section @ 16018' MD, 0' FNL, 2310' FWL	
17,247.72	11,153.00	-6,274.58	573.92	LTP @ 17248' MD, 1220' FNL, 2310' FWL	
17,327.71	11,153.00	-6,354.57	573.87	PBHL; 1300' FNL, 2310' FWL	

WCDSC Permian NM
Lusitano 27-34 Fed Com 333H - Permit Plan 2

Eddy County (NAD 83 NM Eastern)
Sec 27-T25S-R31E
Your Ref:

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0	0	0	0	0	0	0	0
100	0	0	100	0	0	0	0
200	0	0	200	0	0	0	0
300	0	0	300	0	0	0	0
400	0	0	400	0	0	0	0
500	0	0	500	0	0	0	0
600	0	0	600	0	0	0	0
700	0	0	700	0	0	0	0
800	0	0	800	0	0	0	0
900	0	0	900	0	0	0	0
1000	0	0	1000	0	0	0	0
1100	0	0	1100	0	0	0	0
1200	0	0	1200	0	0	0	0
1300	0	0	1300	0	0	0	0
1400	0	0	1400	0	0	0	0
1500	0	0	1500	0	0	0	0
1600	0	0	1600	0	0	0	0
1700	0	0	1700	0	0	0	0
1800	0	0	1800	0	0	0	0
1900	0	0	1900	0	0	0	0
2000	0	0	2000	0	0	0	0
2100	0	0	2100	0	0	0	0
2200	0	0	2200	0	0	0	0
2300	0	0	2300	0	0	0	0
2400	0	0	2400	0	0	0	0
2500	0	0	2500	0	0	0	0
2600	0	0	2600	0	0	0	0
2700	0	0	2700	0	0	0	0
2800	0	0	2800	0	0	0	0
2900	0	0	2900	0	0	0	0
3000	0	0	3000	0	0	0	0
3100	0	0	3100	0	0	0	0

3200	0	0	3200	0	0	0	0
3300	0	0	3300	0	0	0	0
3400	0	0	3400	0	0	0	0
3500	0	0	3500	0	0	0	0
3600	0	0	3600	0	0	0	0
3700	0	0	3700	0	0	0	0
3800	0	0	3800	0	0	0	0
3900	0	0	3900	0	0	0	0
4000	0	0	4000	0	0	0	0
4100	0	0	4100	0	0	0	0
4200	0	0	4200	0	0	0	0
4300	0	0	4300	0	0	0	0
4400	0	0	4400	0	0	0	0
4500	0	0	4500	0	0	0	0
4600	1	86.535	4599.99	0.05	0.87	0.03	1
4700	2	86.535	4699.96	0.21	3.48	0.1	1
4800	3	86.535	4799.86	0.47	7.84	0.23	1
4900	4	86.535	4899.68	0.84	13.93	0.41	1
5000	5	86.535	4999.37	1.32	21.76	0.64	1
5100	6	86.535	5098.9	1.9	31.33	0.93	1
5135.42	6.354	86.535	5134.12	2.13	35.13	1.04	1
5200	6.354	86.535	5198.3	2.56	42.27	1.25	0
5300	6.354	86.535	5297.69	3.23	53.32	1.58	0
5400	6.354	86.535	5397.07	3.9	64.36	1.91	0
5500	6.354	86.535	5496.46	4.57	75.41	2.23	0
5600	6.354	86.535	5595.84	5.24	86.46	2.56	0
5700	6.354	86.535	5695.23	5.9	97.5	2.89	0
5800	6.354	86.535	5794.62	6.57	108.55	3.22	0
5900	6.354	86.535	5894	7.24	119.6	3.54	0
6000	6.354	86.535	5993.39	7.91	130.65	3.87	0
6100	6.354	86.535	6092.77	8.58	141.69	4.2	0
6200	6.354	86.535	6192.16	9.25	152.74	4.53	0
6300	6.354	86.535	6291.54	9.92	163.79	4.85	0
6400	6.354	86.535	6390.93	10.59	174.84	5.18	0
6500	6.354	86.535	6490.32	11.26	185.88	5.51	0
6600	6.354	86.535	6589.7	11.92	196.93	5.84	0
6700	6.354	86.535	6689.09	12.59	207.98	6.16	0
6800	6.354	86.535	6788.47	13.26	219.02	6.49	0
6900	6.354	86.535	6887.86	13.93	230.07	6.82	0
7000	6.354	86.535	6987.24	14.6	241.12	7.15	0
7100	6.354	86.535	7086.63	15.27	252.17	7.47	0
7200	6.354	86.535	7186.01	15.94	263.21	7.8	0
7300	6.354	86.535	7285.4	16.61	274.26	8.13	0
7400	6.354	86.535	7384.79	17.28	285.31	8.45	0
7500	6.354	86.535	7484.17	17.95	296.35	8.78	0
7600	6.354	86.535	7583.56	18.61	307.4	9.11	0
7700	6.354	86.535	7682.94	19.28	318.45	9.44	0

7800	6.354	86.535	7782.33	19.95	329.5	9.76	0
7900	6.354	86.535	7881.71	20.62	340.54	10.09	0
8000	6.354	86.535	7981.1	21.29	351.59	10.42	0
8100	6.354	86.535	8080.49	21.96	362.64	10.75	0
8200	6.354	86.535	8179.87	22.63	373.69	11.07	0
8300	6.354	86.535	8279.26	23.3	384.73	11.4	0
8400	6.354	86.535	8378.64	23.97	395.78	11.73	0
8500	6.354	86.535	8478.03	24.63	406.83	12.06	0
8600	6.354	86.535	8577.41	25.3	417.87	12.38	0
8700	6.354	86.535	8676.8	25.97	428.92	12.71	0
8800	6.354	86.535	8776.19	26.64	439.97	13.04	0
8900	6.354	86.535	8875.57	27.31	451.02	13.37	0
9000	6.354	86.535	8974.96	27.98	462.06	13.69	0
9100	6.354	86.535	9074.34	28.65	473.11	14.02	0
9200	6.354	86.535	9173.73	29.32	484.16	14.35	0
9300	6.354	86.535	9273.11	29.99	495.2	14.67	0
9400	6.354	86.535	9372.5	30.66	506.25	15	0
9500	6.354	86.535	9471.89	31.32	517.3	15.33	0
9600	6.354	86.535	9571.27	31.99	528.35	15.66	0
9700	6.354	86.535	9670.66	32.66	539.39	15.98	0
9800	6.354	86.535	9770.04	33.33	550.44	16.31	0
9837.44	6.354	86.535	9807.25	33.58	554.58	16.43	0
9900	5.416	86.535	9869.48	33.97	560.98	16.62	1.5
10000	3.916	86.535	9969.15	34.46	569.1	16.86	1.5
10100	2.416	86.535	10068.99	34.79	574.61	17.03	1.5
10200	0.916	86.535	10168.95	34.97	577.51	17.11	1.5
10261.06	0	0	10230	35	578	17.13	1.5
10300	0	0	10268.94	35	578	17.13	0
10400	0	0	10368.94	35	578	17.13	0
10500	0	0	10468.94	35	578	17.13	0
10600	0	0	10568.94	35	578	17.13	0
10611.1	0	0	10580.04	35	578	17.13	0
10700	8.89	180.037	10668.59	28.12	578	23.98	10
10800	18.89	180.037	10765.54	4.14	577.98	47.86	10
10900	28.89	180.037	10856.86	-36.31	577.95	88.14	10
11000	38.89	180.037	10939.76	-92	577.92	143.6	10
11100	48.89	180.037	11011.74	-161.24	577.87	212.56	10
11200	58.89	180.037	11070.6	-241.92	577.82	292.91	10
11300	68.89	180.037	11114.55	-331.61	577.76	382.23	10
11400	78.89	180.037	11142.26	-427.56	577.7	477.78	10
11500	88.89	180.037	11152.89	-526.86	577.64	576.68	10
11511.1	90	180.037	11153	-537.96	577.63	587.73	10
11600	90	180.037	11153	-626.86	577.57	676.27	0
11700	90	180.037	11153	-726.86	577.51	775.86	0
11800	90	180.037	11153	-826.86	577.44	875.45	0
11900	90	180.037	11153	-926.86	577.38	975.04	0
12000	90	180.037	11153	-1026.86	577.31	1074.62	0

12100	90	180.037	11153	-1126.86	577.25	1174.21	0
12200	90	180.037	11153	-1226.86	577.18	1273.8	0
12300	90	180.037	11153	-1326.86	577.12	1373.39	0
12400	90	180.037	11153	-1426.86	577.06	1472.98	0
12500	90	180.037	11153	-1526.86	576.99	1572.57	0
12600	90	180.037	11153	-1626.86	576.93	1672.16	0
12700	90	180.037	11153	-1726.86	576.86	1771.75	0
12800	90	180.037	11153	-1826.86	576.8	1871.34	0
12900	90	180.037	11153	-1926.86	576.73	1970.92	0
13000	90	180.037	11153	-2026.86	576.67	2070.51	0
13100	90	180.037	11153	-2126.86	576.6	2170.1	0
13200	90	180.037	11153	-2226.86	576.54	2269.69	0
13300	90	180.037	11153	-2326.86	576.47	2369.28	0
13400	90	180.037	11153	-2426.86	576.41	2468.87	0
13500	90	180.037	11153	-2526.86	576.34	2568.46	0
13600	90	180.037	11153	-2626.86	576.28	2668.05	0
13700	90	180.037	11153	-2726.86	576.22	2767.64	0
13800	90	180.037	11153	-2826.86	576.15	2867.22	0
13900	90	180.037	11153	-2926.86	576.09	2966.81	0
14000	90	180.037	11153	-3026.86	576.02	3066.4	0
14100	90	180.037	11153	-3126.86	575.96	3165.99	0
14200	90	180.037	11153	-3226.86	575.89	3265.58	0
14300	90	180.037	11153	-3326.86	575.83	3365.17	0
14400	90	180.037	11153	-3426.86	575.76	3464.76	0
14500	90	180.037	11153	-3526.86	575.7	3564.35	0
14600	90	180.037	11153	-3626.86	575.63	3663.93	0
14700	90	180.037	11153	-3726.86	575.57	3763.52	0
14800	90	180.037	11153	-3826.86	575.5	3863.11	0
14900	90	180.037	11153	-3926.86	575.44	3962.7	0
15000	90	180.037	11153	-4026.86	575.38	4062.29	0
15100	90	180.037	11153	-4126.86	575.31	4161.88	0
15200	90	180.037	11153	-4226.86	575.25	4261.47	0
15300	90	180.037	11153	-4326.86	575.18	4361.06	0
15400	90	180.037	11153	-4426.86	575.12	4460.65	0
15500	90	180.037	11153	-4526.86	575.05	4560.23	0
15600	90	180.037	11153	-4626.86	574.99	4659.82	0
15700	90	180.037	11153	-4726.86	574.92	4759.41	0
15800	90	180.037	11153	-4826.86	574.86	4859	0
15900	90	180.037	11153	-4926.86	574.79	4958.59	0
16000	90	180.037	11153	-5026.86	574.73	5058.18	0
16100	90	180.037	11153	-5126.86	574.66	5157.77	0
16200	90	180.037	11153	-5226.86	574.6	5257.36	0
16300	90	180.037	11153	-5326.86	574.54	5356.95	0
16400	90	180.037	11153	-5426.86	574.47	5456.53	0
16500	90	180.037	11153	-5526.86	574.41	5556.12	0
16600	90	180.037	11153	-5626.86	574.34	5655.71	0
16700	90	180.037	11153	-5726.86	574.28	5755.3	0

16800	90	180.037	11153	-5826.86	574.21	5854.89	0
16900	90	180.037	11153	-5926.86	574.15	5954.48	0
17000	90	180.037	11153	-6026.86	574.08	6054.07	0
17100	90	180.037	11153	-6126.86	574.02	6153.66	0
17200	90	180.037	11153	-6226.86	573.95	6253.25	0
17300	90	180.037	11153	-6326.86	573.89	6352.83	0
17327.72	90	180.037	11153	-6354.58	573.87	6380.44	0

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to RKB. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet.

Vertical Section is from Slot and calculated along an Azimuth of 174.840° (Grid).

Coordinate System is North American Datum 1983 US State Plane 1983, New Mexico Eastern Zone.

Central meridian is -104.333°.

Grid Convergence at Surface is 0.300°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 17327.72ft.,
the Bottom Hole Displacement is 6380.44ft., in the Direction of 174.840° (Grid).

Devon Energy

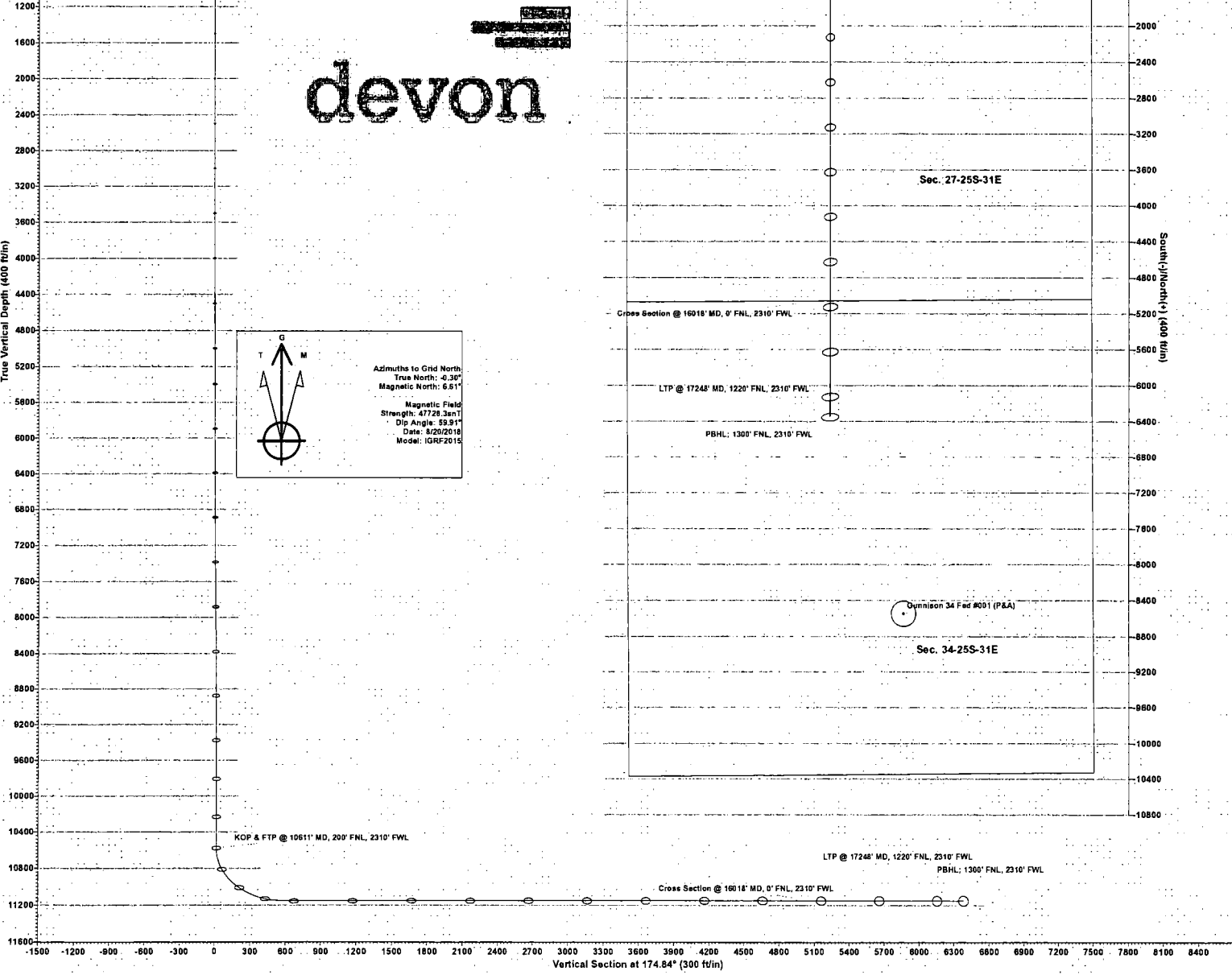
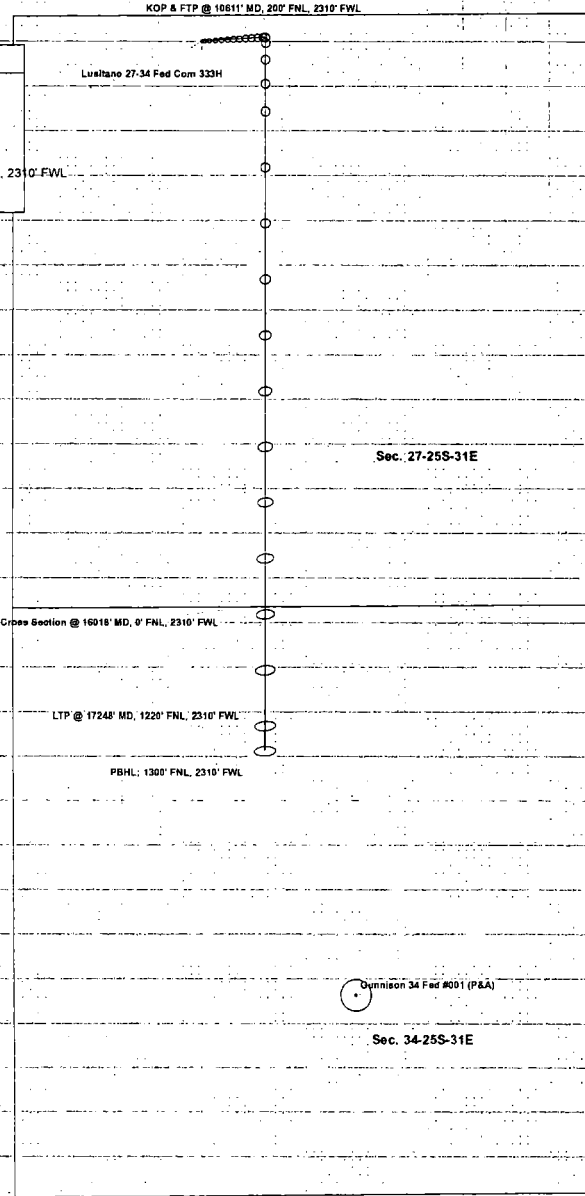
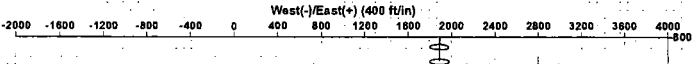
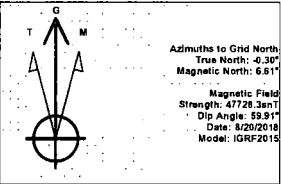
WELL DETAILS: Lusitano 27-34 Fed Com 333H

RKB @ 3360.20ft
3335.20
Northing 403449.84 Easting 716104.25 Latitude 32.107905 Longitude -103.768890

SECTION DETAILS Permit Plan 2

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
4500.00	0.00	0.00	4500.00	0.00	0.00	0.00	0.00	
5135.42	6.35	86.53	5134.12	2.13	35.13	1.00	1.04	
9837.44	6.35	86.53	9807.25	33.58	554.58	0.00	16.43	
10261.06	0.00	0.00	10230.00	35.00	578.00	1.50	17.13	
10611.10	0.00	0.00	10580.04	35.00	578.00	0.00	17.13	KOP & FTP @ 10611' MD, 200' FNL, 2310' FWL
11511.10	90.00	180.04	11153.00	-537.96	577.63	10.00	587.73	
17327.72	90.00	180.04	11153.00	-6354.58	573.87	0.00	6380.44	PBHL: 1300' FNL, 2310' FWL

devon



WCDSC Permian NM

Eddy County (NAD 83 NM Eastern)

Sec 27-T25S-R31E

Lusitano 27-34 Fed Com 333H

Wellbore #1

Permit Plan 2

Anticollision Report

17 December, 2018

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Reference	Permit Plan 2
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 50.00ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 1,500.00 ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Pedal Curve
Casing Method:	Not applied

Survey Tool Program		Date 12/17/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	17,327.72	Permit Plan 2 (Wellbore #1)	MWD+HDGM	OWSG MWD + HDGM

Summary						
Site Name:	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Sec 22-T25S-R31E						
Amoco DB Fed #001 (Active) - Wellbore #1 - Wellbore #1						Out of range
SOFTSHELL 22 FEDERAL 1H - Original Hole - Actual						Out of range
Sec 27-T25S-R31E						
Gunnison 34 Fed #001 (P&A) - Wellbore #1 - Wellbore #						Out of range
Lusitano 27_22 Fed Com 232H - Wellbore #1 - Permit PI	2,700.00	2,699.90	89.99	71.06	4.753	Alert, CC
Lusitano 27_22 Fed Com 232H - Wellbore #1 - Permit PI	2,800.00	2,799.28	90.33	70.68	4.598	Alert, ES
Lusitano 27_22 Fed Com 232H - Wellbore #1 - Permit PI	4,550.00	4,548.57	113.33	81.17	3.524	Alert, SF
Lusitano 27_34 Fed Com 523H - Wellbore #1 - Permit PI	8,003.99	8,006.38	91.46	34.25	1.599	Minor Risk, CC
Lusitano 27_34 Fed Com 523H - Wellbore #1 - Permit PI	8,050.00	8,052.11	91.61	34.06	1.592	Minor Risk, ES
Lusitano 27_34 Fed Com 523H - Wellbore #1 - Permit PI	8,100.00	8,101.80	92.08	34.18	1.590	Minor Risk, SF
Lusitano 27_34 Fed Com 534H - Wellbore #1 - Permit PI	2,615.21	2,613.78	149.10	130.82	8.154	CC
Lusitano 27_34 Fed Com 534H - Wellbore #1 - Permit PI	2,700.00	2,697.95	149.42	130.53	7.910	ES
Lusitano 27_34 Fed Com 534H - Wellbore #1 - Permit PI	8,900.00	8,951.63	350.74	287.59	5.554	SF
Lusitano 27_34 Fed Com 622H - Wellbore #1 - Permit PI	2,000.00	1,999.70	30.02	16.10	2.156	Minor Risk, CC
Lusitano 27_34 Fed Com 622H - Wellbore #1 - Permit PI	3,100.00	3,100.42	33.96	12.42	1.577	Minor Risk, ES
Lusitano 27_34 Fed Com 622H - Wellbore #1 - Permit PI	4,100.00	4,100.53	42.96	14.38	1.503	Minor Risk, SF
Lusitano 27_34 Fed Com 713H - Wellbore #1 - Permit PI	2,500.00	2,499.80	29.96	12.46	1.712	Minor Risk, CC
Lusitano 27_34 Fed Com 713H - Wellbore #1 - Permit PI	2,550.00	2,549.49	30.22	12.36	1.692	Minor Risk, ES, SF
Lusitano 27_34 Fed Com 716H - Wellbore #1 - Permit PI	10,735.62	10,761.22	1,360.03	1,283.98	17.883	CC
Lusitano 27_34 Fed Com 716H - Wellbore #1 - Permit PI	10,750.00	10,771.92	1,360.08	1,283.94	17.862	ES
Lusitano 27_34 Fed Com 716H - Wellbore #1 - Permit PI	13,700.00	14,509.83	1,499.88	1,393.82	14.141	SF
Lusitano 27_34 Fed Com 736H - Wellbore #1 - Permit PI						Out of range
Lusitano 27-34 Fed Com 235H - Wellbore #1 - Wellbore						Out of range
Lusitano 27-34 Fed Com 335H - Wellbore #1 - Permit Pla	10,300.00	10,282.65	1,345.94	1,273.25	18.516	CC
Lusitano 27-34 Fed Com 335H - Wellbore #1 - Permit Pla	17,327.72	17,337.79	1,367.49	1,167.06	6.823	ES, SF
Lusitano 27-34 Fed Com 336H - Wellbore #1 - Wellbore						Out of range
Lusitano 27-34 Fed Com 528H - Wellbore #1 - Wellbore						Out of range
Lusitano 27-34 Fed Com 536H - Wellbore #1 - Wellbore						Out of range
Lusitano 27-34 Fed Com 626H - Wellbore #1 - Wellbore						Out of range
Lusitano 27-34 Fed Com 718H - Wellbore #1 - Wellbore						Out of range

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design: Sec 27-T25S-R31E - Lusitano 27_22 Fed Com 232H - Wellbore #1 - Permit Plan 1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM												Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.10	-0.10	0.50	0.50	-90.36	-0.56	-89.99	89.99				
50.00	50.00	49.90	49.90	0.50	0.50	-90.36	-0.56	-89.99	89.99	88.99	1.01	89.412	
100.00	100.00	100.10	99.90	0.52	0.52	-90.36	-0.56	-89.99	89.99	88.96	1.04	86.898	
150.00	150.00	149.90	149.90	0.59	0.59	-90.36	-0.56	-89.99	89.99	88.81	1.18	76.246	
200.00	200.00	200.10	199.90	0.70	0.70	-90.36	-0.56	-89.99	89.99	88.59	1.40	64.076	
250.00	250.00	249.90	249.90	0.84	0.84	-90.36	-0.56	-89.99	89.99	88.32	1.68	53.722	
300.00	300.00	300.10	299.90	0.99	0.99	-90.36	-0.56	-89.99	89.99	88.02	1.97	45.566	
350.00	350.00	349.90	349.90	1.15	1.15	-90.36	-0.56	-89.99	89.99	87.70	2.29	39.286	
400.00	400.00	400.10	399.90	1.31	1.31	-90.36	-0.56	-89.99	89.99	87.37	2.62	34.368	
450.00	450.00	449.90	449.90	1.48	1.48	-90.36	-0.56	-89.99	89.99	87.04	2.95	30.482	
500.00	500.00	500.10	499.90	1.65	1.65	-90.36	-0.56	-89.99	89.99	86.70	3.29	27.332	
550.00	550.00	549.90	549.90	1.82	1.82	-90.36	-0.56	-89.99	89.99	86.36	3.63	24.757	
600.00	600.00	600.10	599.90	1.99	1.99	-90.36	-0.56	-89.99	89.99	86.01	3.98	22.602	
650.00	650.00	649.90	649.90	2.16	2.16	-90.36	-0.56	-89.99	89.99	85.66	4.33	20.789	
700.00	700.00	700.10	699.90	2.34	2.34	-90.36	-0.56	-89.99	89.99	85.31	4.68	19.233	
750.00	750.00	749.90	749.90	2.51	2.51	-90.36	-0.56	-89.99	89.99	84.96	5.03	17.894	
800.00	800.00	800.10	799.90	2.69	2.69	-90.36	-0.56	-89.99	89.99	84.61	5.38	16.722	
850.00	850.00	849.90	849.90	2.87	2.87	-90.36	-0.56	-89.99	89.99	84.26	5.73	15.696	
900.00	900.00	900.10	899.90	3.04	3.04	-90.36	-0.56	-89.99	89.99	83.90	6.09	14.783	
950.00	950.00	949.90	949.90	3.22	3.22	-90.36	-0.56	-89.99	89.99	83.55	6.44	13.973	
1,000.00	1,000.00	1,000.10	999.90	3.40	3.40	-90.36	-0.56	-89.99	89.99	83.20	6.80	13.243	
1,050.00	1,050.00	1,049.90	1,049.90	3.58	3.57	-90.36	-0.56	-89.99	89.99	82.84	7.15	12.587	
1,100.00	1,100.00	1,100.10	1,099.90	3.75	3.75	-90.36	-0.56	-89.99	89.99	82.49	7.51	11.990	
1,150.00	1,150.00	1,149.90	1,149.90	3.93	3.93	-90.36	-0.56	-89.99	89.99	82.13	7.86	11.449	
1,200.00	1,200.00	1,200.10	1,199.90	4.11	4.11	-90.36	-0.56	-89.99	89.99	81.78	8.22	10.952	
1,250.00	1,250.00	1,249.90	1,249.90	4.29	4.29	-90.36	-0.56	-89.99	89.99	81.42	8.57	10.499	
1,300.00	1,300.00	1,300.10	1,299.90	4.46	4.46	-90.36	-0.56	-89.99	89.99	81.06	8.93	10.079	
1,350.00	1,350.00	1,349.90	1,349.90	4.64	4.64	-90.36	-0.56	-89.99	89.99	80.71	9.28	9.693	
1,400.00	1,400.00	1,400.10	1,399.90	4.82	4.82	-90.36	-0.56	-89.99	89.99	80.35	9.64	9.334	
1,450.00	1,450.00	1,449.90	1,449.90	5.00	5.00	-90.36	-0.56	-89.99	89.99	79.99	10.00	9.002	
1,500.00	1,500.00	1,500.10	1,499.90	5.18	5.18	-90.36	-0.56	-89.99	89.99	79.64	10.35	8.691	
1,550.00	1,550.00	1,549.90	1,549.90	5.36	5.36	-90.36	-0.56	-89.99	89.99	79.28	10.71	8.402	
1,600.00	1,600.00	1,600.10	1,599.90	5.53	5.53	-90.36	-0.56	-89.99	89.99	78.92	11.07	8.130	
1,650.00	1,650.00	1,649.90	1,649.90	5.71	5.71	-90.36	-0.56	-89.99	89.99	78.57	11.42	7.877	
1,700.00	1,700.00	1,700.10	1,699.90	5.89	5.89	-90.36	-0.56	-89.99	89.99	78.21	11.78	7.638	
1,750.00	1,750.00	1,749.90	1,749.90	6.07	6.07	-90.36	-0.56	-89.99	89.99	77.85	12.14	7.413	
1,800.00	1,800.00	1,800.10	1,799.90	6.25	6.25	-90.36	-0.56	-89.99	89.99	77.49	12.50	7.201	
1,850.00	1,850.00	1,849.90	1,849.90	6.43	6.43	-90.36	-0.56	-89.99	89.99	77.14	12.85	7.001	
1,900.00	1,900.00	1,900.10	1,899.90	6.61	6.61	-90.36	-0.56	-89.99	89.99	76.78	13.21	6.811	
1,950.00	1,950.00	1,949.90	1,949.90	6.78	6.78	-90.36	-0.56	-89.99	89.99	76.42	13.57	6.632	
2,000.00	2,000.00	2,000.10	1,999.90	6.96	6.96	-90.36	-0.56	-89.99	89.99	76.06	13.93	6.462	
2,050.00	2,050.00	2,049.90	2,049.90	7.14	7.14	-90.36	-0.56	-89.99	89.99	75.71	14.28	6.300	
2,100.00	2,100.00	2,100.10	2,099.90	7.32	7.32	-90.36	-0.56	-89.99	89.99	75.35	14.64	6.146	
2,150.00	2,150.00	2,149.90	2,149.90	7.50	7.50	-90.36	-0.56	-89.99	89.99	74.99	15.00	6.000	
2,200.00	2,200.00	2,200.10	2,199.90	7.68	7.68	-90.36	-0.56	-89.99	89.99	74.63	15.36	5.860	
2,250.00	2,250.00	2,249.90	2,249.90	7.86	7.86	-90.36	-0.56	-89.99	89.99	74.28	15.71	5.727	
2,300.00	2,300.00	2,300.10	2,299.90	8.04	8.04	-90.36	-0.56	-89.99	89.99	73.92	16.07	5.599	
2,350.00	2,350.00	2,349.90	2,349.90	8.22	8.21	-90.36	-0.56	-89.99	89.99	73.56	16.43	5.477	
2,400.00	2,400.00	2,400.10	2,399.90	8.39	8.39	-90.36	-0.56	-89.99	89.99	73.20	16.79	5.360	
2,450.00	2,450.00	2,449.90	2,449.90	8.57	8.57	-90.36	-0.56	-89.99	89.99	72.85	17.15	5.249	
2,500.00	2,500.00	2,500.10	2,499.90	8.75	8.75	-90.36	-0.56	-89.99	89.99	72.49	17.50	5.141	
2,550.00	2,550.00	2,549.90	2,549.90	8.93	8.93	-90.36	-0.56	-89.99	89.99	72.13	17.86	5.038	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Sec 27-T25S-R31E - Lusitano 27 22 Fed Com 232H - Wellbore #1 - Permit Plan 1		Offset Site Error: 0.00 ft	
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.50 ft			
Reference		Offset		Semi-Major Axis			Distance			Minimum		Separation		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Separation (ft)	Factor					
2,600.00	2,600.00	2,600.10	2,599.90	9.11	9.11	-90.36	-0.56	-89.99	89.99	71.77	18.22	4.939	Alert				
2,650.00	2,650.00	2,649.90	2,649.90	9.29	9.29	-90.36	-0.56	-89.99	89.99	71.41	18.58	4.844	Alert				
2,700.00	2,700.00	2,699.90	2,699.90	9.47	9.47	-90.36	-0.56	-89.99	89.99	71.06	18.94	4.753	Alert, CC				
2,750.00	2,750.00	2,749.60	2,749.60	9.65	9.65	-90.23	-0.36	-90.07	90.08	70.78	19.29	4.669	Alert				
2,800.00	2,800.00	2,799.28	2,799.28	9.83	9.82	-89.85	0.23	-90.33	90.33	70.68	19.65	4.598	Alert, ES				
2,850.00	2,850.00	2,849.05	2,849.03	10.00	10.00	-89.24	1.21	-90.75	90.76	70.76	20.00	4.537	Alert				
2,900.00	2,900.00	2,900.97	2,899.00	10.18	10.19	-88.56	2.29	-91.21	91.25	70.88	20.37	4.480	Alert				
2,950.00	2,950.00	2,949.02	2,948.97	10.36	10.36	-87.90	3.37	-91.68	91.74	71.03	20.72	4.428	Alert				
3,000.00	3,000.00	3,001.00	2,998.95	10.54	10.54	-87.24	4.45	-92.14	92.25	71.17	21.08	4.376	Alert				
3,050.00	3,050.00	3,048.99	3,048.92	10.72	10.71	-86.58	5.53	-92.61	92.78	71.35	21.43	4.329	Alert				
3,100.00	3,100.00	3,101.02	3,098.89	10.90	10.90	-85.94	6.61	-93.07	93.31	71.52	21.80	4.281	Alert				
3,150.00	3,150.00	3,148.96	3,148.86	11.08	11.07	-85.30	7.69	-93.54	93.86	71.71	22.15	4.238	Alert				
3,200.00	3,200.00	3,201.05	3,198.84	11.26	11.26	-84.67	8.78	-94.00	94.42	71.91	22.51	4.194	Alert				
3,250.00	3,250.00	3,248.94	3,248.81	11.44	11.43	-84.04	9.86	-94.47	94.99	72.12	22.86	4.155	Alert				
3,300.00	3,300.00	3,301.08	3,298.78	11.62	11.61	-83.43	10.94	-94.93	95.57	72.34	23.23	4.115	Alert				
3,350.00	3,350.00	3,348.91	3,348.75	11.80	11.78	-82.82	12.02	-95.40	96.16	72.58	23.58	4.079	Alert				
3,400.00	3,400.00	3,401.11	3,398.73	11.97	11.97	-82.22	13.10	-95.86	96.76	72.82	23.94	4.042	Alert				
3,450.00	3,450.00	3,448.88	3,448.70	12.15	12.14	-81.62	14.18	-96.32	97.37	73.08	24.29	4.009	Alert				
3,500.00	3,500.00	3,501.13	3,498.67	12.33	12.33	-81.04	15.27	-96.79	97.99	73.34	24.66	3.974	Alert				
3,550.00	3,550.00	3,548.85	3,548.64	12.51	12.50	-80.46	16.35	-97.25	98.63	73.62	25.01	3.944	Alert				
3,600.00	3,600.00	3,601.16	3,598.61	12.69	12.69	-79.89	17.43	-97.72	99.27	73.90	25.37	3.913	Alert				
3,650.00	3,650.00	3,648.82	3,648.59	12.87	12.86	-79.32	18.51	-98.18	99.92	74.20	25.72	3.885	Alert				
3,700.00	3,700.00	3,701.19	3,698.56	13.05	13.04	-78.77	19.59	-98.65	100.58	74.50	26.09	3.856	Alert				
3,750.00	3,750.00	3,748.80	3,748.53	13.23	13.21	-78.22	20.67	-99.11	101.25	74.82	26.44	3.830	Alert				
3,800.00	3,800.00	3,801.22	3,798.50	13.41	13.40	-77.68	21.75	-99.58	101.94	75.13	26.80	3.803	Alert				
3,850.00	3,850.00	3,848.77	3,848.48	13.59	13.57	-77.14	22.84	-100.04	102.63	75.47	27.15	3.780	Alert				
3,900.00	3,900.00	3,901.24	3,898.45	13.77	13.76	-76.61	23.92	-100.51	103.32	75.81	27.52	3.755	Alert				
3,950.00	3,950.00	3,948.74	3,948.42	13.94	13.93	-76.09	25.00	-100.97	104.03	76.16	27.87	3.733	Alert				
4,000.00	4,000.00	4,001.27	3,998.39	14.12	14.12	-75.58	26.08	-101.44	104.75	76.51	28.23	3.710	Alert				
4,050.00	4,050.00	4,048.71	4,048.36	14.30	14.29	-75.07	27.16	-101.90	105.47	76.89	28.58	3.690	Alert				
4,100.00	4,100.00	4,101.30	4,098.34	14.48	14.48	-74.58	28.24	-102.37	106.20	77.25	28.95	3.669	Alert				
4,150.00	4,150.00	4,148.69	4,148.31	14.66	14.65	-74.08	29.33	-102.83	106.94	77.64	29.30	3.650	Alert				
4,200.00	4,200.00	4,201.33	4,198.28	14.84	14.83	-73.60	30.41	-103.29	107.69	78.02	29.66	3.630	Alert				
4,250.00	4,250.00	4,248.66	4,248.25	15.02	15.00	-73.12	31.49	-103.76	108.44	78.43	30.01	3.613	Alert				
4,300.00	4,300.00	4,298.64	4,298.23	15.20	15.18	-72.65	32.57	-104.22	109.21	78.84	30.37	3.596	Alert				
4,350.00	4,350.00	4,348.63	4,348.20	15.38	15.36	-72.18	33.65	-104.69	109.98	79.25	30.73	3.579	Alert				
4,400.00	4,400.00	4,401.38	4,398.17	15.56	15.55	-71.72	34.73	-105.15	110.75	79.66	31.10	3.562	Alert				
4,450.00	4,450.00	4,448.60	4,448.14	15.74	15.72	-71.27	35.81	-105.62	111.54	80.09	31.44	3.547	Alert				
4,500.00	4,500.00	4,501.41	4,498.12	15.92	15.91	-70.82	36.90	-106.08	112.33	80.52	31.81	3.531	Alert				
4,550.00	4,550.00	4,548.57	4,548.09	16.09	16.08	-156.96	37.98	-106.55	113.33	81.17	32.16	3.524	Alert, SF				
4,600.00	4,600.00	4,601.45	4,598.05	16.26	16.27	-156.65	39.06	-107.01	114.73	82.21	32.52	3.528	Alert				
4,650.00	4,649.98	4,648.51	4,648.00	16.44	16.44	-156.43	40.14	-107.48	116.54	83.68	32.86	3.547	Alert				
4,700.00	4,699.96	4,701.54	4,697.94	16.61	16.63	-156.30	41.22	-107.94	118.75	85.53	33.22	3.575	Alert				
4,750.00	4,749.92	4,748.40	4,747.85	16.78	16.79	-156.26	42.30	-108.40	121.35	87.80	33.56	3.616	Alert				
4,800.00	4,799.86	4,801.69	4,797.75	16.95	16.98	-156.30	43.38	-108.87	124.36	90.44	33.92	3.666	Alert				
4,850.00	4,849.78	4,848.19	4,847.62	17.12	17.15	-156.41	44.46	-109.33	127.77	93.51	34.26	3.730	Alert				
4,900.00	4,899.68	4,901.96	4,897.46	17.30	17.34	-156.60	45.54	-109.80	131.57	96.95	34.62	3.800	Alert				
4,950.00	4,949.54	4,947.86	4,947.26	17.47	17.51	-156.84	46.62	-110.26	135.78	100.82	34.96	3.884	Alert				
5,000.00	4,999.37	5,002.36	4,997.03	17.64	17.70	-157.13	47.69	-110.72	140.39	105.06	35.32	3.974	Alert				
5,050.00	5,049.16	5,047.38	5,046.76	17.82	17.86	-157.47	48.77	-111.18	145.40	109.74	35.66	4.078	Alert				
5,100.00	5,098.90	5,102.92	5,096.44	17.99	18.06	-157.85	49.85	-111.65	150.82	114.80	36.03	4.187	Alert				
5,150.00	5,148.61	5,146.72	5,146.07	18.16	18.22	-158.26	50.92	-112.11	156.63	120.28	36.35	4.309	Alert				

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre N-S (ft)	Offset Wellbore Centre E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
5,200.00	5,198.30	5,203.64	5,195.69	18.34	18.42	-158.67	51.99	-112.57	162.56	125.83	36.73	4.426	Alert		
5,250.00	5,247.99	5,245.99	5,245.31	18.52	18.58	-159.06	53.07	-113.03	168.49	131.44	37.05	4.547	Alert		
5,300.00	5,297.69	5,304.37	5,294.93	18.69	18.79	-159.41	54.14	-113.49	174.42	136.99	37.43	4.660	Alert		
5,350.00	5,347.38	5,345.26	5,344.56	18.87	18.93	-159.74	55.22	-113.95	180.37	142.62	37.75	4.778	Alert		
5,400.00	5,397.07	5,394.90	5,394.18	19.04	19.11	-160.06	56.29	-114.41	186.32	148.22	38.10	4.890	Alert		
5,450.00	5,446.77	5,444.53	5,443.80	19.22	19.29	-160.35	57.36	-114.88	192.27	153.82	38.45	5.001			
5,500.00	5,496.46	5,505.83	5,493.42	19.40	19.51	-160.62	58.44	-115.34	198.23	159.39	38.84	5.104			
5,550.00	5,546.15	5,543.80	5,543.04	19.58	19.64	-160.88	59.51	-115.80	204.19	165.04	39.15	5.216			
5,600.00	5,595.84	5,606.56	5,592.66	19.75	19.87	-161.12	60.59	-116.26	210.16	170.61	39.55	5.314			
5,650.00	5,645.54	5,643.07	5,642.28	19.93	20.00	-161.36	61.66	-116.72	216.13	176.28	39.85	5.423			
5,700.00	5,695.23	5,707.29	5,691.90	20.11	20.23	-161.57	62.73	-117.18	222.11	181.85	40.25	5.518			
5,750.00	5,744.92	5,742.34	5,741.52	20.29	20.36	-161.78	63.81	-117.64	228.08	187.53	40.55	5.624			
5,800.00	5,794.62	5,808.02	5,791.15	20.47	20.59	-161.98	64.88	-118.11	234.06	193.10	40.96	5.714			
5,850.00	5,844.31	5,841.61	5,840.77	20.65	20.71	-162.16	65.96	-118.57	240.04	198.79	41.26	5.818			
5,900.00	5,894.00	5,908.75	5,890.39	20.83	20.95	-162.34	67.03	-119.03	246.03	204.36	41.67	5.904			
5,950.00	5,943.69	5,940.88	5,940.01	21.01	21.07	-162.51	68.10	-119.49	252.02	210.06	41.96	6.006			
6,000.00	5,993.39	6,009.48	5,989.63	21.19	21.31	-162.67	69.18	-119.95	258.00	215.63	42.38	6.088			
6,050.00	6,043.08	6,040.15	6,039.25	21.37	21.42	-162.82	70.25	-120.41	263.99	221.33	42.66	6.188			
6,100.00	6,092.77	6,089.79	6,088.87	21.55	21.60	-162.97	71.33	-120.87	269.99	226.97	43.01	6.277			
6,150.00	6,142.47	6,139.42	6,138.49	21.73	21.78	-163.11	72.40	-121.34	275.98	232.61	43.37	6.364			
6,200.00	6,192.16	6,189.06	6,188.12	21.91	21.96	-163.25	73.47	-121.80	281.98	238.26	43.72	6.450			
6,250.00	6,241.85	6,238.69	6,237.74	22.09	22.14	-163.37	74.55	-122.26	287.97	243.90	44.07	6.534			
6,300.00	6,291.54	6,288.33	6,287.36	22.27	22.31	-163.50	75.62	-122.72	293.97	249.55	44.42	6.617			
6,350.00	6,341.24	6,337.96	6,336.98	22.46	22.49	-163.62	76.70	-123.18	299.97	255.20	44.78	6.699			
6,400.00	6,390.93	6,387.60	6,386.60	22.64	22.67	-163.73	77.77	-123.64	305.97	260.84	45.13	6.780			
6,450.00	6,440.62	6,437.23	6,436.22	22.82	22.85	-163.84	78.84	-124.10	311.98	266.49	45.48	6.859			
6,500.00	6,490.32	6,486.87	6,485.84	23.00	23.03	-163.95	79.92	-124.57	317.98	272.14	45.84	6.937			
6,550.00	6,540.01	6,536.50	6,535.46	23.19	23.20	-164.05	80.99	-125.03	323.98	277.79	46.19	7.014			
6,600.00	6,589.70	6,586.14	6,585.08	23.37	23.38	-164.15	82.07	-125.49	329.99	283.45	46.54	7.090			
6,650.00	6,639.39	6,635.77	6,634.71	23.55	23.56	-164.24	83.14	-125.95	336.00	289.10	46.90	7.165			
6,700.00	6,689.09	6,685.41	6,684.33	23.73	23.74	-164.33	84.21	-126.41	342.00	294.75	47.25	7.238			
6,750.00	6,738.78	6,735.04	6,733.95	23.92	23.92	-164.42	85.29	-126.87	348.01	300.41	47.60	7.311			
6,800.00	6,788.47	6,784.68	6,783.57	24.10	24.09	-164.50	86.36	-127.33	354.02	306.06	47.96	7.382			
6,850.00	6,838.17	6,834.31	6,833.19	24.29	24.27	-164.59	87.43	-127.80	360.03	311.72	48.31	7.452			
6,900.00	6,887.86	6,883.95	6,882.81	24.47	24.45	-164.67	88.51	-128.26	366.04	317.37	48.67	7.521			
6,950.00	6,937.55	6,933.58	6,932.43	24.65	24.63	-164.74	89.58	-128.72	372.05	323.03	49.02	7.590			
7,000.00	6,987.24	6,983.22	6,982.05	24.84	24.81	-164.82	90.66	-129.18	378.06	328.69	49.37	7.657			
7,050.00	7,036.94	7,032.85	7,031.68	25.02	24.99	-164.89	91.73	-129.64	384.07	334.35	49.73	7.723			
7,100.00	7,086.63	7,082.49	7,081.30	25.21	25.16	-164.96	92.80	-130.10	390.09	340.00	50.08	7.789			
7,150.00	7,136.32	7,132.12	7,130.92	25.39	25.34	-165.03	93.88	-130.56	396.10	345.66	50.44	7.853			
7,200.00	7,186.02	7,181.76	7,180.54	25.58	25.52	-165.09	94.95	-131.03	402.11	351.32	50.79	7.917			
7,250.00	7,235.71	7,231.39	7,230.16	25.76	25.70	-165.16	96.03	-131.49	408.13	356.98	51.15	7.979			
7,300.00	7,285.40	7,281.03	7,279.78	25.95	25.88	-165.22	97.10	-131.95	414.14	362.64	51.50	8.041			
7,350.00	7,335.09	7,330.66	7,329.40	26.13	26.05	-165.28	98.17	-132.41	420.16	368.30	51.86	8.102			
7,400.00	7,384.79	7,380.30	7,379.02	26.32	26.23	-165.34	99.25	-132.87	426.17	373.96	52.21	8.162			
7,450.00	7,434.48	7,429.93	7,428.65	26.50	26.41	-165.39	100.32	-133.33	432.19	379.62	52.57	8.222			
7,500.00	7,484.17	7,479.57	7,478.27	26.69	26.59	-165.45	101.40	-133.79	438.21	385.28	52.92	8.280			
7,550.00	7,533.86	7,529.20	7,527.89	26.87	26.77	-165.50	102.47	-134.26	444.22	390.95	53.28	8.338			
7,600.00	7,583.56	7,578.84	7,577.51	27.06	26.94	-165.55	103.54	-134.72	450.24	396.61	53.63	8.395			
7,650.00	7,633.25	7,628.47	7,627.13	27.25	27.12	-165.61	104.62	-135.18	456.26	402.27	53.99	8.451			
7,700.00	7,682.94	7,678.11	7,676.75	27.43	27.30	-165.66	105.69	-135.64	462.28	407.93	54.34	8.506			
7,750.00	7,732.64	7,727.74	7,726.37	27.62	27.48	-165.70	106.77	-136.10	468.30	413.50	54.70	8.561			

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.50 ft
Reference														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre N/S (ft)	Offset Wellbore Centre E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
7,800.00	7,782.33	7,777.38	7,775.99	27.81	27.66	-165.75	107.84	-136.56	474.31	419.26	55.06	8.615		
7,850.00	7,832.02	7,827.01	7,825.61	27.99	27.84	-165.80	108.91	-137.02	480.33	424.92	55.41	8.669		
7,900.00	7,881.71	7,876.65	7,875.24	28.18	28.01	-165.84	109.99	-137.48	486.35	430.59	55.77	8.721		
7,950.00	7,931.41	7,926.28	7,924.86	28.37	28.19	-165.89	111.06	-137.95	492.37	436.25	56.12	8.773		
8,000.00	7,981.10	7,975.92	7,974.48	28.55	28.37	-165.93	112.14	-138.41	498.39	441.91	56.48	8.824		
8,050.00	8,030.79	8,025.55	8,024.10	28.74	28.55	-165.97	113.21	-138.87	504.41	447.58	56.83	8.875		
8,100.00	8,080.49	8,075.19	8,073.72	28.93	28.73	-166.01	114.28	-139.33	510.43	453.24	57.19	8.925		
8,150.00	8,130.18	8,124.82	8,123.34	29.11	28.90	-166.05	115.36	-139.79	516.45	458.91	57.55	8.974		
8,200.00	8,179.87	8,174.46	8,172.96	29.30	29.08	-166.09	116.43	-140.25	522.47	464.57	57.90	9.023		
8,250.00	8,229.56	8,224.09	8,222.58	29.49	29.26	-166.13	117.51	-140.71	528.49	470.23	58.26	9.071		
8,300.00	8,279.26	8,273.73	8,272.21	29.68	29.44	-166.16	118.58	-141.18	534.52	475.90	58.62	9.119		
8,350.00	8,328.95	8,323.36	8,321.83	29.86	29.62	-166.20	119.65	-141.64	540.54	481.56	58.97	9.166		
8,400.00	8,378.64	8,373.00	8,371.45	30.05	29.79	-166.24	120.73	-142.10	546.56	487.23	59.33	9.212		
8,450.00	8,428.34	8,422.63	8,421.07	30.24	29.97	-166.27	121.80	-142.56	552.58	492.90	59.69	9.258		
8,500.00	8,478.03	8,472.27	8,470.69	30.43	30.15	-166.30	122.88	-143.02	558.60	498.56	60.04	9.304		
8,550.00	8,527.72	8,521.90	8,520.31	30.62	30.33	-166.34	123.95	-143.48	564.63	504.23	60.40	9.348		
8,600.00	8,577.41	8,571.54	8,569.93	30.80	30.51	-166.37	125.02	-143.94	570.65	509.89	60.76	9.393		
8,650.00	8,627.11	8,621.17	8,619.55	30.99	30.69	-166.40	126.10	-144.41	576.67	515.56	61.11	9.436		
8,700.00	8,676.80	8,670.81	8,669.17	31.18	30.86	-166.43	127.17	-144.87	582.69	521.22	61.47	9.480		
8,750.00	8,726.49	8,720.44	8,718.80	31.37	31.04	-166.46	128.25	-145.33	588.72	526.89	61.83	9.522		
8,800.00	8,776.19	8,770.08	8,768.42	31.56	31.22	-166.49	129.32	-145.79	594.74	532.56	62.18	9.564		
8,850.00	8,825.88	8,819.71	8,818.04	31.74	31.40	-166.52	130.39	-146.25	600.76	538.22	62.54	9.606		
8,900.00	8,875.57	8,869.35	8,867.66	31.93	31.58	-166.55	131.47	-146.71	606.79	543.89	62.90	9.647		
8,950.00	8,925.26	8,918.98	8,917.28	32.12	31.76	-166.58	132.54	-147.17	612.81	549.56	63.25	9.688		
9,000.00	8,974.96	8,969.28	8,967.57	32.31	31.94	-166.61	133.62	-147.64	618.83	555.22	63.61	9.728		
9,050.00	9,024.65	9,023.78	9,022.06	32.50	32.13	-166.68	134.35	-147.95	624.61	560.61	64.00	9.760		
9,100.00	9,074.34	9,075.96	9,074.24	32.69	32.32	-166.79	134.44	-147.99	630.05	565.68	64.37	9.788		
9,150.00	9,124.04	9,125.66	9,123.94	32.88	32.49	-166.90	134.44	-147.99	635.44	570.71	64.72	9.818		
9,200.00	9,173.73	9,175.35	9,173.63	33.07	32.67	-167.02	134.44	-147.99	640.83	575.75	65.08	9.847		
9,250.00	9,223.42	9,225.04	9,223.32	33.25	32.85	-167.13	134.44	-147.99	646.22	580.79	65.44	9.875		
9,300.00	9,273.11	9,274.73	9,273.01	33.44	33.03	-167.23	134.44	-147.99	651.62	585.83	65.79	9.904		
9,350.00	9,322.81	9,324.43	9,322.71	33.63	33.21	-167.34	134.44	-147.99	657.02	590.87	66.15	9.932		
9,400.00	9,372.50	9,374.12	9,372.40	33.82	33.38	-167.45	134.44	-147.99	662.42	595.91	66.51	9.960		
9,450.00	9,422.19	9,420.64	9,418.91	34.01	33.55	-167.52	134.75	-147.99	667.88	601.03	66.85	9.991		
9,500.00	9,471.89	9,462.99	9,461.16	34.20	33.70	-167.35	137.71	-147.95	673.79	606.63	67.16	10.032		
9,550.00	9,521.58	9,504.74	9,502.47	34.39	33.85	-166.94	143.67	-147.89	680.27	612.80	67.47	10.082		
9,600.00	9,571.27	9,545.46	9,542.24	34.58	34.00	-166.30	152.36	-147.79	687.38	619.62	67.76	10.144		
9,650.00	9,620.96	9,584.79	9,579.98	34.77	34.13	-165.47	163.43	-147.67	695.24	627.21	68.03	10.220		
9,700.00	9,670.66	9,622.47	9,615.33	34.96	34.27	-164.49	176.42	-147.53	703.97	635.72	68.26	10.313		
9,750.00	9,720.35	9,658.27	9,648.07	35.15	34.39	-163.41	190.90	-147.37	713.73	645.28	68.45	10.428		
9,800.00	9,770.04	9,692.10	9,678.11	35.34	34.51	-162.25	206.44	-147.20	724.64	656.06	68.58	10.566		
9,850.00	9,819.74	9,723.88	9,705.46	35.53	34.62	-161.07	222.62	-147.02	736.82	668.17	68.65	10.733		
9,900.00	9,869.48	9,750.00	9,727.23	35.72	34.71	-160.09	237.04	-146.86	749.99	681.40	68.59	10.934		
9,950.00	9,919.29	9,781.41	9,752.51	35.90	34.82	-158.82	255.68	-146.66	764.07	695.50	68.57	11.143		
10,000.00	9,969.15	9,807.25	9,772.52	36.09	34.91	-157.74	272.03	-146.48	779.18	710.78	68.40	11.391		
10,050.00	10,019.05	9,831.27	9,790.44	36.27	34.99	-156.70	288.02	-146.30	795.39	727.24	68.15	11.672		
10,100.00	10,068.99	9,850.00	9,803.94	36.45	35.05	-155.90	301.00	-146.16	812.76	745.02	67.74	11.998		
10,150.00	10,118.96	9,874.23	9,820.76	36.63	35.14	-154.82	318.44	-145.97	831.30	763.91	67.39	12.335		
10,200.00	10,168.95	9,900.00	9,837.82	36.80	35.23	-153.64	337.75	-145.76	851.10	784.07	67.03	12.697		
10,250.00	10,218.94	9,911.18	9,844.95	36.98	35.27	-153.22	346.36	-145.66	872.02	805.68	66.34	13.145		
10,300.00	10,268.94	9,927.69	9,855.16	37.15	35.32	-152.86	359.33	-145.52	894.32	828.60	65.72	13.608		
10,350.00	10,318.94	9,950.00	9,868.37	37.32	35.40	-152.67	377.31	-145.32	918.31	853.10	65.22	14.081		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:
Sec 27-T25S-R31E - Lusitano 27 22 Fed Com 232H - Wellbore #1 - Permit Plan 1													0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:
													0.50 ft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre: N-S (ft)	Offset Wellbore Centre: E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,400.00	10,368.94	9,950.00	9,868.37	37.49	35.40	-64.67	377.31	-145.32	943.85	879.84	64.21	14.699	
10,450.00	10,418.94	9,970.65	9,879.96	37.67	35.47	-63.57	394.40	-145.14	970.82	907.15	63.67	15.247	
10,500.00	10,468.94	9,983.09	9,886.64	37.84	35.52	-62.91	404.89	-145.02	999.27	936.31	62.96	15.872	
10,550.00	10,518.94	10,000.00	9,895.35	38.01	35.58	-62.00	419.38	-144.86	1,029.09	966.73	62.36	16.503	
10,600.00	10,568.94	10,000.00	9,895.35	38.19	35.58	-62.00	419.38	-144.86	1,060.13	998.71	61.41	17.263	
10,650.00	10,618.91	10,015.31	9,902.87	38.35	35.63	115.77	432.71	-144.72	1,092.76	1,031.92	60.84	17.961	
10,700.00	10,668.59	10,022.87	9,906.45	38.52	35.66	111.73	439.37	-144.64	1,127.85	1,067.67	60.17	18.743	
10,750.00	10,717.59	10,028.35	9,908.99	38.67	35.68	106.85	444.23	-144.59	1,165.01	1,105.46	59.55	19.562	
10,800.00	10,765.54	10,031.90	9,910.61	38.83	35.69	101.13	447.39	-144.56	1,203.85	1,144.86	58.99	20.407	
10,850.00	10,812.08	10,033.67	9,911.41	38.97	35.69	94.61	448.96	-144.54	1,243.97	1,185.47	58.50	21.266	
10,900.00	10,856.86	10,033.80	9,911.47	39.11	35.70	87.45	449.08	-144.54	1,284.97	1,226.90	58.07	22.127	
10,950.00	10,899.53	10,032.43	9,910.85	39.24	35.69	79.95	447.86	-144.55	1,326.49	1,268.76	57.73	22.979	
11,000.00	10,939.76	10,029.71	9,909.62	39.36	35.68	72.44	445.44	-144.58	1,368.15	1,310.70	57.45	23.813	
11,050.00	10,977.26	10,025.77	9,907.80	39.48	35.67	65.26	441.94	-144.62	1,409.62	1,352.36	57.26	24.620	
11,100.00	11,011.74	10,020.72	9,905.44	39.58	35.65	58.67	437.48	-144.66	1,450.58	1,393.45	57.13	25.391	
11,150.00	11,042.93	10,000.00	9,895.35	39.68	35.58	52.14	419.38	-144.86	1,490.97	1,434.19	56.79	26.255	

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design: Sec 27-T25S-R31E - Lusitano 27_34 Fed Com 523H - Wellbore #1 - Permit Plan 1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.50 ft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	2.00	-2.00	0.50	0.50	-179.83	-149.98	-0.44	149.98					
50.00	50.00	48.00	48.00	0.50	0.50	-179.83	-149.98	-0.44	149.98	148.97	1.01	149.064		
100.00	100.00	102.00	98.00	0.52	0.52	-179.83	-149.98	-0.44	149.98	148.94	1.04	144.571		
150.00	150.00	148.00	148.00	0.59	0.59	-179.83	-149.98	-0.44	149.98	148.80	1.18	127.459		
200.00	200.00	202.00	198.00	0.70	0.71	-179.83	-149.98	-0.44	149.98	148.57	1.41	106.425		
250.00	250.00	248.00	248.00	0.84	0.83	-179.83	-149.98	-0.44	149.98	148.31	1.67	89.826		
300.00	300.00	302.00	298.00	0.99	0.99	-179.83	-149.98	-0.44	149.98	148.00	1.98	75.715		
350.00	350.00	348.00	348.00	1.15	1.14	-179.83	-149.98	-0.44	149.98	147.70	2.28	65.651		
400.00	400.00	402.00	398.00	1.31	1.32	-179.83	-149.98	-0.44	149.98	147.36	2.62	57.140		
450.00	450.00	448.00	448.00	1.48	1.47	-179.83	-149.98	-0.44	149.98	147.04	2.95	50.912		
500.00	500.00	502.00	498.00	1.65	1.65	-179.83	-149.98	-0.44	149.98	146.68	3.30	45.462		
550.00	550.00	548.00	548.00	1.82	1.81	-179.83	-149.98	-0.44	149.98	146.35	3.63	41.335		
600.00	600.00	602.00	598.00	1.99	2.00	-179.83	-149.98	-0.44	149.98	145.99	3.99	37.607		
650.00	650.00	648.00	648.00	2.16	2.16	-179.83	-149.98	-0.44	149.98	145.66	4.32	34.701		
700.00	700.00	702.00	698.00	2.34	2.35	-179.83	-149.98	-0.44	149.98	145.30	4.69	32.009		
750.00	750.00	748.00	748.00	2.51	2.51	-179.83	-149.98	-0.44	149.98	144.96	5.02	29.863		
800.00	800.00	802.00	798.00	2.69	2.70	-179.83	-149.98	-0.44	149.98	144.59	5.39	27.835		
850.00	850.00	848.00	848.00	2.87	2.86	-179.83	-149.98	-0.44	149.98	144.25	5.73	26.190		
900.00	900.00	902.00	898.00	3.04	3.05	-179.83	-149.98	-0.44	149.98	143.89	6.09	24.611		
950.00	950.00	948.00	948.00	3.22	3.21	-179.83	-149.98	-0.44	149.98	143.55	6.43	23.311		
1,000.00	1,000.00	1,002.00	998.00	3.40	3.40	-179.83	-149.98	-0.44	149.98	143.18	6.80	22.048		
1,050.00	1,050.00	1,048.00	1,048.00	3.58	3.57	-179.83	-149.98	-0.44	149.98	142.84	7.14	20.997		
1,100.00	1,100.00	1,102.00	1,098.00	3.75	3.76	-179.83	-149.98	-0.44	149.98	142.47	7.51	19.965		
1,150.00	1,150.00	1,148.00	1,148.00	3.93	3.92	-179.83	-149.98	-0.44	149.98	142.13	7.85	19.097		
1,200.00	1,200.00	1,202.00	1,198.00	4.11	4.12	-179.83	-149.98	-0.44	149.98	141.76	8.22	18.238		
1,250.00	1,250.00	1,248.00	1,248.00	4.29	4.28	-179.83	-149.98	-0.44	149.98	141.42	8.57	17.511		
1,300.00	1,300.00	1,302.00	1,298.00	4.46	4.47	-179.83	-149.98	-0.44	149.98	141.05	8.94	16.785		
1,350.00	1,350.00	1,348.00	1,348.00	4.64	4.64	-179.83	-149.98	-0.44	149.98	140.70	9.28	16.166		
1,400.00	1,400.00	1,402.00	1,398.00	4.82	4.83	-179.83	-149.98	-0.44	149.98	140.33	9.65	15.545		
1,450.00	1,450.00	1,448.00	1,448.00	5.00	4.99	-179.83	-149.98	-0.44	149.98	139.99	9.99	15.012		
1,500.00	1,500.00	1,502.00	1,498.00	5.18	5.18	-179.83	-149.98	-0.44	149.98	139.62	10.36	14.475		
1,550.00	1,550.00	1,548.00	1,548.00	5.36	5.35	-179.83	-149.98	-0.44	149.98	139.28	10.70	14.011		
1,600.00	1,600.00	1,602.00	1,598.00	5.53	5.54	-179.83	-149.98	-0.44	149.98	138.91	11.08	13.542		
1,650.00	1,650.00	1,648.00	1,648.00	5.71	5.71	-179.83	-149.98	-0.44	149.98	138.56	11.42	13.135		
1,700.00	1,700.00	1,702.00	1,698.00	5.89	5.90	-179.83	-149.98	-0.44	149.98	138.19	11.79	12.721		
1,750.00	1,750.00	1,748.00	1,748.00	6.07	6.06	-179.83	-149.98	-0.44	149.98	137.85	12.13	12.362		
1,800.00	1,800.00	1,802.00	1,798.00	6.25	6.26	-179.83	-149.98	-0.44	149.98	137.48	12.50	11.995		
1,850.00	1,850.00	1,848.00	1,848.00	6.43	6.42	-179.83	-149.98	-0.44	149.98	137.13	12.85	11.674		
1,900.00	1,900.00	1,902.00	1,898.00	6.61	6.61	-179.83	-149.98	-0.44	149.98	136.76	13.22	11.346		
1,950.00	1,950.00	1,948.00	1,948.00	6.78	6.78	-179.83	-149.98	-0.44	149.98	136.42	13.56	11.059		
2,000.00	2,000.00	2,002.00	1,998.00	6.96	6.97	-179.83	-149.98	-0.44	149.98	136.05	13.93	10.764		
2,050.00	2,050.00	2,048.00	2,048.00	7.14	7.13	-179.83	-149.98	-0.44	149.98	135.70	14.28	10.505		
2,100.00	2,100.00	2,102.00	2,098.00	7.32	7.33	-179.83	-149.98	-0.44	149.98	135.33	14.65	10.238		
2,150.00	2,150.00	2,148.00	2,148.00	7.50	7.49	-179.83	-149.98	-0.44	149.98	134.99	14.99	10.004		
2,200.00	2,200.00	2,202.00	2,198.00	7.68	7.69	-179.83	-149.98	-0.44	149.98	134.62	15.36	9.762		
2,250.00	2,250.00	2,248.00	2,248.00	7.86	7.85	-179.83	-149.98	-0.44	149.98	134.27	15.71	9.548		
2,300.00	2,300.00	2,302.00	2,298.00	8.04	8.04	-179.83	-149.98	-0.44	149.98	133.90	16.08	9.327		
2,350.00	2,350.00	2,348.00	2,348.00	8.22	8.21	-179.83	-149.98	-0.44	149.98	133.56	16.42	9.132		
2,400.00	2,400.00	2,402.00	2,398.00	8.39	8.40	-179.83	-149.98	-0.44	149.98	133.19	16.80	8.930		
2,450.00	2,450.00	2,448.00	2,448.00	8.57	8.57	-179.83	-149.98	-0.44	149.98	132.84	17.14	8.751		
2,500.00	2,500.00	2,502.00	2,498.00	8.75	8.76	-179.83	-149.98	-0.44	149.98	132.47	17.51	8.565		
2,550.00	2,550.00	2,548.00	2,548.00	8.93	8.92	-179.83	-149.98	-0.44	149.98	132.13	17.85	8.400		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design Sec 27-T25S-R31E - Lusitano 27 34 Fed Com 523H - Wellbore #1 - Permit Plan 1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.50 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre N-S (ft)	Offset Wellbore Centre E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
2,600.00	2,600.00	2,602.00	2,598.00	9.11	9.12	-179.83	-149.98	-0.44	149.98	131.75	18.23	8.228			
2,650.00	2,650.00	2,648.00	2,648.00	9.29	9.28	-179.83	-149.98	-0.44	149.98	131.41	18.57	8.076			
2,700.00	2,700.00	2,702.00	2,698.00	9.47	9.48	-179.83	-149.98	-0.44	149.98	131.04	18.94	7.918			
2,750.00	2,750.00	2,748.00	2,748.00	9.65	9.64	-179.83	-149.98	-0.44	149.98	130.69	19.29	7.776			
2,800.00	2,800.00	2,802.00	2,798.00	9.83	9.83	-179.83	-149.98	-0.44	149.98	130.32	19.66	7.629			
2,850.00	2,850.00	2,848.00	2,848.00	10.00	10.00	-179.83	-149.98	-0.44	149.98	129.98	20.00	7.498			
2,900.00	2,900.00	2,902.00	2,898.00	10.18	10.19	-179.83	-149.98	-0.44	149.98	129.61	20.37	7.361			
2,950.00	2,950.00	2,948.00	2,948.00	10.36	10.36	-179.83	-149.98	-0.44	149.98	129.26	20.72	7.239			
3,000.00	3,000.00	3,002.00	2,998.00	10.54	10.55	-179.83	-149.98	-0.44	149.98	128.89	21.09	7.111			
3,050.00	3,050.00	3,048.00	3,048.00	10.72	10.71	-179.83	-149.98	-0.44	149.98	128.55	21.43	6.997			
3,100.00	3,100.00	3,102.00	3,098.00	10.90	10.91	-179.83	-149.98	-0.44	149.98	128.17	21.81	6.878			
3,150.00	3,150.00	3,148.00	3,148.00	11.08	11.07	-179.83	-149.98	-0.44	149.98	127.83	22.15	6.771			
3,200.00	3,200.00	3,202.00	3,198.00	11.26	11.27	-179.83	-149.98	-0.44	149.98	127.46	22.52	6.659			
3,250.00	3,250.00	3,248.00	3,248.00	11.44	11.43	-179.83	-149.98	-0.44	149.98	127.11	22.87	6.559			
3,300.00	3,300.00	3,302.00	3,298.00	11.62	11.62	-179.83	-149.98	-0.44	149.98	126.74	23.24	6.454			
3,350.00	3,350.00	3,348.00	3,348.00	11.80	11.79	-179.83	-149.98	-0.44	149.98	126.40	23.58	6.360			
3,400.00	3,400.00	3,402.00	3,398.00	11.97	11.98	-179.83	-149.98	-0.44	149.98	126.02	23.96	6.261			
3,450.00	3,450.00	3,448.00	3,448.00	12.15	12.15	-179.83	-149.98	-0.44	149.98	125.68	24.30	6.172			
3,500.00	3,500.00	3,502.00	3,498.00	12.33	12.34	-179.83	-149.98	-0.44	149.98	125.31	24.67	6.079			
3,550.00	3,550.00	3,548.00	3,548.00	12.51	12.50	-179.83	-149.98	-0.44	149.98	124.96	25.02	5.995			
3,600.00	3,600.00	3,602.00	3,598.00	12.69	12.70	-179.83	-149.98	-0.44	149.98	124.59	25.39	5.907			
3,650.00	3,650.00	3,648.00	3,648.00	12.87	12.86	-179.83	-149.98	-0.44	149.98	124.25	25.73	5.828			
3,700.00	3,700.00	3,702.00	3,698.00	13.05	13.06	-179.83	-149.98	-0.44	149.98	123.88	26.11	5.745			
3,750.00	3,750.00	3,748.00	3,748.00	13.23	13.22	-179.83	-149.98	-0.44	149.98	123.53	26.45	5.671			
3,800.00	3,800.00	3,802.00	3,798.00	13.41	13.41	-179.83	-149.98	-0.44	149.98	123.16	26.82	5.592			
3,850.00	3,850.00	3,848.00	3,848.00	13.59	13.58	-179.83	-149.98	-0.44	149.98	122.82	27.17	5.521			
3,900.00	3,900.00	3,902.00	3,898.00	13.77	13.77	-179.83	-149.98	-0.44	149.98	122.44	27.54	5.446			
3,950.00	3,950.00	3,948.00	3,948.00	13.94	13.94	-179.83	-149.98	-0.44	149.98	122.10	27.88	5.379			
4,000.00	4,000.00	4,002.00	3,998.00	14.12	14.13	-179.83	-149.98	-0.44	149.98	121.73	28.25	5.308			
4,050.00	4,050.00	4,048.00	4,048.00	14.30	14.30	-179.83	-149.98	-0.44	149.98	121.38	28.60	5.244			
4,100.00	4,100.00	4,102.00	4,098.00	14.48	14.49	-179.83	-149.98	-0.44	149.98	121.01	28.97	5.177			
4,150.00	4,150.00	4,148.00	4,148.00	14.66	14.65	-179.83	-149.98	-0.44	149.98	120.67	29.31	5.116			
4,200.00	4,200.00	4,202.00	4,198.00	14.84	14.85	-179.83	-149.98	-0.44	149.98	120.29	29.69	5.052			
4,250.00	4,250.00	4,248.00	4,248.00	15.02	15.01	-179.83	-149.98	-0.44	149.98	119.95	30.03	4.994 Alert			
4,300.00	4,300.00	4,302.00	4,298.00	15.20	15.21	-179.83	-149.98	-0.44	149.98	119.58	30.40	4.933 Alert			
4,350.00	4,350.00	4,348.00	4,348.00	15.38	15.37	-179.83	-149.98	-0.44	149.98	119.23	30.75	4.878 Alert			
4,400.00	4,400.00	4,402.00	4,398.00	15.56	15.56	-179.83	-149.98	-0.44	149.98	118.86	31.12	4.819 Alert			
4,450.00	4,450.00	4,448.00	4,448.00	15.74	15.73	-179.83	-149.98	-0.44	149.98	118.52	31.46	4.767 Alert			
4,500.00	4,500.00	4,498.00	4,498.00	15.92	15.91	-179.83	-149.98	-0.44	149.98	118.16	31.82	4.713 Alert			
4,550.00	4,550.00	4,548.28	4,548.28	16.09	16.08	93.64	-149.94	-0.24	149.95	117.78	32.17	4.661 Alert			
4,600.00	4,600.00	4,598.57	4,598.57	16.26	16.26	93.65	-149.80	0.39	149.85	117.32	32.53	4.607 Alert			
4,650.00	4,649.98	4,648.86	4,648.84	16.44	16.43	93.67	-149.56	1.45	149.68	116.81	32.87	4.554 Alert			
4,700.00	4,699.96	4,699.15	4,699.11	16.61	16.61	93.69	-149.23	2.94	149.44	116.23	33.22	4.499 Alert			
4,750.00	4,749.92	4,749.44	4,749.36	16.78	16.78	93.71	-148.80	4.86	149.13	115.57	33.56	4.444 Alert			
4,800.00	4,799.86	4,799.73	4,799.59	16.95	16.96	93.74	-148.27	7.21	148.76	114.85	33.91	4.387 Alert			
4,850.00	4,849.78	4,850.02	4,849.80	17.12	17.13	93.77	-147.65	9.99	148.31	114.06	34.25	4.330 Alert			
4,900.00	4,899.68	4,900.31	4,899.98	17.30	17.31	93.80	-146.93	13.20	147.80	113.20	34.60	4.272 Alert			
4,950.00	4,949.54	4,950.59	4,950.13	17.47	17.48	93.84	-146.12	16.84	147.21	112.27	34.95	4.213 Alert			
5,000.00	4,999.37	5,000.88	5,000.24	17.64	17.66	93.88	-145.21	20.91	146.56	111.26	35.29	4.153 Alert			
5,050.00	5,049.16	5,051.16	5,050.31	17.82	17.83	93.93	-144.20	25.41	145.83	110.19	35.64	4.092 Alert			
5,100.00	5,098.90	5,101.44	5,100.34	17.99	18.01	93.98	-143.10	30.34	145.04	109.05	35.99	4.030 Alert			
5,150.00	5,148.61	5,151.72	5,150.32	18.16	18.19	94.02	-141.91	35.69	144.18	107.84	36.34	3.968 Alert			

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.50 ft
Reference															
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi-Major Axis (ft)	Highside Footage (ft)	Offset Wellbore Centre (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
5,200.00	5,198.30	5,202.00	5,200.24	18.34	18.36	93.93	-140.61	41.48	143.23	106.54	36.69	3.904	Alert		
5,250.00	5,247.99	5,252.26	5,250.10	18.52	18.54	93.67	-139.23	47.69	142.18	105.14	37.04	3.838	Alert		
5,300.00	5,297.69	5,302.46	5,299.84	18.69	18.72	93.23	-137.75	54.30	141.04	103.64	37.40	3.772	Alert		
5,350.00	5,347.38	5,352.43	5,349.33	18.87	18.90	92.73	-136.24	61.03	139.88	102.13	37.75	3.705	Alert		
5,400.00	5,397.07	5,402.40	5,398.82	19.04	19.07	92.22	-134.74	67.76	138.73	100.62	38.11	3.641	Alert		
5,450.00	5,446.77	5,452.37	5,448.32	19.22	19.25	91.70	-133.24	74.49	137.59	99.13	38.46	3.577	Alert		
5,500.00	5,496.46	5,502.34	5,497.81	19.40	19.43	91.17	-131.73	81.22	136.46	97.64	38.82	3.515	Alert		
5,550.00	5,546.15	5,552.31	5,547.30	19.58	19.61	90.64	-130.23	87.95	135.35	96.17	39.18	3.455	Alert		
5,600.00	5,595.84	5,602.28	5,596.80	19.75	19.79	90.09	-128.72	94.68	134.24	94.71	39.54	3.395	Alert		
5,650.00	5,645.54	5,652.26	5,646.29	19.93	19.97	89.54	-127.22	101.41	133.15	93.26	39.90	3.337	Alert		
5,700.00	5,695.23	5,702.23	5,695.78	20.11	20.15	88.98	-125.72	108.14	132.07	91.82	40.26	3.281	Alert		
5,750.00	5,744.92	5,752.20	5,745.28	20.29	20.33	88.40	-124.21	114.87	131.01	90.39	40.62	3.225	Alert		
5,800.00	5,794.62	5,802.17	5,794.77	20.47	20.52	87.82	-122.71	121.60	129.96	88.98	40.98	3.171	Alert		
5,850.00	5,844.31	5,852.14	5,844.26	20.65	20.70	87.23	-121.21	128.33	128.92	87.58	41.34	3.118	Alert		
5,900.00	5,894.00	5,902.11	5,893.76	20.83	20.88	86.63	-119.70	135.06	127.89	86.19	41.70	3.067	Alert		
5,950.00	5,943.69	5,952.08	5,943.25	21.01	21.06	86.02	-118.20	141.79	126.88	84.82	42.07	3.016	Alert		
6,000.00	5,993.39	6,002.06	5,992.74	21.19	21.25	85.40	-116.69	148.52	125.89	83.46	42.43	2.967	Alert		
6,050.00	6,043.08	6,052.03	6,042.24	21.37	21.43	84.77	-115.19	155.25	124.91	82.11	42.79	2.919	Alert		
6,100.00	6,092.77	6,102.00	6,091.73	21.55	21.61	84.13	-113.69	161.98	123.94	80.78	43.16	2.872	Alert		
6,150.00	6,142.47	6,151.97	6,141.22	21.73	21.80	83.48	-112.18	168.71	122.99	79.47	43.52	2.826	Alert		
6,200.00	6,192.16	6,201.94	6,190.72	21.91	21.98	82.82	-110.68	175.43	122.06	78.17	43.89	2.781	Alert		
6,250.00	6,241.85	6,251.91	6,240.21	22.09	22.17	82.15	-109.17	182.16	121.14	76.89	44.25	2.737	Alert		
6,300.00	6,291.54	6,301.88	6,289.70	22.27	22.35	81.47	-107.67	188.89	120.24	75.62	44.62	2.695	Alert		
6,350.00	6,341.24	6,351.86	6,339.20	22.46	22.54	80.78	-106.17	195.62	119.36	74.37	44.98	2.653	Alert		
6,400.00	6,390.93	6,401.83	6,388.69	22.64	22.73	80.08	-104.66	202.35	118.49	73.14	45.35	2.613	Alert		
6,450.00	6,440.62	6,451.80	6,438.18	22.82	22.91	79.37	-103.16	209.08	117.64	71.93	45.72	2.573	Alert		
6,500.00	6,490.32	6,501.77	6,487.68	23.00	23.10	78.65	-101.66	215.81	116.81	70.73	46.08	2.535	Alert		
6,550.00	6,540.01	6,551.74	6,537.17	23.19	23.28	77.92	-100.15	222.54	116.00	69.55	46.45	2.497	Minor Risk		
6,600.00	6,589.70	6,601.71	6,586.66	23.37	23.47	77.18	-98.65	229.27	115.21	68.39	46.82	2.461	Minor Risk		
6,650.00	6,639.39	6,651.68	6,636.16	23.55	23.66	76.43	-97.14	236.00	114.44	67.26	47.18	2.425	Minor Risk		
6,700.00	6,689.09	6,701.65	6,685.65	23.73	23.85	75.67	-95.64	242.73	113.69	66.14	47.55	2.391	Minor Risk		
6,750.00	6,738.78	6,751.63	6,735.14	23.92	24.03	74.90	-94.14	249.46	112.95	65.04	47.92	2.357	Minor Risk		
6,800.00	6,788.47	6,801.60	6,784.64	24.10	24.22	74.12	-92.63	256.19	112.24	63.96	48.28	2.325	Minor Risk		
6,850.00	6,838.17	6,851.57	6,834.13	24.29	24.41	73.33	-91.13	262.92	111.55	62.90	48.65	2.293	Minor Risk		
6,900.00	6,887.86	6,901.54	6,883.62	24.47	24.60	72.53	-89.63	269.65	110.88	61.87	49.01	2.262	Minor Risk		
6,950.00	6,937.55	6,951.51	6,933.12	24.65	24.79	71.72	-88.12	276.38	110.24	60.86	49.38	2.232	Minor Risk		
7,000.00	6,987.24	7,001.48	6,982.61	24.84	24.98	70.90	-86.62	283.11	109.61	59.87	49.75	2.203	Minor Risk		
7,050.00	7,036.94	7,051.45	7,032.10	25.02	25.17	70.07	-85.11	289.84	109.01	58.90	50.11	2.175	Minor Risk		
7,100.00	7,086.63	7,101.43	7,081.60	25.21	25.36	69.23	-83.61	296.57	108.43	57.96	50.48	2.148	Minor Risk		
7,150.00	7,136.32	7,151.40	7,131.09	25.39	25.54	68.39	-82.11	303.29	107.88	57.04	50.84	2.122	Minor Risk		
7,200.00	7,186.02	7,201.37	7,180.58	25.58	25.73	67.53	-80.60	310.02	107.35	56.14	51.21	2.096	Minor Risk		
7,250.00	7,235.71	7,251.34	7,230.08	25.76	25.92	66.67	-79.10	316.75	106.84	55.27	51.57	2.072	Minor Risk		
7,300.00	7,285.40	7,301.40	7,279.66	25.95	26.11	65.81	-77.60	323.48	106.35	54.42	51.93	2.048	Minor Risk		
7,350.00	7,335.09	7,351.75	7,329.60	26.13	26.30	65.18	-76.19	329.79	105.76	53.46	52.30	2.022	Minor Risk		
7,400.00	7,384.79	7,402.13	7,379.63	26.32	26.49	64.89	-74.92	335.45	105.00	52.32	52.68	1.993	Minor Risk		
7,450.00	7,434.48	7,452.50	7,429.74	26.50	26.68	64.94	-73.80	340.48	104.06	51.01	53.05	1.962	Minor Risk		
7,500.00	7,484.17	7,502.85	7,479.89	26.69	26.87	65.35	-72.82	344.85	102.94	49.51	53.42	1.927	Minor Risk		
7,550.00	7,533.86	7,553.17	7,530.06	26.87	27.05	66.14	-71.99	348.58	101.65	47.85	53.80	1.889	Minor Risk		
7,600.00	7,583.56	7,603.43	7,580.23	27.06	27.23	67.30	-71.30	351.66	100.22	46.05	54.18	1.850	Minor Risk		
7,650.00	7,633.25	7,653.63	7,630.36	27.25	27.41	68.88	-70.75	354.10	98.70	44.15	54.56	1.809	Minor Risk		
7,700.00	7,682.94	7,703.73	7,680.43	27.43	27.59	70.88	-70.36	355.88	97.14	42.20	54.94	1.768	Minor Risk		
7,750.00	7,732.64	7,753.73	7,730.42	27.62	27.77	73.32	-70.10	357.03	95.61	40.29	55.32	1.728	Minor Risk		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.50 ft
Reference: Sec 27-T25S-R31E - Lusitano 27-34 Fed Com 523H - Wellbore #1 - Permit Plan 1															
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre N/S (ft)	Offset Wellbore Centre E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
7,800.00	7,782.33	7,803.62	7,780.30	27.81	27.94	76.23	-69.99	357.53	94.21	38.51	55.70	1.691	Minor Risk		
7,850.00	7,832.02	7,853.34	7,830.02	27.99	28.12	79.51	-69.98	357.56	93.04	36.96	56.08	1.659	Minor Risk		
7,900.00	7,881.71	7,903.03	7,879.71	28.18	28.29	82.87	-69.98	357.56	92.19	35.73	56.45	1.633	Minor Risk		
7,950.00	7,931.41	7,952.72	7,929.41	28.37	28.47	86.29	-69.98	357.56	91.66	34.84	56.82	1.613	Minor Risk		
8,000.00	7,981.10	8,002.42	7,979.10	28.55	28.64	89.73	-69.98	357.56	91.47	34.28	57.19	1.599	Minor Risk		
8,003.99	7,985.07	8,006.38	7,983.07	28.57	28.65	90.00	-69.98	357.56	91.46	34.25	57.22	1.599	Minor Risk, CC		
8,050.00	8,030.79	8,052.11	8,028.79	28.74	28.81	93.17	-69.98	357.56	91.61	34.06	57.55	1.592	Minor Risk, ES		
8,100.00	8,080.49	8,101.80	8,078.49	28.93	28.99	96.59	-69.98	357.56	92.08	34.18	57.90	1.580	Minor Risk, SF		
8,150.00	8,130.18	8,151.49	8,128.18	29.11	29.16	99.96	-69.98	357.56	92.88	34.64	58.25	1.595	Minor Risk		
8,200.00	8,179.87	8,196.60	8,173.27	29.30	29.32	102.89	-70.68	357.56	94.80	36.32	58.48	1.621	Minor Risk		
8,250.00	8,229.56	8,239.01	8,215.51	29.49	29.45	105.17	-74.33	357.57	100.40	41.94	58.45	1.718	Minor Risk		
8,300.00	8,279.26	8,280.61	8,256.58	29.68	29.58	106.80	-80.94	357.58	109.68	51.48	58.21	1.884	Minor Risk		
8,350.00	8,328.95	8,321.01	8,295.90	29.86	29.71	107.78	-90.20	357.59	122.43	64.65	57.77	2.119	Minor Risk		
8,400.00	8,378.64	8,359.88	8,333.02	30.05	29.82	108.24	-101.69	357.61	138.39	81.20	57.18	2.420	Minor Risk		
8,450.00	8,428.34	8,396.97	8,367.64	30.24	29.93	108.33	-114.99	357.63	157.33	100.88	56.46	2.787	Alert		
8,500.00	8,478.03	8,432.11	8,399.58	30.43	30.02	108.18	-129.62	357.65	179.05	123.42	55.63	3.219	Alert		
8,550.00	8,527.72	8,465.20	8,428.78	30.62	30.11	107.88	-145.17	357.68	203.31	148.58	54.73	3.715	Alert		
8,600.00	8,577.41	8,496.22	8,455.31	30.80	30.19	107.51	-161.26	357.70	229.90	176.12	53.77	4.275	Alert		
8,650.00	8,627.11	8,525.20	8,479.26	30.99	30.26	107.11	-177.56	357.73	258.60	205.80	52.80	4.898	Alert		
8,700.00	8,676.80	8,550.00	8,499.08	31.18	30.32	106.74	-192.45	357.75	289.23	237.61	51.62	5.603			
8,750.00	8,726.49	8,577.28	8,520.12	31.37	30.37	106.31	-209.81	357.78	321.56	270.69	50.87	6.322			
8,800.00	8,776.19	8,600.00	8,537.00	31.56	30.42	105.95	-225.03	357.80	355.45	305.56	49.89	7.125			
8,850.00	8,825.88	8,622.21	8,552.90	31.74	30.47	105.59	-240.53	357.83	390.74	341.68	49.05	7.966			
8,900.00	8,875.57	8,642.28	8,566.74	31.93	30.51	105.27	-255.06	357.85	427.27	379.06	48.21	8.863			
8,950.00	8,925.26	8,660.91	8,579.13	32.12	30.54	104.98	-268.98	357.87	464.92	417.51	47.41	9.807			
9,000.00	8,974.96	8,678.22	8,590.23	32.31	30.57	104.71	-282.26	357.89	503.57	456.91	46.65	10.793			
9,050.00	9,024.65	8,700.00	8,603.61	32.50	30.62	104.37	-299.44	357.92	543.18	496.86	46.31	11.728			
9,100.00	9,074.34	8,700.00	8,603.61	32.69	30.62	104.37	-299.44	357.92	583.62	538.81	44.81	13.024			
9,150.00	9,124.04	8,723.25	8,617.17	32.88	30.66	104.02	-318.33	357.95	624.56	579.82	44.74	13.960			
9,200.00	9,173.73	8,736.27	8,624.43	33.07	30.69	103.82	-329.14	357.97	666.30	622.11	44.19	15.077			
9,250.00	9,223.42	8,750.00	8,631.81	33.25	30.72	103.62	-340.71	357.98	708.63	664.86	43.77	16.190			
9,300.00	9,273.11	8,750.00	8,631.81	33.44	30.72	103.62	-340.71	357.98	751.64	708.83	42.81	17.557			
9,350.00	9,322.81	8,770.48	8,642.29	33.63	30.76	103.32	-358.30	358.01	794.84	752.02	42.82	18.561			
9,400.00	9,372.50	8,780.48	8,647.19	33.82	30.78	103.18	-367.02	358.02	838.63	796.19	42.44	19.759			
9,450.00	9,422.19	8,800.00	8,656.29	34.01	30.82	102.91	-384.29	358.05	882.96	840.49	42.47	20.788			
9,500.00	9,471.89	8,800.00	8,656.29	34.20	30.82	102.91	-384.29	358.05	927.37	885.54	41.84	22.167			
9,550.00	9,521.58	8,800.00	8,656.29	34.39	30.82	102.91	-384.29	358.05	972.33	931.05	41.28	23.554			
9,600.00	9,571.27	8,814.89	8,662.84	34.58	30.86	102.71	-397.65	358.07	1,017.45	976.19	41.26	24.660			
9,650.00	9,620.96	8,822.30	8,665.97	34.77	30.88	102.61	-404.38	358.08	1,062.92	1,021.89	41.03	25.904			
9,700.00	9,670.66	8,829.31	8,668.85	34.96	30.89	102.52	-410.77	358.09	1,108.65	1,067.82	40.83	27.151			
9,750.00	9,720.35	8,850.00	8,676.89	35.15	30.95	102.25	-429.83	358.12	1,154.87	1,113.84	41.03	28.144			
9,800.00	9,770.04	8,850.00	8,676.89	35.34	30.95	102.25	-429.83	358.12	1,200.88	1,160.18	40.70	29.507			
9,850.00	9,819.74	8,850.00	8,676.89	35.53	30.95	102.71	-429.83	358.12	1,247.19	1,206.79	40.41	30.867			
9,900.00	9,869.48	8,850.00	8,676.89	35.72	30.95	104.57	-429.83	358.12	1,293.74	1,253.59	40.15	32.223			
9,950.00	9,919.29	8,850.00	8,676.89	35.90	30.95	106.47	-429.83	358.12	1,340.48	1,300.56	39.92	33.575			
10,000.00	9,969.15	8,850.00	8,676.89	36.09	30.95	108.41	-429.83	358.12	1,387.38	1,347.66	39.73	34.923			
10,050.00	10,019.05	8,869.47	8,683.82	36.27	31.00	109.80	-448.02	358.15	1,433.97	1,394.02	39.95	35.896			
10,100.00	10,068.99	8,874.21	8,685.42	36.45	31.01	111.56	-452.48	358.16	1,480.89	1,441.02	39.87	37.140			

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

Anticollision Report

Company:	WCDSC Permian NM	Local/Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD-Reference:	Offset Datum

Offset Design Sec 27-T25S-R31E - Lusitano 27_34 Fed Com 534H - Wellbore #1 - Permit Plan 1													Offset Site Error:	0.00 h
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.50 h
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre N/S (ft)	Offset Wellbore Centre E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	2.60	-2.60	0.50	0.50	168.86	-149.80	29.51	152.68					
50.00	50.00	47.40	47.40	0.50	0.50	168.86	-149.80	29.51	152.68	151.67	1.01	151.762		
100.00	100.00	102.60	97.40	0.52	0.52	168.86	-149.80	29.51	152.68	151.64	1.04	147.089		
150.00	150.00	147.40	147.40	0.59	0.59	168.86	-149.80	29.51	152.68	151.50	1.18	129.875		
200.00	200.00	202.60	197.40	0.70	0.71	168.86	-149.80	29.51	152.68	151.27	1.41	108.223		
250.00	250.00	247.40	247.40	0.84	0.83	168.86	-149.80	29.51	152.68	151.01	1.67	91.536		
300.00	300.00	302.60	297.40	0.99	1.00	168.86	-149.80	29.51	152.68	150.70	1.98	77.005		
350.00	350.00	347.40	347.40	1.15	1.14	168.86	-149.80	29.51	152.68	150.40	2.28	66.888		
400.00	400.00	402.60	397.40	1.31	1.32	168.86	-149.80	29.51	152.68	150.05	2.63	58.124		
450.00	450.00	447.40	447.40	1.48	1.47	168.86	-149.80	29.51	152.68	149.74	2.94	51.863		
500.00	500.00	502.60	497.40	1.65	1.65	168.86	-149.80	29.51	152.68	149.38	3.30	46.252		
550.00	550.00	547.40	547.40	1.82	1.81	168.86	-149.80	29.51	152.68	149.05	3.63	42.102		
600.00	600.00	602.60	597.40	1.99	2.00	168.86	-149.80	29.51	152.68	148.69	3.99	38.263		
650.00	650.00	647.40	647.40	2.16	2.16	168.86	-149.80	29.51	152.68	148.36	4.32	35.342		
700.00	700.00	702.60	697.40	2.34	2.35	168.86	-149.80	29.51	152.68	147.99	4.69	32.570		
750.00	750.00	747.40	747.40	2.51	2.51	168.86	-149.80	29.51	152.68	147.66	5.02	30.413		
800.00	800.00	802.60	797.40	2.69	2.70	168.86	-149.80	29.51	152.68	147.29	5.39	28.325		
850.00	850.00	847.40	847.40	2.87	2.86	168.86	-149.80	29.51	152.68	146.95	5.72	26.671		
900.00	900.00	902.60	897.40	3.04	3.05	168.86	-149.80	29.51	152.68	146.58	6.10	25.045		
950.00	950.00	947.40	947.40	3.22	3.21	168.86	-149.80	29.51	152.68	146.25	6.43	23.738		
1,000.00	1,000.00	1,002.60	997.40	3.40	3.41	168.86	-149.80	29.51	152.68	145.87	6.80	22.438		
1,050.00	1,050.00	1,047.40	1,047.40	3.58	3.57	168.86	-149.80	29.51	152.68	145.54	7.14	21.381		
1,100.00	1,100.00	1,102.60	1,097.40	3.75	3.76	168.86	-149.80	29.51	152.68	145.16	7.51	20.318		
1,150.00	1,150.00	1,147.40	1,147.40	3.93	3.92	168.86	-149.80	29.51	152.68	144.83	7.85	19.446		
1,200.00	1,200.00	1,202.60	1,197.40	4.11	4.12	168.86	-149.80	29.51	152.68	144.45	8.23	18.562		
1,250.00	1,250.00	1,247.40	1,247.40	4.29	4.28	168.86	-149.80	29.51	152.68	144.12	8.56	17.830		
1,300.00	1,300.00	1,302.60	1,297.40	4.46	4.47	168.86	-149.80	29.51	152.68	143.74	8.94	17.083		
1,350.00	1,350.00	1,347.40	1,347.40	4.64	4.63	168.86	-149.80	29.51	152.68	143.40	9.28	16.461		
1,400.00	1,400.00	1,402.60	1,397.40	4.82	4.83	168.86	-149.80	29.51	152.68	143.03	9.65	15.821		
1,450.00	1,450.00	1,447.40	1,447.40	5.00	4.99	168.86	-149.80	29.51	152.68	142.69	9.99	15.286		
1,500.00	1,500.00	1,502.60	1,497.40	5.18	5.19	168.86	-149.80	29.51	152.68	142.32	10.36	14.732		
1,550.00	1,550.00	1,547.40	1,547.40	5.36	5.35	168.86	-149.80	29.51	152.68	141.98	10.70	14.266		
1,600.00	1,600.00	1,602.60	1,597.40	5.53	5.54	168.86	-149.80	29.51	152.68	141.60	11.08	13.783		
1,650.00	1,650.00	1,647.40	1,647.40	5.71	5.70	168.86	-149.80	29.51	152.68	141.26	11.42	13.374		
1,700.00	1,700.00	1,702.60	1,697.40	5.89	5.90	168.86	-149.80	29.51	152.68	140.89	11.79	12.948		
1,750.00	1,750.00	1,747.40	1,747.40	6.07	6.06	168.86	-149.80	29.51	152.68	140.55	12.13	12.587		
1,800.00	1,800.00	1,802.60	1,797.40	6.25	6.26	168.86	-149.80	29.51	152.68	140.17	12.51	12.208		
1,850.00	1,850.00	1,847.40	1,847.40	6.43	6.42	168.86	-149.80	29.51	152.68	139.83	12.85	11.886		
1,900.00	1,900.00	1,902.60	1,897.40	6.61	6.62	168.86	-149.80	29.51	152.68	139.46	13.22	11.548		
1,950.00	1,950.00	1,947.40	1,947.40	6.78	6.78	168.86	-149.80	29.51	152.68	139.12	13.56	11.260		
2,000.00	2,000.00	1,997.40	1,997.40	6.96	6.95	168.86	-149.80	29.51	152.68	138.76	13.92	10.970		
2,050.00	2,050.00	2,047.67	2,047.67	7.14	7.13	168.78	-149.72	29.69	152.64	138.36	14.27	10.694		
2,100.00	2,100.00	2,097.95	2,097.95	7.32	7.31	168.55	-149.47	30.28	152.50	137.87	14.63	10.424		
2,150.00	2,150.00	2,148.22	2,148.20	7.50	7.48	168.15	-149.03	31.27	152.28	137.30	14.98	10.163		
2,200.00	2,200.00	2,198.46	2,198.42	7.68	7.66	167.59	-148.43	32.66	151.98	136.64	15.34	9.910		
2,250.00	2,250.00	2,248.67	2,248.59	7.86	7.83	166.86	-147.64	34.46	151.61	135.92	15.69	9.663		
2,300.00	2,300.00	2,298.84	2,298.71	8.04	8.01	165.97	-146.69	36.65	151.20	135.16	16.05	9.423		
2,350.00	2,350.00	2,348.97	2,348.76	8.22	8.19	164.91	-145.55	39.25	150.76	134.36	16.40	9.193		
2,400.00	2,400.00	2,399.04	2,398.72	8.39	8.36	163.68	-144.25	42.24	150.31	133.56	16.75	8.971		
2,450.00	2,450.00	2,449.06	2,448.60	8.57	8.54	162.28	-142.77	45.63	149.89	132.78	17.11	8.760		
2,500.00	2,500.00	2,499.00	2,498.37	8.75	8.71	160.70	-141.12	49.41	149.52	132.05	17.47	8.561		
2,550.00	2,550.00	2,548.87	2,548.03	8.93	8.89	158.96	-139.30	53.59	149.25	131.43	17.82	8.375		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toeface (ft)	Offset Wellbore Centre -N/S (ft)	Offset Wellbore Centre -E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
2,600.00	2,600.00	2,598.66	2,597.57	9.11	9.07	157.05	-137.31	58.15	149.11	130.94	18.18	8.203			
2,615.21	2,615.21	2,613.78	2,612.61	9.16	9.12	156.43	-136.67	59.61	149.10	130.82	18.29	8.154 CC			
2,650.00	2,650.00	2,648.35	2,646.97	9.29	9.25	154.97	-135.15	63.10	149.15	130.62	18.53	8.047			
2,700.00	2,700.00	2,697.95	2,696.22	9.47	9.42	152.74	-132.83	68.43	149.42	130.53	18.89	7.910 ES			
2,750.00	2,750.00	2,747.44	2,745.32	9.65	9.60	150.37	-130.34	74.13	149.96	130.71	19.25	7.792			
2,800.00	2,800.00	2,796.82	2,794.25	9.83	9.78	147.86	-127.68	80.21	150.82	131.22	19.60	7.695			
2,850.00	2,850.00	2,846.08	2,843.01	10.00	9.96	145.24	-124.87	86.67	152.06	132.11	19.96	7.620			
2,900.00	2,900.00	2,895.22	2,891.58	10.18	10.14	142.51	-121.90	93.48	153.73	133.42	20.31	7.570			
2,950.00	2,950.00	2,944.59	2,940.35	10.36	10.33	139.76	-118.82	100.54	155.81	135.14	20.66	7.541			
3,000.00	3,000.00	3,006.02	2,999.13	10.54	10.56	137.09	-115.74	107.60	158.25	137.19	21.06	7.514			
3,050.00	3,050.00	3,043.37	3,037.92	10.72	10.70	134.49	-112.66	114.67	161.03	139.66	21.37	7.536			
3,100.00	3,100.00	3,107.25	3,086.70	10.90	10.93	131.99	-109.58	121.73	164.13	142.36	21.77	7.538			
3,150.00	3,150.00	3,142.14	3,135.48	11.08	11.07	129.59	-106.50	128.79	167.54	145.47	22.07	7.590			
3,200.00	3,200.00	3,208.47	3,184.27	11.26	11.32	127.28	-103.42	135.85	171.24	148.75	22.49	7.615			
3,250.00	3,250.00	3,240.92	3,233.05	11.44	11.44	125.07	-100.33	142.91	175.20	152.43	22.78	7.692			
3,300.00	3,300.00	3,309.69	3,281.83	11.62	11.70	122.96	-97.25	149.97	179.42	156.22	23.20	7.734			
3,350.00	3,350.00	3,339.69	3,330.62	11.80	11.82	120.95	-94.17	157.03	183.88	160.40	23.48	7.832			
3,400.00	3,400.00	3,389.08	3,379.40	11.97	12.01	119.04	-91.09	164.10	188.55	164.72	23.83	7.912			
3,450.00	3,450.00	3,438.47	3,428.18	12.15	12.20	117.21	-88.01	171.16	193.42	169.24	24.18	7.999			
3,500.00	3,500.00	3,487.86	3,476.97	12.33	12.39	115.48	-84.93	178.22	198.48	173.94	24.53	8.090			
3,550.00	3,550.00	3,537.25	3,525.75	12.51	12.58	113.84	-81.85	185.28	203.71	178.83	24.88	8.186			
3,600.00	3,600.00	3,586.63	3,574.53	12.69	12.77	112.27	-78.77	192.34	209.10	183.87	25.24	8.286			
3,650.00	3,650.00	3,636.02	3,623.32	12.87	12.96	110.79	-75.69	199.40	214.64	189.05	25.59	8.389			
3,700.00	3,700.00	3,685.41	3,672.10	13.05	13.15	109.38	-72.61	206.46	220.32	194.38	25.94	8.494			
3,750.00	3,750.00	3,734.80	3,720.88	13.23	13.35	108.04	-69.53	213.53	226.12	199.83	26.29	8.601			
3,800.00	3,800.00	3,784.19	3,769.67	13.41	13.54	106.77	-66.45	220.59	232.04	205.40	26.64	8.709			
3,850.00	3,850.00	3,833.57	3,818.45	13.59	13.73	105.56	-63.37	227.65	238.07	211.08	27.00	8.819			
3,900.00	3,900.00	3,882.96	3,867.23	13.77	13.93	104.41	-60.29	234.71	244.20	216.85	27.35	8.929			
3,950.00	3,950.00	3,932.35	3,916.02	13.94	14.12	103.31	-57.21	241.77	250.42	222.72	27.70	9.040			
4,000.00	4,000.00	3,981.74	3,964.80	14.12	14.31	102.27	-54.13	248.83	256.73	228.68	28.06	9.151			
4,050.00	4,050.00	4,031.13	4,013.58	14.30	14.51	101.28	-51.05	255.90	263.12	234.71	28.41	9.262			
4,100.00	4,100.00	4,080.51	4,062.37	14.48	14.70	100.34	-47.97	262.96	269.58	240.82	28.76	9.373			
4,150.00	4,150.00	4,129.90	4,111.15	14.66	14.90	99.44	-44.89	270.02	276.11	247.00	29.12	9.483			
4,200.00	4,200.00	4,179.29	4,159.93	14.84	15.10	98.58	-41.81	277.08	282.71	253.24	29.47	9.593			
4,250.00	4,250.00	4,228.68	4,208.72	15.02	15.29	97.76	-38.73	284.14	289.37	259.54	29.83	9.702			
4,300.00	4,300.00	4,278.06	4,257.50	15.20	15.49	96.98	-35.65	291.20	296.08	265.90	30.18	9.810			
4,350.00	4,350.00	4,327.45	4,306.28	15.38	15.68	96.23	-32.57	298.26	302.84	272.31	30.54	9.918			
4,400.00	4,400.00	4,376.84	4,355.07	15.56	15.88	95.52	-29.49	305.33	309.65	278.76	30.89	10.024			
4,450.00	4,450.00	4,426.23	4,403.85	15.74	16.08	94.83	-26.41	312.39	316.51	285.27	31.25	10.130			
4,500.00	4,500.00	4,475.62	4,452.63	15.92	16.28	94.18	-23.33	319.45	323.41	291.81	31.60	10.234			
4,550.00	4,550.00	4,525.04	4,501.45	16.09	16.47	93.51	-20.25	326.51	330.14	298.19	31.95	10.332			
4,600.00	4,600.00	4,574.52	4,550.32	16.26	16.67	92.84	-17.16	333.59	336.47	304.17	32.30	10.416			
4,650.00	4,649.98	4,624.05	4,599.25	16.44	16.87	92.17	-14.07	340.67	342.41	309.76	32.65	10.486			
4,700.00	4,699.96	4,673.64	4,648.23	16.61	17.07	91.50	-10.98	347.76	347.95	314.94	33.00	10.543			
4,750.00	4,749.92	4,723.28	4,697.26	16.78	17.27	90.83	-7.88	354.86	353.08	319.73	33.35	10.586			
4,800.00	4,799.86	4,772.96	4,746.33	16.95	17.47	90.16	-4.78	361.96	357.81	324.10	33.70	10.617			
4,850.00	4,849.78	4,822.68	4,795.45	17.12	17.67	89.49	-1.68	369.07	362.13	328.07	34.05	10.634			
4,900.00	4,899.68	4,872.44	4,844.60	17.30	17.87	88.82	1.42	376.19	366.04	331.63	34.41	10.639			
4,950.00	4,949.54	4,922.24	4,893.79	17.47	18.07	88.15	4.53	383.31	369.54	334.78	34.76	10.632			
5,000.00	4,999.37	4,972.06	4,943.00	17.64	18.27	87.48	7.63	390.43	372.62	337.51	35.11	10.613			
5,050.00	5,049.16	5,021.91	4,992.24	17.82	18.47	86.81	10.74	397.56	375.29	339.83	35.46	10.583			
5,100.00	5,098.90	5,071.79	5,041.50	17.99	18.67	86.14	13.85	404.69	377.55	341.73	35.82	10.542			

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error: 0.00 ft	
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.50 ft	
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Footface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
5,150.00	5,148.61	5,121.68	5,090.78	18.16	18.87	1.20	16.96	411.82	379.41	343.24	36.17	10.490		
5,200.00	5,198.30	5,171.57	5,140.07	18.34	19.08	0.79	20.08	418.96	381.18	344.66	36.52	10.437		
5,250.00	5,247.99	5,221.47	5,189.35	18.52	19.28	0.39	23.19	426.09	382.97	346.09	36.88	10.385		
5,300.00	5,297.69	5,271.36	5,238.64	18.69	19.48	-0.01	26.30	433.23	384.77	347.54	37.23	10.335		
5,350.00	5,347.38	5,321.26	5,287.92	18.87	19.68	-0.41	29.41	440.36	386.60	349.01	37.58	10.286		
5,400.00	5,397.07	5,371.15	5,337.21	19.04	19.88	-0.80	32.52	447.49	388.44	350.50	37.94	10.238		
5,450.00	5,446.77	5,421.05	5,386.49	19.22	20.09	-1.19	35.63	454.63	390.31	352.01	38.29	10.192		
5,500.00	5,496.46	5,470.94	5,435.78	19.40	20.29	-1.57	38.75	461.76	392.19	353.54	38.65	10.147		
5,550.00	5,546.15	5,520.84	5,485.06	19.58	20.49	-1.96	41.86	468.90	394.08	355.08	39.01	10.103		
5,600.00	5,595.84	5,570.73	5,534.34	19.75	20.69	-2.33	44.97	476.03	396.00	356.64	39.36	10.061		
5,650.00	5,645.54	5,620.63	5,583.63	19.93	20.90	-2.71	48.08	483.16	397.93	358.21	39.72	10.019		
5,700.00	5,695.23	5,670.52	5,632.91	20.11	21.10	-3.08	51.19	490.30	399.88	359.81	40.07	9.979		
5,750.00	5,744.92	5,720.42	5,682.20	20.29	21.30	-3.45	54.31	497.43	401.85	361.41	40.43	9.939		
5,800.00	5,794.62	5,770.31	5,731.48	20.47	21.51	-3.81	57.42	504.57	403.83	363.04	40.79	9.901		
5,850.00	5,844.31	5,820.21	5,780.77	20.65	21.71	-4.17	60.53	511.70	405.83	364.68	41.14	9.864		
5,900.00	5,894.00	5,870.11	5,830.05	20.83	21.91	-4.53	63.64	518.83	407.84	366.34	41.50	9.827		
5,950.00	5,943.69	5,920.00	5,879.33	21.01	22.12	-4.88	66.75	525.97	409.87	368.01	41.86	9.792		
6,000.00	5,993.39	5,969.90	5,928.62	21.19	22.32	-5.23	69.87	533.10	411.91	369.70	42.22	9.757		
6,050.00	6,043.08	6,019.79	5,977.90	21.37	22.52	-5.58	72.98	540.24	413.97	371.40	42.57	9.723		
6,100.00	6,092.77	6,069.69	6,027.19	21.55	22.73	-5.92	76.09	547.37	416.05	373.12	42.93	9.691		
6,150.00	6,142.47	6,119.58	6,076.47	21.73	22.93	-6.26	79.20	554.50	418.14	374.85	43.29	9.659		
6,200.00	6,192.16	6,169.48	6,125.76	21.91	23.14	-6.59	82.31	561.64	420.24	376.59	43.65	9.628		
6,250.00	6,241.85	6,219.37	6,175.04	22.09	23.34	-6.93	85.42	568.77	422.36	378.35	44.01	9.597		
6,300.00	6,291.54	6,269.27	6,224.32	22.27	23.54	-7.26	88.54	575.91	424.50	380.13	44.37	9.568		
6,350.00	6,341.24	6,319.16	6,273.61	22.46	23.75	-7.58	91.65	583.04	426.64	381.92	44.73	9.539		
6,400.00	6,390.93	6,369.06	6,322.89	22.64	23.95	-7.90	94.76	590.17	428.80	383.72	45.09	9.510		
6,450.00	6,440.62	6,418.95	6,372.18	22.82	24.16	-8.22	97.87	597.31	430.98	385.53	45.45	9.483		
6,500.00	6,490.32	6,468.85	6,421.46	23.00	24.36	-8.54	100.98	604.44	433.17	387.36	45.81	9.456		
6,550.00	6,540.01	6,518.74	6,470.75	23.19	24.57	-8.85	104.10	611.58	435.37	389.20	46.17	9.430		
6,600.00	6,589.70	6,568.64	6,520.03	23.37	24.77	-9.16	107.21	618.71	437.58	391.05	46.53	9.404		
6,650.00	6,639.39	6,618.53	6,569.32	23.55	24.97	-9.47	110.32	625.84	439.81	392.92	46.89	9.380		
6,700.00	6,689.09	6,668.43	6,618.60	23.73	25.16	-9.77	113.43	632.98	442.04	394.79	47.25	9.355		
6,750.00	6,738.78	6,718.32	6,667.88	23.92	25.38	-10.07	116.54	640.11	444.29	396.68	47.61	9.332		
6,800.00	6,788.47	6,768.22	6,717.17	24.10	25.59	-10.37	119.65	647.25	446.56	398.58	47.97	9.308		
6,850.00	6,838.17	6,818.11	6,766.45	24.29	25.79	-10.67	122.77	654.38	448.83	400.50	48.34	9.286		
6,900.00	6,887.86	6,868.01	6,815.74	24.47	26.00	-10.96	125.88	661.51	451.12	402.42	48.70	9.264		
6,950.00	6,937.55	6,917.90	6,865.02	24.65	26.20	-11.25	128.99	668.65	453.42	404.36	49.06	9.242		
7,000.00	6,987.24	6,967.80	6,914.31	24.84	26.41	-11.53	132.10	675.78	455.73	406.30	49.42	9.221		
7,050.00	7,036.94	7,017.69	6,963.59	25.02	26.61	-11.82	135.21	682.92	458.05	408.26	49.78	9.201		
7,100.00	7,086.63	7,067.59	7,012.87	25.21	26.82	-12.10	138.33	690.05	460.38	410.23	50.15	9.180		
7,150.00	7,136.32	7,117.48	7,062.16	25.39	27.02	-12.37	141.44	697.18	462.72	412.21	50.51	9.161		
7,200.00	7,186.02	7,167.38	7,111.44	25.58	27.23	-12.65	144.55	704.32	465.07	414.20	50.87	9.142		
7,250.00	7,235.71	7,217.27	7,160.73	25.76	27.43	-12.92	147.66	711.45	467.44	416.20	51.24	9.123		
7,300.00	7,285.40	7,267.17	7,210.01	25.95	27.64	-13.19	150.77	718.59	469.81	418.21	51.60	9.105		
7,350.00	7,335.09	7,317.06	7,259.30	26.13	27.84	-13.45	153.89	725.72	472.20	420.23	51.97	9.087		
7,400.00	7,384.79	7,366.96	7,308.58	26.32	28.05	-13.72	157.00	732.85	474.59	422.26	52.33	9.069		
7,450.00	7,434.48	7,416.85	7,357.87	26.50	28.26	-13.98	160.11	739.99	477.00	424.30	52.69	9.052		
7,500.00	7,484.17	7,466.75	7,407.15	26.69	28.46	-14.24	163.22	747.12	479.41	426.35	53.06	9.036		
7,550.00	7,533.86	7,516.65	7,456.43	26.87	28.67	-14.49	166.33	754.26	481.84	428.41	53.42	9.019		
7,600.00	7,583.56	7,573.35	7,512.50	27.06	28.90	-14.78	169.72	762.02	483.94	430.08	53.86	8.985		
7,650.00	7,633.25	7,630.51	7,569.15	27.25	29.13	-15.05	172.80	769.07	485.31	431.02	54.29	8.939		
7,700.00	7,682.94	7,687.72	7,625.94	27.43	29.35	-15.32	175.53	775.35	485.94	431.23	54.71	8.882		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Sec 27-T25S-R31E - Lusitano 27-34 Fed Com 534H - Wellbore #1 - Permit Plan 1													Offset Well Error:	0.50 ft
Survey Program: 0-MWD+HDGM														
Reference		Offset		Semi-Major Axis		Distance		Minimum Separation		Separation Factor		Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside (ft)	Offset Wellbore Centre (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
7,750.00	7,732.64	7,744.94	7,682.84	27.62	29.57	-15.57	177.93	780.85	485.83	430.71	55.12	8.814		
7,800.00	7,782.33	7,802.15	7,739.82	27.81	29.79	-15.82	179.99	785.57	484.98	429.46	55.52	8.735		
7,850.00	7,832.02	7,859.32	7,796.83	27.99	29.99	-16.06	181.71	789.50	483.40	427.49	55.91	8.646		
7,900.00	7,881.71	7,916.43	7,853.83	28.18	30.20	-16.30	183.08	792.65	481.08	424.79	56.29	8.547		
7,950.00	7,931.41	7,973.45	7,910.80	28.37	30.40	-16.53	184.11	795.01	478.01	421.36	56.65	8.438		
8,000.00	7,981.10	8,030.36	7,967.68	28.55	30.60	-16.77	184.80	796.60	474.22	417.21	57.00	8.319		
8,050.00	8,030.79	8,087.13	8,024.44	28.74	30.79	-16.99	185.15	797.40	469.69	412.34	57.35	8.190		
8,100.00	8,080.49	8,140.57	8,077.89	28.93	30.96	-17.21	185.20	797.51	464.50	406.81	57.69	8.052		
8,150.00	8,130.18	8,209.73	8,127.58	29.11	31.19	-17.41	185.20	797.51	459.22	401.11	58.10	7.903		
8,200.00	8,179.87	8,239.96	8,177.27	29.30	31.29	-17.62	185.20	797.51	453.94	395.55	58.39	7.774		
8,250.00	8,229.56	8,289.65	8,226.96	29.49	31.45	-17.84	185.20	797.51	448.66	389.92	58.74	7.638		
8,300.00	8,279.26	8,339.35	8,276.66	29.68	31.62	-18.06	185.20	797.51	443.39	384.30	59.09	7.504		
8,350.00	8,328.95	8,389.04	8,326.35	29.86	31.78	-18.28	185.20	797.51	438.13	378.69	59.44	7.371		
8,400.00	8,378.64	8,438.73	8,376.04	30.05	31.94	-18.51	185.20	797.51	432.88	373.08	59.80	7.239		
8,450.00	8,428.34	8,488.44	8,433.74	30.24	32.13	-18.69	184.48	797.51	427.44	367.34	60.10	7.112		
8,500.00	8,478.03	8,538.15	8,501.31	30.43	32.32	-18.07	177.05	797.52	420.17	359.90	60.27	6.972		
8,550.00	8,527.72	8,587.83	8,564.89	30.62	32.50	-16.45	162.45	797.54	410.92	350.54	60.38	6.805		
8,600.00	8,577.41	8,637.52	8,622.59	30.80	32.64	-13.92	142.29	797.58	400.18	339.65	60.53	6.611		
8,650.00	8,627.11	8,687.22	8,673.42	30.99	32.76	-10.68	118.46	797.61	388.64	327.85	60.79	6.393		
8,700.00	8,676.80	8,726.91	8,713.19	31.18	32.86	-6.92	92.70	797.65	377.18	315.97	61.20	6.163		
8,750.00	8,726.49	8,776.60	8,763.32	31.37	32.93	-2.88	66.43	797.69	366.72	304.97	61.75	5.939		
8,800.00	8,776.19	8,826.30	8,813.02	31.56	32.98	1.24	40.63	797.73	358.23	295.88	62.35	5.745		
8,850.00	8,825.88	8,875.99	8,862.71	31.74	33.03	5.27	15.84	797.77	352.64	289.77	62.87	5.609		
8,897.99	8,873.57	8,904.22	8,890.63	31.93	33.06	8.95	-6.38	797.80	350.74	287.59	63.15	5.554		
8,900.00	8,875.57	8,916.63	8,903.03	31.93	33.06	9.10	-7.28	797.80	350.74	287.59	63.15	5.554 SF		
8,950.00	8,925.26	8,975.90	8,962.68	32.12	33.08	12.66	-28.88	797.84	353.15	290.10	63.05	5.601		
9,000.00	8,974.96	9,025.05	8,986.99	32.31	33.10	15.91	-48.82	797.87	360.23	297.72	62.51	5.763		
9,050.00	9,024.65	9,074.74	9,061.70	32.50	33.12	18.85	-67.15	797.89	372.05	310.54	61.51	6.048		
9,100.00	9,074.34	9,124.83	9,111.79	32.69	33.13	21.81	-86.06	797.92	388.48	328.25	60.23	6.450		
9,150.00	9,124.04	9,174.92	9,161.88	32.88	33.14	23.85	-99.41	797.94	409.16	350.61	58.54	6.989		
9,200.00	9,173.73	9,223.82	9,210.78	33.07	33.15	25.96	-113.55	797.96	433.66	376.86	56.80	7.635		
9,250.00	9,223.42	9,273.51	9,260.47	33.25	33.16	28.30	-129.67	797.99	461.52	406.35	55.17	8.366		
9,300.00	9,273.11	9,323.20	9,310.16	33.44	33.16	29.55	-138.48	798.00	492.22	438.89	53.32	9.231		
9,350.00	9,322.81	9,372.90	9,359.86	33.63	33.16	31.06	-149.47	798.02	525.38	473.67	51.71	10.160		
9,400.00	9,372.50	9,422.59	9,409.55	33.82	33.17	32.43	-159.60	798.03	560.63	510.40	50.23	11.162		
9,450.00	9,422.19	9,472.28	9,459.24	34.01	33.17	34.47	-175.23	798.06	597.71	548.59	49.13	12.167		
9,500.00	9,471.89	9,521.98	9,508.94	34.20	33.17	34.47	-175.23	798.06	636.15	588.55	47.60	13.365		
9,550.00	9,521.58	9,571.67	9,558.63	34.39	33.17	35.79	-185.69	798.07	675.91	629.29	46.62	14.499		
9,600.00	9,571.27	9,621.36	9,608.32	34.58	33.18	36.72	-193.17	798.09	716.76	671.09	45.67	15.694		
9,650.00	9,620.96	9,671.05	9,657.91	34.77	33.18	37.56	-200.14	798.10	758.54	713.70	44.84	16.916		
9,700.00	9,670.66	9,720.75	9,707.61	34.96	33.18	38.33	-206.65	798.11	801.12	757.00	44.11	18.161		
9,750.00	9,720.35	9,770.44	9,757.30	35.15	33.19	40.14	-222.41	798.13	844.54	800.79	43.75	19.304		
9,800.00	9,770.04	9,820.13	9,806.99	35.34	33.19	40.14	-222.41	798.13	888.29	845.26	43.03	20.645		
9,850.00	9,819.74	9,869.83	9,806.69	35.53	33.19	40.39	-222.41	798.13	932.68	890.27	42.41	21.994		
9,900.00	9,869.44	9,919.53	9,856.39	35.72	33.19	41.41	-222.41	798.13	977.76	935.88	41.88	23.347		
9,950.00	9,919.29	9,969.62	9,856.32	35.90	33.19	42.55	-222.41	798.13	1,023.50	982.05	41.44	24.698		
10,000.00	9,969.15	10,019.24	9,956.11	36.09	33.19	45.54	-238.09	798.15	1,069.44	1,028.04	41.40	25.829		
10,050.00	10,019.05	10,069.14	9,956.24	36.27	33.19	47.39	-242.36	798.16	1,116.02	1,074.84	41.17	27.105		
10,100.00	10,068.99	10,118.98	9,960.29	36.45	33.19	49.35	-246.42	798.17	1,162.98	1,121.99	40.99	28.375		
10,150.00	10,118.96	10,168.95	9,961.26	36.63	33.19	51.44	-250.27	798.17	1,210.28	1,169.44	40.84	29.636		
10,200.00	10,168.95	10,218.94	9,962.15	36.80	33.20	53.65	-253.94	798.18	1,257.87	1,217.15	40.72	30.888		
10,250.00	10,218.94	10,268.93	9,965.95	36.98	33.20	57.25	-270.86	798.20	1,305.96	1,265.11	40.86	31.964		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:
Sec 27-T25S-R31E - Lusitano 27-34 Fed Com 534H - Wellbore #1 - Permit Plan 1													0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.50 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,300.00	10,268.94	9,250.00	8,965.95	37.15	33.20	144.25	-270.86	798.20	1,353.91	1,313.17	40.74	33.236	
10,350.00	10,318.94	9,250.00	8,965.95	37.32	33.20	144.25	-270.86	798.20	1,402.00	1,361.36	40.64	34.498	
10,400.00	10,368.94	9,250.00	8,965.95	37.49	33.20	144.25	-270.86	798.20	1,450.23	1,409.66	40.57	35.749	
10,450.00	10,418.94	9,250.00	8,965.95	37.67	33.20	144.25	-270.86	798.20	1,498.56	1,458.05	40.51	36.989	

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:
Sec 27-T25S-R31E - Lusitano 27-34 Fed Com 622H - Wellbore #1 - Permit Plan 2													0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:
Reference													0.50 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.30	-0.30	0.50	0.50	-90.36	-0.19	-30.02	30.02				
50.00	50.00	49.70	49.70	0.50	0.50	-90.36	-0.19	-30.02	30.02	29.01	1.01	29.828	
100.00	100.00	100.30	99.70	0.52	0.52	-90.36	-0.19	-30.02	30.02	28.98	1.04	28.983	
150.00	150.00	149.70	149.70	0.59	0.59	-90.36	-0.19	-30.02	30.02	28.84	1.18	25.443	
200.00	200.00	200.30	199.70	0.70	0.70	-90.36	-0.19	-30.02	30.02	28.62	1.40	21.368	
250.00	250.00	249.70	249.70	0.84	0.84	-90.36	-0.19	-30.02	30.02	28.35	1.67	17.927	
300.00	300.00	300.30	299.70	0.99	0.99	-90.36	-0.19	-30.02	30.02	28.05	1.98	15.196	
350.00	350.00	349.70	349.70	1.15	1.14	-90.36	-0.19	-30.02	30.02	27.73	2.29	13.109	
400.00	400.00	400.30	399.70	1.31	1.31	-90.36	-0.19	-30.02	30.02	27.40	2.62	11.462	
450.00	450.00	449.70	449.70	1.48	1.48	-90.36	-0.19	-30.02	30.02	27.07	2.95	10.171	
500.00	500.00	500.30	499.70	1.65	1.65	-90.36	-0.19	-30.02	30.02	26.73	3.29	9.116	
550.00	550.00	549.70	549.70	1.82	1.82	-90.36	-0.19	-30.02	30.02	26.39	3.63	8.260	
600.00	600.00	600.30	599.70	1.99	1.99	-90.36	-0.19	-30.02	30.02	26.04	3.98	7.539	
650.00	650.00	649.70	649.70	2.16	2.16	-90.36	-0.19	-30.02	30.02	25.69	4.33	6.936	
700.00	700.00	700.30	699.70	2.34	2.34	-90.36	-0.19	-30.02	30.02	25.34	4.68	6.415	
750.00	750.00	749.70	749.70	2.51	2.51	-90.36	-0.19	-30.02	30.02	24.99	5.03	5.970	
800.00	800.00	800.30	799.70	2.69	2.69	-90.36	-0.19	-30.02	30.02	24.64	5.38	5.578	
850.00	850.00	849.70	849.70	2.87	2.87	-90.36	-0.19	-30.02	30.02	24.29	5.73	5.237	
900.00	900.00	900.30	899.70	3.04	3.04	-90.36	-0.19	-30.02	30.02	23.93	6.09	4.931 Alert	
950.00	950.00	949.70	949.70	3.22	3.22	-90.36	-0.19	-30.02	30.02	23.58	6.44	4.662 Alert	
1,000.00	1,000.00	1,000.30	999.70	3.40	3.40	-90.36	-0.19	-30.02	30.02	23.22	6.80	4.417 Alert	
1,050.00	1,050.00	1,049.70	1,049.70	3.58	3.57	-90.36	-0.19	-30.02	30.02	22.87	7.15	4.199 Alert	
1,100.00	1,100.00	1,100.30	1,099.70	3.75	3.75	-90.36	-0.19	-30.02	30.02	22.51	7.51	3.999 Alert	
1,150.00	1,150.00	1,149.70	1,149.70	3.93	3.93	-90.36	-0.19	-30.02	30.02	22.16	7.86	3.820 Alert	
1,200.00	1,200.00	1,200.30	1,199.70	4.11	4.11	-90.36	-0.19	-30.02	30.02	21.80	8.22	3.653 Alert	
1,250.00	1,250.00	1,249.70	1,249.70	4.29	4.29	-90.36	-0.19	-30.02	30.02	21.45	8.57	3.503 Alert	
1,300.00	1,300.00	1,300.30	1,299.70	4.46	4.47	-90.36	-0.19	-30.02	30.02	21.09	8.93	3.362 Alert	
1,350.00	1,350.00	1,349.70	1,349.70	4.64	4.64	-90.36	-0.19	-30.02	30.02	20.74	9.28	3.234 Alert	
1,400.00	1,400.00	1,400.30	1,399.70	4.82	4.82	-90.36	-0.19	-30.02	30.02	20.38	9.64	3.113 Alert	
1,450.00	1,450.00	1,449.70	1,449.70	5.00	5.00	-90.36	-0.19	-30.02	30.02	20.02	10.00	3.003 Alert	
1,500.00	1,500.00	1,500.30	1,499.70	5.18	5.18	-90.36	-0.19	-30.02	30.02	19.67	10.36	2.899 Alert	
1,550.00	1,550.00	1,549.70	1,549.70	5.36	5.35	-90.36	-0.19	-30.02	30.02	19.31	10.71	2.803 Alert	
1,600.00	1,600.00	1,600.30	1,599.70	5.53	5.54	-90.36	-0.19	-30.02	30.02	18.95	11.07	2.712 Alert	
1,650.00	1,650.00	1,649.70	1,649.70	5.71	5.71	-90.36	-0.19	-30.02	30.02	18.60	11.42	2.628 Alert	
1,700.00	1,700.00	1,700.30	1,699.70	5.89	5.89	-90.36	-0.19	-30.02	30.02	18.24	11.78	2.548 Alert	
1,750.00	1,750.00	1,749.70	1,749.70	6.07	6.07	-90.36	-0.19	-30.02	30.02	17.88	12.14	2.473 Minor Risk	
1,800.00	1,800.00	1,800.30	1,799.70	6.25	6.25	-90.36	-0.19	-30.02	30.02	17.52	12.50	2.402 Minor Risk	
1,850.00	1,850.00	1,849.70	1,849.70	6.43	6.43	-90.36	-0.19	-30.02	30.02	17.17	12.85	2.336 Minor Risk	
1,900.00	1,900.00	1,900.30	1,899.70	6.61	6.61	-90.36	-0.19	-30.02	30.02	16.81	13.21	2.272 Minor Risk	
1,950.00	1,950.00	1,949.70	1,949.70	6.78	6.78	-90.36	-0.19	-30.02	30.02	16.45	13.57	2.213 Minor Risk	
2,000.00	2,000.00	1,999.70	1,999.70	6.96	6.96	-90.36	-0.19	-30.02	30.02	16.10	13.93	2.156 Minor Risk, CC	
2,050.00	2,050.00	2,049.70	2,049.70	7.14	7.13	-90.77	-0.41	-30.02	30.02	15.75	14.27	2.103 Minor Risk	
2,100.00	2,100.00	2,100.31	2,099.68	7.32	7.30	-91.98	-1.04	-30.02	30.04	15.42	14.62	2.054 Minor Risk	
2,150.00	2,150.00	2,149.68	2,149.67	7.50	7.46	-93.40	-1.78	-30.02	30.07	15.11	14.96	2.010 Minor Risk	
2,200.00	2,200.00	2,200.32	2,199.66	7.68	7.63	-94.80	-2.52	-30.02	30.13	14.82	15.30	1.969 Minor Risk	
2,250.00	2,250.00	2,249.67	2,249.65	7.86	7.79	-96.21	-3.27	-30.02	30.20	14.55	15.64	1.930 Minor Risk	
2,300.00	2,300.00	2,300.33	2,299.64	8.04	7.95	-97.60	-4.01	-30.02	30.29	14.30	15.99	1.894 Minor Risk	
2,350.00	2,350.00	2,349.66	2,349.63	8.22	8.12	-98.99	-4.75	-30.02	30.39	14.06	16.33	1.861 Minor Risk	
2,400.00	2,400.00	2,400.34	2,399.62	8.39	8.28	-100.37	-5.49	-30.02	30.52	13.84	16.68	1.830 Minor Risk	
2,450.00	2,450.00	2,449.65	2,449.61	8.57	8.45	-101.73	-6.24	-30.02	30.66	13.64	17.02	1.802 Minor Risk	
2,500.00	2,500.00	2,500.35	2,499.60	8.75	8.61	-103.08	-6.98	-30.02	30.82	13.46	17.37	1.775 Minor Risk	
2,550.00	2,550.00	2,549.64	2,549.59	8.93	8.78	-104.42	-7.72	-30.02	31.00	13.29	17.71	1.750 Minor Risk	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDM														Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Footface (ft)	Offset Wellbore Centre N/S (ft)	Offset Wellbore Centre E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
2,600.00	2,600.00	2,600.37	2,599.57	9.11	8.95	-105.74	-8.46	-30.02	31.19	13.13	18.06	1.727	Minor Risk		
2,650.00	2,650.00	2,649.63	2,649.56	9.29	9.11	-107.05	-9.20	-30.02	31.40	13.00	18.40	1.706	Minor Risk		
2,700.00	2,700.00	2,700.38	2,699.55	9.47	9.28	-108.33	-9.95	-30.02	31.63	12.87	18.75	1.687	Minor Risk		
2,750.00	2,750.00	2,749.62	2,749.54	9.65	9.45	-109.60	-10.69	-30.02	31.87	12.77	19.10	1.669	Minor Risk		
2,800.00	2,800.00	2,800.39	2,799.53	9.83	9.62	-110.85	-11.43	-30.02	32.12	12.68	19.45	1.652	Minor Risk		
2,850.00	2,850.00	2,849.61	2,849.52	10.00	9.79	-112.07	-12.17	-30.02	32.40	12.60	19.79	1.637	Minor Risk		
2,900.00	2,900.00	2,900.40	2,899.51	10.18	9.96	-113.28	-12.92	-30.02	32.68	12.54	20.14	1.622	Minor Risk		
2,950.00	2,950.00	2,949.60	2,949.50	10.36	10.13	-114.46	-13.66	-30.02	32.98	12.49	20.49	1.610	Minor Risk		
3,000.00	3,000.00	3,000.41	2,999.49	10.54	10.30	-115.63	-14.40	-30.02	33.30	12.45	20.84	1.597	Minor Risk		
3,050.00	3,050.00	3,049.58	3,049.48	10.72	10.47	-116.77	-15.14	-30.02	33.62	12.43	21.19	1.587	Minor Risk		
3,100.00	3,100.00	3,100.42	3,099.46	10.90	10.64	-117.89	-15.89	-30.02	33.96	12.42	21.54	1.577	Minor Risk, ES		
3,150.00	3,150.00	3,149.57	3,149.45	11.08	10.81	-118.98	-16.63	-30.02	34.32	12.43	21.89	1.568	Minor Risk		
3,200.00	3,200.00	3,200.43	3,199.44	11.26	10.99	-120.05	-17.37	-30.02	34.68	12.44	22.24	1.559	Minor Risk		
3,250.00	3,250.00	3,249.56	3,249.43	11.44	11.16	-121.10	-18.11	-30.02	35.06	12.47	22.59	1.552	Minor Risk		
3,300.00	3,300.00	3,300.44	3,299.42	11.62	11.33	-122.13	-18.85	-30.02	35.45	12.51	22.95	1.545	Minor Risk		
3,350.00	3,350.00	3,349.55	3,349.41	11.80	11.50	-123.14	-19.60	-30.02	35.85	12.56	23.29	1.539	Minor Risk		
3,400.00	3,400.00	3,400.45	3,399.40	11.97	11.68	-124.12	-20.34	-30.02	36.26	12.61	23.65	1.533	Minor Risk		
3,450.00	3,450.00	3,449.54	3,449.39	12.15	11.84	-125.08	-21.08	-30.02	36.68	12.69	24.00	1.529	Minor Risk		
3,500.00	3,500.00	3,500.47	3,499.38	12.33	12.02	-126.02	-21.82	-30.02	37.12	12.76	24.35	1.524	Minor Risk		
3,550.00	3,550.00	3,549.53	3,549.36	12.51	12.19	-126.93	-22.57	-30.02	37.56	12.86	24.70	1.520	Minor Risk		
3,600.00	3,600.00	3,600.48	3,599.35	12.69	12.37	-127.83	-23.31	-30.02	38.01	12.95	25.06	1.517	Minor Risk		
3,650.00	3,650.00	3,649.52	3,649.34	12.87	12.54	-128.70	-24.05	-30.02	38.47	13.06	25.41	1.514	Minor Risk		
3,700.00	3,700.00	3,700.49	3,699.33	13.05	12.71	-129.55	-24.79	-30.02	38.94	13.17	25.76	1.511	Minor Risk		
3,750.00	3,750.00	3,749.51	3,749.32	13.23	12.89	-130.39	-25.54	-30.02	39.41	13.30	26.11	1.509	Minor Risk		
3,800.00	3,800.00	3,800.50	3,799.31	13.41	13.06	-131.20	-26.28	-30.02	39.90	13.43	26.47	1.507	Minor Risk		
3,850.00	3,850.00	3,849.50	3,849.30	13.59	13.23	-131.99	-27.02	-30.02	40.39	13.57	26.82	1.506	Minor Risk		
3,900.00	3,900.00	3,900.51	3,899.29	13.77	13.41	-132.76	-27.76	-30.02	40.89	13.72	27.17	1.505	Minor Risk		
3,950.00	3,950.00	3,949.49	3,949.28	13.94	13.58	-133.52	-28.51	-30.02	41.40	13.88	27.52	1.504	Minor Risk		
4,000.00	4,000.00	4,000.52	3,999.27	14.12	13.76	-134.25	-29.25	-30.02	41.91	14.03	27.88	1.503	Minor Risk		
4,050.00	4,050.00	4,049.47	4,049.25	14.30	13.93	-134.97	-29.99	-30.02	42.44	14.20	28.23	1.503	Minor Risk		
4,100.00	4,100.00	4,100.53	4,099.24	14.48	14.11	-135.67	-30.73	-30.02	42.96	14.38	28.59	1.503	Minor Risk, SF		
4,150.00	4,150.00	4,149.46	4,149.23	14.66	14.28	-136.36	-31.47	-30.02	43.50	14.56	28.94	1.503	Minor Risk		
4,200.00	4,200.00	4,200.54	4,199.22	14.84	14.46	-137.02	-32.22	-30.02	44.04	14.74	29.30	1.503	Minor Risk		
4,250.00	4,250.00	4,249.45	4,249.21	15.02	14.63	-137.67	-32.96	-30.02	44.58	14.94	29.65	1.504	Minor Risk		
4,300.00	4,300.00	4,300.55	4,299.20	15.20	14.81	-138.31	-33.70	-30.02	45.14	15.13	30.01	1.504	Minor Risk		
4,350.00	4,350.00	4,349.44	4,349.19	15.38	14.98	-138.93	-34.44	-30.02	45.69	15.34	30.36	1.505	Minor Risk		
4,400.00	4,400.00	4,400.56	4,399.18	15.56	15.16	-139.53	-35.19	-30.02	46.26	15.54	30.71	1.506	Minor Risk		
4,450.00	4,450.00	4,449.43	4,449.17	15.74	15.33	-140.12	-35.93	-30.02	46.82	15.76	31.06	1.507	Minor Risk		
4,500.00	4,500.00	4,500.58	4,499.16	15.92	15.51	-140.70	-36.67	-30.02	47.39	15.97	31.42	1.508	Minor Risk		
4,550.00	4,550.00	4,549.42	4,549.14	16.09	15.69	-141.28	-37.41	-30.02	48.12	16.35	31.77	1.515	Minor Risk		
4,600.00	4,600.00	4,600.59	4,599.13	16.26	15.87	-141.85	-38.16	-30.02	49.14	17.01	32.12	1.530	Minor Risk		
4,650.00	4,649.98	4,649.39	4,649.10	16.44	16.04	-142.42	-38.90	-30.02	50.45	17.98	32.47	1.554	Minor Risk		
4,700.00	4,699.96	4,700.64	4,699.07	16.61	16.22	-143.00	-39.64	-30.02	52.07	19.25	32.82	1.587	Minor Risk		
4,750.00	4,749.92	4,749.31	4,749.02	16.78	16.39	-143.58	-40.38	-30.02	53.99	20.83	33.16	1.628	Minor Risk		
4,800.00	4,799.86	4,800.75	4,798.95	16.95	16.57	-144.16	-41.12	-30.02	56.25	22.74	33.51	1.678	Minor Risk		
4,850.00	4,849.78	4,849.16	4,848.85	17.12	16.74	-144.74	-41.86	-30.02	58.85	24.99	33.86	1.738	Minor Risk		
4,900.00	4,899.68	4,900.96	4,898.73	17.30	16.92	-145.32	-42.60	-30.02	61.81	27.59	34.21	1.807	Minor Risk		
4,950.00	4,949.54	4,948.90	4,948.58	17.47	17.09	-145.90	-43.35	-30.02	65.14	30.59	34.55	1.885	Minor Risk		
5,000.00	4,999.37	5,001.28	4,998.39	17.64	17.28	-146.48	-44.08	-30.02	68.87	33.96	34.91	1.973	Minor Risk		
5,050.00	5,049.16	5,048.50	5,048.17	17.82	17.44	-147.06	-44.82	-30.02	73.01	37.76	35.25	2.071	Minor Risk		
5,100.00	5,098.90	5,098.23	5,097.90	17.99	17.62	-147.64	-45.56	-30.02	77.57	41.97	35.60	2.179	Minor Risk		
5,150.00	5,148.61	5,147.93	5,147.59	18.16	17.80	-148.22	-46.30	-30.02	82.54	46.60	35.94	2.296	Minor Risk		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset-Design Sec 27-T25S-R31E - Lusitano 27 34 Fed Com 622H - Wellbore #1 - Permit Plan 2														Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDCM														Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Footface (ft)	Offset Wellbore Centre - N-S (ft)	Offset Wellbore Centre - E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
5,200.00	5,198.30	5,202.39	5,197.27	18.34	17.99	148.83	-47.04	-30.02	87.67	51.36	36.31	2.415	Minor Risk		
5,250.00	5,247.99	5,247.29	5,246.94	18.52	18.15	150.22	-47.78	-30.02	92.86	56.22	36.64	2.534	Alert		
5,300.00	5,297.69	5,303.02	5,296.62	18.69	18.34	151.46	-48.51	-30.02	98.10	61.09	37.01	2.651	Alert		
5,350.00	5,347.38	5,346.66	5,346.30	18.87	18.50	152.57	-49.25	-30.02	103.37	66.04	37.34	2.769	Alert		
5,400.00	5,397.07	5,403.66	5,395.97	19.04	18.70	153.58	-49.99	-30.02	108.69	70.98	37.71	2.882	Alert		
5,450.00	5,446.77	5,446.02	5,445.65	19.22	18.85	154.49	-50.73	-30.02	114.03	76.00	38.03	2.998	Alert		
5,500.00	5,496.46	5,504.29	5,495.33	19.40	19.06	155.32	-51.46	-30.02	119.40	80.98	38.41	3.108	Alert		
5,550.00	5,546.15	5,545.39	5,545.00	19.58	19.20	156.08	-52.20	-30.02	124.79	86.06	38.73	3.222	Alert		
5,600.00	5,595.84	5,604.93	5,594.68	19.75	19.41	156.78	-52.94	-30.02	130.20	91.09	39.12	3.329	Alert		
5,650.00	5,645.54	5,644.75	5,644.36	19.93	19.56	157.42	-53.68	-30.02	135.63	96.20	39.43	3.440	Alert		
5,700.00	5,695.23	5,705.56	5,694.03	20.11	19.77	158.01	-54.42	-30.02	141.07	101.25	39.82	3.543	Alert		
5,750.00	5,744.92	5,744.12	5,743.71	20.29	19.91	158.56	-55.15	-30.02	146.53	106.40	40.13	3.651	Alert		
5,800.00	5,794.62	5,806.20	5,793.39	20.47	20.13	159.07	-55.89	-30.02	152.00	111.48	40.52	3.751	Alert		
5,850.00	5,844.31	5,843.48	5,843.07	20.65	20.26	159.54	-56.63	-30.02	157.48	116.65	40.83	3.857	Alert		
5,900.00	5,894.00	5,906.84	5,892.74	20.83	20.48	159.98	-57.37	-30.02	162.98	121.75	41.23	3.953	Alert		
5,950.00	5,943.69	5,942.85	5,942.42	21.01	20.61	160.40	-58.10	-30.02	168.48	126.95	41.53	4.057	Alert		
6,000.00	5,993.39	6,007.47	5,992.10	21.19	20.84	160.78	-58.84	-30.02	173.98	132.05	41.93	4.149	Alert		
6,050.00	6,043.08	6,042.21	6,041.77	21.37	20.97	161.14	-59.58	-30.02	179.50	137.27	42.23	4.250	Alert		
6,100.00	6,092.77	6,108.11	6,091.45	21.55	21.20	161.49	-60.32	-30.02	185.02	142.38	42.64	4.339	Alert		
6,150.00	6,142.47	6,141.58	6,141.13	21.73	21.32	161.81	-61.05	-30.02	190.55	147.62	42.94	4.438	Alert		
6,200.00	6,192.16	6,208.74	6,190.80	21.91	21.56	162.11	-61.79	-30.02	196.09	152.74	43.35	4.523	Alert		
6,250.00	6,241.85	6,240.94	6,240.48	22.09	21.67	162.40	-62.53	-30.02	201.62	157.99	43.64	4.620	Alert		
6,300.00	6,291.54	6,309.38	6,290.16	22.27	21.92	162.67	-63.27	-30.02	207.17	163.11	44.06	4.702	Alert		
6,350.00	6,341.24	6,340.31	6,339.83	22.46	22.03	162.92	-64.01	-30.02	212.72	168.37	44.34	4.797	Alert		
6,400.00	6,390.93	6,389.99	6,389.51	22.64	22.20	163.17	-64.74	-30.02	218.27	173.58	44.69	4.884	Alert		
6,450.00	6,440.62	6,439.67	6,439.19	22.82	22.38	163.40	-65.48	-30.02	223.83	178.78	45.05	4.969	Alert		
6,500.00	6,490.32	6,489.35	6,488.86	23.00	22.56	163.62	-66.22	-30.02	229.39	183.99	45.40	5.053			
6,550.00	6,540.01	6,539.04	6,538.54	23.19	22.73	163.83	-66.96	-30.02	234.95	189.20	45.75	5.135			
6,600.00	6,589.70	6,588.72	6,588.22	23.37	22.91	164.03	-67.69	-30.02	240.51	194.41	46.10	5.217			
6,650.00	6,639.39	6,638.40	6,637.90	23.55	23.09	164.22	-68.43	-30.02	246.08	199.62	46.46	5.297			
6,700.00	6,689.09	6,688.08	6,687.57	23.73	23.26	164.41	-69.17	-30.02	251.65	204.84	46.81	5.376			
6,750.00	6,738.78	6,737.77	6,737.25	23.92	23.44	164.58	-69.91	-30.02	257.23	210.06	47.16	5.454			
6,800.00	6,788.47	6,787.45	6,786.93	24.10	23.62	164.75	-70.65	-30.02	262.80	215.29	47.52	5.531			
6,850.00	6,838.17	6,837.13	6,836.60	24.29	23.79	164.91	-71.38	-30.02	268.38	220.51	47.87	5.606			
6,900.00	6,887.86	6,886.81	6,886.28	24.47	23.97	165.06	-72.12	-30.02	273.96	225.74	48.22	5.681			
6,950.00	6,937.55	6,936.50	6,935.96	24.65	24.15	165.21	-72.86	-30.02	279.54	230.96	48.58	5.755			
7,000.00	6,987.24	6,986.18	6,985.63	24.84	24.32	165.35	-73.60	-30.02	285.13	236.19	48.93	5.827			
7,050.00	7,036.94	7,035.86	7,035.31	25.02	24.50	165.49	-74.33	-30.02	290.71	241.43	49.29	5.899			
7,100.00	7,086.63	7,085.54	7,084.99	25.21	24.68	165.62	-75.07	-30.02	296.30	246.66	49.64	5.969			
7,150.00	7,136.32	7,135.22	7,134.66	25.39	24.86	165.75	-75.81	-30.02	301.89	251.89	49.99	6.039			
7,200.00	7,186.02	7,184.91	7,184.34	25.58	25.03	165.87	-76.55	-30.02	307.48	257.13	50.35	6.107			
7,250.00	7,235.71	7,234.59	7,234.02	25.76	25.21	165.99	-77.28	-30.02	313.07	262.36	50.70	6.175			
7,300.00	7,285.40	7,284.27	7,283.70	25.95	25.39	166.10	-78.02	-30.02	318.66	267.60	51.06	6.241			
7,350.00	7,335.09	7,333.95	7,333.37	26.13	25.56	166.21	-78.76	-30.02	324.25	272.84	51.41	6.307			
7,400.00	7,384.79	7,383.64	7,383.05	26.32	25.74	166.32	-79.50	-30.02	329.85	278.08	51.77	6.372			
7,450.00	7,434.48	7,433.32	7,432.73	26.50	25.92	166.42	-80.24	-30.02	335.44	283.32	52.12	6.436			
7,500.00	7,484.17	7,483.00	7,482.40	26.69	26.10	166.52	-80.97	-30.02	341.04	288.56	52.48	6.499			
7,550.00	7,533.86	7,532.68	7,532.08	26.87	26.27	166.61	-81.71	-30.02	346.64	293.81	52.83	6.561			
7,600.00	7,583.56	7,582.37	7,581.76	27.06	26.45	166.71	-82.45	-30.02	352.24	299.05	53.19	6.623			
7,650.00	7,633.25	7,632.05	7,631.43	27.25	26.63	166.80	-83.19	-30.02	357.83	304.29	53.54	6.683			
7,700.00	7,682.94	7,681.73	7,681.11	27.43	26.80	166.88	-83.92	-30.02	363.43	309.54	53.90	6.743			
7,750.00	7,732.64	7,731.41	7,730.79	27.62	26.98	166.97	-84.66	-30.02	369.04	314.79	54.25	6.802			

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Sec 27-T25S-R31E - Lusitano 27_34 Fed Com 622H - Wellbore #1 - Permit Plan 2		Offset Site Error: 0.00 ft	
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.50 ft			
Reference				Offset			Semi Major Axis		Distance					Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Footface (ft)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor					
7,800.00	7,782.33	7,781.10	7,780.46	27.81	27.16	167.05	-85.40	-30.02	374.64	320.03	54.61	6.861					
7,850.00	7,832.02	7,830.78	7,830.14	27.99	27.34	167.13	-86.14	-30.02	380.24	325.28	54.96	6.918					
7,900.00	7,881.71	7,880.46	7,879.82	28.18	27.51	167.21	-86.87	-30.02	385.84	330.53	55.32	6.975					
7,950.00	7,931.41	7,930.14	7,929.50	28.37	27.69	167.28	-87.61	-30.02	391.45	335.77	55.67	7.031					
8,000.00	7,981.10	7,979.83	7,979.17	28.55	27.87	167.35	-88.35	-30.02	397.05	341.02	56.03	7.087					
8,050.00	8,030.79	8,029.51	8,028.85	28.74	28.05	167.43	-89.09	-30.02	402.66	346.27	56.38	7.141					
8,100.00	8,080.49	8,079.19	8,078.53	28.93	28.22	167.49	-89.83	-30.02	408.26	351.52	56.74	7.195					
8,150.00	8,130.18	8,128.87	8,128.20	29.11	28.40	167.56	-90.56	-30.02	413.87	356.77	57.10	7.249					
8,200.00	8,179.87	8,178.55	8,177.88	29.30	28.58	167.63	-91.30	-30.02	419.48	362.02	57.45	7.301					
8,250.00	8,229.56	8,228.24	8,227.56	29.49	28.76	167.69	-92.04	-30.02	425.08	367.28	57.81	7.353					
8,300.00	8,279.26	8,277.92	8,277.23	29.68	28.93	167.75	-92.78	-30.02	430.69	372.53	58.16	7.405					
8,350.00	8,328.95	8,327.60	8,326.91	29.86	29.11	167.81	-93.51	-30.02	436.30	377.78	58.52	7.455					
8,400.00	8,378.64	8,377.28	8,376.59	30.05	29.29	167.87	-94.25	-30.02	441.91	383.03	58.88	7.506					
8,450.00	8,428.34	8,426.97	8,426.26	30.24	29.47	167.93	-94.99	-30.02	447.52	388.28	59.23	7.555					
8,500.00	8,478.03	8,476.65	8,475.94	30.43	29.64	167.98	-95.73	-30.02	453.13	393.54	59.59	7.604					
8,550.00	8,527.72	8,526.33	8,525.62	30.62	29.82	168.04	-96.46	-30.02	458.74	398.79	59.95	7.652					
8,600.00	8,577.41	8,576.01	8,575.30	30.80	30.00	168.09	-97.20	-30.02	464.35	404.05	60.30	7.700					
8,650.00	8,627.11	8,625.70	8,624.97	30.99	30.18	168.14	-97.94	-30.02	469.96	409.30	60.66	7.747					
8,700.00	8,676.80	8,675.38	8,674.65	31.18	30.35	168.19	-98.68	-30.02	475.57	414.55	61.02	7.794					
8,750.00	8,726.49	8,725.06	8,724.33	31.37	30.53	168.24	-99.42	-30.02	481.18	419.81	61.37	7.840					
8,800.00	8,776.19	8,774.74	8,774.00	31.56	30.71	168.29	-100.15	-30.02	486.80	425.06	61.73	7.886					
8,850.00	8,825.88	8,824.43	8,823.68	31.74	30.89	168.34	-100.89	-30.02	492.41	430.32	62.09	7.931					
8,900.00	8,875.57	8,874.11	8,873.36	31.93	31.06	168.39	-101.63	-30.02	498.02	435.58	62.44	7.975					
8,950.00	8,925.26	8,923.79	8,923.03	32.12	31.24	168.43	-102.37	-30.02	503.63	440.83	62.80	8.019					
9,000.00	8,974.96	8,973.47	8,972.71	32.31	31.42	168.48	-103.10	-30.02	509.25	446.09	63.16	8.063					
9,050.00	9,024.65	9,023.16	9,022.39	32.50	31.60	168.52	-103.84	-30.02	514.86	451.34	63.52	8.106					
9,100.00	9,074.34	9,072.84	9,072.06	32.69	31.77	168.56	-104.58	-30.02	520.47	456.60	63.87	8.149					
9,150.00	9,124.04	9,122.52	9,121.74	32.88	31.95	168.60	-105.32	-30.02	526.09	461.86	64.23	8.191					
9,200.00	9,173.73	9,172.20	9,171.42	33.07	32.13	168.64	-106.06	-30.02	531.70	467.12	64.59	8.232					
9,250.00	9,223.42	9,221.89	9,221.10	33.25	32.31	168.68	-106.79	-30.02	537.32	472.37	64.95	8.273					
9,300.00	9,273.11	9,271.57	9,270.77	33.44	32.49	168.72	-107.53	-30.02	542.93	477.63	65.30	8.314					
9,350.00	9,322.81	9,321.25	9,320.45	33.63	32.66	168.76	-108.27	-30.02	548.55	482.89	65.66	8.354					
9,400.00	9,372.50	9,370.93	9,370.13	33.82	32.84	168.80	-109.01	-30.02	554.16	488.15	66.02	8.394					
9,450.00	9,422.19	9,420.61	9,419.80	34.01	33.02	168.83	-109.74	-30.02	559.78	493.40	66.38	8.433					
9,500.00	9,471.89	9,470.30	9,469.48	34.20	33.20	168.87	-110.48	-30.02	565.40	498.66	66.73	8.472					
9,550.00	9,521.58	9,519.98	9,519.16	34.39	33.37	168.90	-111.22	-30.02	571.01	503.92	67.09	8.511					
9,600.00	9,571.27	9,569.66	9,568.83	34.58	33.55	168.94	-111.96	-30.02	576.63	509.18	67.45	8.549					
9,650.00	9,620.96	9,619.34	9,618.51	34.77	33.73	168.97	-112.69	-30.02	582.24	514.44	67.81	8.587					
9,700.00	9,670.66	9,669.03	9,668.19	34.96	33.91	169.00	-113.43	-30.02	587.86	519.70	68.16	8.624					
9,750.00	9,720.35	9,718.71	9,717.86	35.15	34.09	169.04	-114.17	-30.02	593.48	524.95	68.52	8.661					
9,800.00	9,770.04	9,768.39	9,767.54	35.34	34.26	169.07	-114.91	-30.02	599.09	530.21	68.88	8.698					
9,850.00	9,819.74	9,818.08	9,817.22	35.53	34.44	169.10	-115.65	-30.02	604.69	535.45	69.24	8.733					
9,900.00	9,869.48	9,867.81	9,866.95	35.72	34.62	169.14	-116.38	-30.02	609.83	540.23	69.60	8.762					
9,950.00	9,919.29	9,917.61	9,916.74	35.90	34.80	169.16	-117.12	-30.02	614.33	544.37	69.95	8.782					
10,000.00	9,969.15	9,967.46	9,966.59	36.09	34.98	169.17	-117.86	-30.02	618.18	547.87	70.31	8.792					
10,050.00	10,019.05	10,017.35	10,016.48	36.27	35.15	169.17	-118.60	-30.02	621.40	550.73	70.67	8.793					
10,100.00	10,068.99	10,067.29	10,066.40	36.45	35.33	169.15	-119.35	-30.02	623.97	552.95	71.03	8.785					
10,150.00	10,118.96	10,117.25	10,116.36	36.63	35.51	169.12	-120.09	-30.02	625.91	554.52	71.38	8.768					
10,200.00	10,168.95	10,167.23	10,166.33	36.80	35.69	169.08	-120.83	-30.02	627.20	555.46	71.74	8.743					
10,250.00	10,218.94	10,217.22	10,216.32	36.98	35.87	169.02	-121.57	-30.02	627.84	555.75	72.10	8.709					
10,300.00	10,268.94	10,267.21	10,266.31	37.15	36.05	-104.51	-122.31	-30.02	628.05	555.60	72.45	8.669					
10,350.00	10,318.94	10,317.21	10,316.30	37.32	36.23	-104.57	-123.06	-30.02	628.23	555.43	72.80	8.629					

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:
Sec 27-T25S-R31E - Lusitano 27 34 Fed Com 622H - Wellbore #1 - Permit Plan 2													0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:
Reference													0.50 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toeface (ft)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor
10,400.00	10,368.94	10,367.20	10,366.29	37.49	36.41	-104.64	-123.80	-30.02	628.42	555.26	73.16	8.590	
10,450.00	10,418.94	10,417.20	10,416.28	37.67	36.59	-104.70	-124.54	-30.02	628.61	555.10	73.51	8.551	
10,500.00	10,468.94	10,467.19	10,466.26	37.84	36.76	-104.77	-125.28	-30.02	628.80	554.93	73.87	8.513	
10,550.00	10,518.94	10,517.19	10,516.25	38.01	36.94	-104.83	-126.03	-30.02	628.99	554.76	74.22	8.474	
10,600.00	10,568.94	10,567.18	10,566.24	38.19	37.12	-104.90	-126.77	-30.02	629.18	554.60	74.58	8.437	
10,650.00	10,618.91	10,617.16	10,616.22	38.35	37.30	75.13	-127.51	-30.02	629.03	554.10	74.93	8.395	
10,700.00	10,668.59	10,666.92	10,665.97	38.52	37.48	75.68	-128.25	-30.02	627.80	552.54	75.27	8.341	
10,750.00	10,717.59	10,716.06	10,715.10	38.67	37.66	76.69	-128.98	-30.02	625.58	549.98	75.60	8.275	
10,800.00	10,765.54	10,764.21	10,763.25	38.83	37.83	78.14	-129.69	-30.02	622.56	546.63	75.93	8.199	
10,850.00	10,812.08	10,812.33	10,811.37	38.97	38.00	80.05	-130.17	-30.02	618.97	542.72	76.25	8.118	
10,900.00	10,856.86	10,857.52	10,856.56	39.11	38.15	82.27	-130.19	-30.02	615.18	538.63	76.55	8.037	
10,950.00	10,899.53	10,900.19	10,899.23	39.24	38.29	84.68	-130.19	-30.02	611.73	534.90	76.83	7.962	
11,000.00	10,939.76	10,940.42	10,939.46	39.36	38.43	87.17	-130.19	-30.02	609.14	532.04	77.09	7.901	
11,050.00	10,977.26	10,977.92	10,976.96	39.48	38.55	89.62	-130.19	-30.02	607.94	530.59	77.35	7.860	
11,057.93	10,982.94	10,983.60	10,982.64	39.49	38.57	90.00	-130.19	-30.02	607.91	530.53	77.39	7.856	
11,100.00	11,011.74	11,012.40	11,011.44	39.58	38.67	91.90	-130.19	-30.02	608.69	531.10	77.58	7.846	
11,150.00	11,042.93	11,043.59	11,042.63	39.68	38.77	93.87	-130.19	-30.02	611.90	534.10	77.80	7.865	
11,200.00	11,070.60	11,071.26	11,070.30	39.78	38.86	95.41	-130.19	-30.02	618.03	540.03	78.00	7.923	
11,250.00	11,094.53	11,104.81	11,094.23	39.88	38.98	96.41	-130.19	-30.02	627.42	549.21	78.21	8.023	
11,300.00	11,114.55	11,115.21	11,114.25	39.98	39.01	96.79	-130.19	-30.02	640.29	561.97	78.32	8.175	
11,350.00	11,130.50	11,131.16	11,130.20	40.10	39.06	96.47	-130.19	-30.02	656.70	578.26	78.44	8.372	
11,400.00	11,142.26	11,142.92	11,141.96	40.22	39.10	95.38	-130.19	-30.02	676.57	598.05	78.53	8.616	
11,450.00	11,149.74	11,150.41	11,149.44	40.35	39.13	93.47	-130.19	-30.02	699.68	621.10	78.58	8.904	
11,500.00	11,152.89	11,153.55	11,152.59	40.48	39.14	90.72	-130.19	-30.02	725.67	647.06	78.60	9.232	
11,550.00	11,153.00	11,153.66	11,152.70	40.63	39.14	90.00	-130.19	-30.02	754.14	675.52	78.61	9.593	
11,600.00	11,153.00	11,153.66	11,152.70	40.78	39.14	90.00	-130.19	-30.02	784.76	706.15	78.61	9.983	
11,650.00	11,153.00	11,153.66	11,152.70	40.95	39.14	90.00	-130.19	-30.02	817.30	738.68	78.62	10.396	
11,700.00	11,153.00	11,153.66	11,152.70	41.12	39.14	90.00	-130.19	-30.02	851.53	772.92	78.61	10.832	
11,750.00	11,153.00	12,143.78	11,747.99	41.32	42.79	134.13	-770.90	-36.24	855.02	785.06	69.96	12.222	
11,800.00	11,153.00	12,206.22	11,747.99	41.52	43.04	134.11	-820.90	-36.73	855.35	785.02	70.33	12.162	
11,850.00	11,153.00	12,243.78	11,747.99	41.73	43.20	134.08	-870.89	-37.21	855.67	785.01	70.66	12.110	
11,900.00	11,153.00	12,306.22	11,747.99	41.95	43.48	134.06	-920.89	-37.70	856.00	784.93	71.07	12.044	
11,950.00	11,153.00	12,343.77	11,747.99	42.19	43.66	134.04	-970.88	-38.18	856.32	784.89	71.43	11.988	
12,000.00	11,153.00	12,406.23	11,747.99	42.44	43.96	134.02	-1,020.88	-38.67	856.65	784.76	71.88	11.917	
12,050.00	11,153.00	12,443.77	11,747.99	42.70	44.16	134.00	-1,070.88	-39.15	856.97	784.70	72.27	11.857	
12,100.00	11,153.00	12,506.23	11,747.99	42.96	44.49	133.98	-1,120.87	-39.64	857.30	784.54	72.76	11.782	
12,150.00	11,153.00	12,543.77	11,747.99	43.24	44.70	133.96	-1,170.87	-40.13	857.63	784.44	73.18	11.719	
12,200.00	11,153.00	12,606.24	11,747.99	43.53	45.06	133.94	-1,220.86	-40.61	857.95	784.24	73.71	11.639	
12,250.00	11,153.00	12,643.76	11,747.99	43.83	45.28	133.92	-1,270.86	-41.10	858.28	784.12	74.16	11.574	
12,300.00	11,153.00	12,706.24	11,747.99	44.14	45.66	133.90	-1,320.85	-41.58	858.61	783.88	74.72	11.491	
12,350.00	11,153.00	12,743.76	11,747.99	44.46	45.90	133.87	-1,370.85	-42.07	858.93	783.74	75.20	11.423	
12,400.00	11,153.00	12,806.24	11,747.99	44.78	46.31	133.85	-1,420.84	-42.55	859.26	783.47	75.79	11.337	
12,450.00	11,153.00	12,843.75	11,747.99	45.12	46.56	133.83	-1,470.84	-43.04	859.59	783.29	76.29	11.267	
12,500.00	11,153.00	12,906.25	11,747.99	45.46	46.99	133.81	-1,520.84	-43.52	859.91	782.99	76.92	11.179	
12,550.00	11,153.00	12,943.75	11,747.99	45.82	47.25	133.79	-1,570.83	-44.01	860.24	782.79	77.45	11.107	
12,600.00	11,153.00	13,006.25	11,747.99	46.18	47.70	133.77	-1,620.83	-44.49	860.57	782.46	78.11	11.017	
12,650.00	11,153.00	13,043.75	11,747.99	46.56	47.98	133.75	-1,670.82	-44.98	860.89	782.24	78.66	10.945	
12,700.00	11,153.00	13,106.26	11,747.99	46.93	48.45	133.73	-1,720.82	-45.47	861.22	781.87	79.35	10.853	
12,750.00	11,153.00	13,143.74	11,747.99	47.33	48.74	133.71	-1,770.81	-45.95	861.55	781.63	79.92	10.780	
12,800.00	11,153.00	13,206.26	11,747.99	47.72	49.22	133.69	-1,820.81	-46.44	861.88	781.23	80.65	10.687	
12,850.00	11,153.00	13,243.74	11,747.99	48.13	49.52	133.67	-1,870.80	-46.92	862.21	780.97	81.24	10.613	
12,900.00	11,153.00	13,306.26	11,747.99	48.53	50.03	133.64	-1,920.80	-47.41	862.53	780.54	81.99	10.520	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:
Sec 27-T25S-R31E - Lusitano 27_34 Fed Com 622H - Wellbore #1 - Permit Plan 2													0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:
													0.50 ft
Reference													Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/S (ft)	+E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor
12,950.00	11,153.00	13,343.73	11,747.99	48.96	50.34	133.62	-1,970.80	-47.89	862.86	780.26	82.60	10.446	
13,000.00	11,153.00	13,406.27	11,747.99	49.38	50.87	133.60	-2,020.79	-48.38	863.19	779.81	83.38	10.352	
13,050.00	11,153.00	13,443.73	11,747.99	49.81	51.19	133.58	-2,070.79	-48.86	863.52	779.51	84.01	10.279	
13,100.00	11,153.00	13,506.27	11,747.99	50.25	51.73	133.56	-2,120.78	-49.35	863.85	779.03	84.82	10.185	
13,150.00	11,153.00	13,543.73	11,747.99	50.70	52.06	133.54	-2,170.78	-49.83	864.17	778.71	85.47	10.111	
13,200.00	11,153.00	13,606.28	11,747.99	51.15	52.62	133.52	-2,220.77	-50.32	864.50	778.21	86.29	10.018	
13,250.00	11,153.00	13,643.72	11,747.99	51.61	52.96	133.50	-2,270.77	-50.81	864.83	777.87	86.96	9.945	
13,300.00	11,153.00	13,706.28	11,747.99	52.07	53.53	133.48	-2,320.77	-51.29	865.16	777.35	87.81	9.852	
13,350.00	11,153.00	13,743.72	11,747.99	52.54	53.88	133.46	-2,370.76	-51.78	865.49	776.99	88.50	9.780	
13,400.00	11,153.00	13,806.29	11,747.99	53.02	54.47	133.44	-2,420.76	-52.26	865.82	776.45	89.37	9.688	
13,450.00	11,153.00	13,843.71	11,747.99	53.50	54.82	133.42	-2,470.75	-52.75	866.15	776.07	90.07	9.616	
13,500.00	11,153.00	13,906.29	11,747.99	53.98	55.42	133.40	-2,520.75	-53.23	866.48	775.51	90.97	9.525	
13,550.00	11,153.00	13,943.71	11,747.99	54.48	55.79	133.38	-2,570.74	-53.72	866.81	775.12	91.68	9.454	
13,600.00	11,153.00	14,006.29	11,747.99	54.98	56.40	133.36	-2,620.74	-54.20	867.14	774.54	92.60	9.364	
13,650.00	11,153.00	14,043.70	11,747.99	55.48	56.78	133.33	-2,670.73	-54.69	867.47	774.13	93.33	9.295	
13,700.00	11,153.00	14,106.30	11,747.99	55.99	57.40	133.31	-2,720.73	-55.18	867.79	773.53	94.26	9.206	
13,750.00	11,153.00	14,143.70	11,747.99	56.50	57.78	133.29	-2,770.73	-55.66	868.12	773.12	95.01	9.137	
13,800.00	11,153.00	14,206.30	11,747.99	57.01	58.42	133.27	-2,820.72	-56.15	868.45	772.49	95.96	9.050	
13,850.00	11,153.00	14,243.70	11,747.99	57.54	58.81	133.25	-2,870.72	-56.63	868.78	772.07	96.72	8.983	
13,900.00	11,153.00	14,306.31	11,747.99	58.06	59.45	133.23	-2,920.71	-57.12	869.11	771.43	97.69	8.897	
13,950.00	11,153.00	14,343.69	11,747.99	58.59	59.85	133.21	-2,970.71	-57.60	869.44	770.99	98.46	8.831	
14,000.00	11,153.00	14,406.31	11,747.99	59.13	60.51	133.19	-3,020.70	-58.09	869.78	770.33	99.44	8.746	
14,050.00	11,153.00	14,443.69	11,747.99	59.67	60.90	133.17	-3,070.70	-58.57	870.11	769.88	100.23	8.681	
14,100.00	11,153.00	14,506.31	11,747.99	60.21	61.57	133.15	-3,120.69	-59.06	870.44	769.21	101.23	8.599	
14,150.00	11,153.00	14,543.68	11,747.99	60.75	61.98	133.13	-3,170.69	-59.54	870.77	768.74	102.02	8.535	
14,200.00	11,153.00	14,606.32	11,747.99	61.30	62.66	133.11	-3,220.69	-60.03	871.10	768.06	103.04	8.454	
14,250.00	11,153.00	14,643.68	11,747.99	61.86	63.07	133.09	-3,270.68	-60.52	871.43	767.59	103.84	8.392	
14,300.00	11,153.00	14,706.32	11,747.99	62.41	63.76	133.07	-3,320.68	-61.00	871.76	766.89	104.87	8.312	
14,350.00	11,153.00	14,743.68	11,747.99	62.98	64.17	133.05	-3,370.67	-61.49	872.09	766.40	105.69	8.251	
14,400.00	11,153.00	14,806.33	11,747.99	63.54	64.87	133.03	-3,420.67	-61.97	872.42	765.69	106.73	8.174	
14,450.00	11,153.00	14,843.67	11,747.99	64.11	65.29	133.01	-3,470.66	-62.46	872.75	765.19	107.56	8.114	
14,500.00	11,153.00	14,906.33	11,747.99	64.67	65.99	132.99	-3,520.66	-62.94	873.08	764.47	108.62	8.038	
14,550.00	11,153.00	14,943.67	11,747.99	65.25	66.42	132.97	-3,570.65	-63.43	873.42	763.97	109.45	7.980	
14,600.00	11,153.00	15,006.33	11,747.99	65.82	67.13	132.95	-3,620.65	-63.91	873.75	763.23	110.52	7.906	
14,650.00	11,153.00	15,043.66	11,747.99	66.41	67.56	132.93	-3,670.65	-64.40	874.08	762.72	111.36	7.849	
14,700.00	11,153.00	15,106.34	11,747.99	66.99	68.28	132.91	-3,720.64	-64.88	874.41	761.97	112.44	7.776	
14,750.00	11,153.00	15,143.66	11,747.99	67.57	68.71	132.89	-3,770.64	-65.37	874.74	761.45	113.30	7.721	
14,800.00	11,153.00	15,206.34	11,747.99	68.16	69.44	132.87	-3,820.63	-65.86	875.08	760.69	114.39	7.650	
14,850.00	11,153.00	15,243.66	11,747.99	68.75	69.88	132.85	-3,870.63	-66.34	875.41	760.16	115.25	7.595	
14,900.00	11,153.00	15,306.35	11,747.99	69.34	70.61	132.83	-3,920.62	-66.83	875.74	759.39	116.35	7.527	
14,950.00	11,153.00	15,343.65	11,747.99	69.94	71.05	132.81	-3,970.62	-67.31	876.07	758.85	117.22	7.474	
15,000.00	11,153.00	15,406.35	11,747.99	70.53	71.79	132.79	-4,020.62	-67.80	876.41	758.07	118.33	7.406	
15,050.00	11,153.00	15,443.65	11,747.99	71.14	72.23	132.77	-4,070.61	-68.28	876.74	757.53	119.21	7.355	
15,100.00	11,153.00	15,506.36	11,747.99	71.74	72.98	132.75	-4,120.61	-68.77	877.07	756.74	120.33	7.289	
15,150.00	11,153.00	15,543.64	11,747.99	72.34	73.43	132.73	-4,170.60	-69.25	877.40	756.19	121.21	7.238	
15,200.00	11,153.00	15,606.36	11,747.99	72.95	74.18	132.71	-4,220.60	-69.74	877.74	755.39	122.35	7.174	
15,250.00	11,153.00	15,643.64	11,747.99	73.56	74.63	132.69	-4,270.59	-70.23	878.07	754.83	123.24	7.125	
15,300.00	11,153.00	15,706.36	11,747.99	74.17	75.39	132.67	-4,320.59	-70.71	878.40	754.03	124.38	7.062	
15,350.00	11,153.00	15,743.64	11,747.99	74.78	75.84	132.65	-4,370.58	-71.20	878.74	753.46	125.27	7.015	
15,400.00	11,153.00	15,806.37	11,747.99	75.40	76.61	132.63	-4,420.58	-71.68	879.07	752.65	126.42	6.953	
15,450.00	11,153.00	15,843.63	11,747.99	76.02	77.06	132.61	-4,470.58	-72.17	879.40	752.08	127.33	6.907	
15,500.00	11,153.00	15,906.37	11,747.99	76.63	77.83	132.59	-4,520.57	-72.65	879.74	751.25	128.48	6.847	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset-TVD Reference:	Offset Datum

Offset Design													Offset Site Error:
Sec 27-T25S-R31E - Lusitano 27-34 Fed Com 622H - Wellbore #1 - Permit Plan 2													0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:
													0.50 ft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre N-S (ft)	Offset Wellbore Centre E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
15,550.00	11,153.00	15,943.63	11,747.99	77.26	78.29	132.57	-4,570.57	-73.14	880.07	750.68	129.39	6.802	
15,600.00	11,153.00	16,006.38	11,747.99	77.88	79.06	132.55	-4,620.56	-73.62	880.40	749.85	130.56	6.743	
15,650.00	11,153.00	16,043.62	11,747.99	78.50	79.52	132.53	-4,670.56	-74.11	880.74	749.27	131.47	6.699	
15,700.00	11,153.00	16,106.38	11,747.99	79.13	80.30	132.51	-4,720.55	-74.59	881.07	748.43	132.65	6.642	
15,750.00	11,153.00	16,143.62	11,747.99	79.76	80.77	132.49	-4,770.55	-75.08	881.41	747.84	133.57	6.599	
15,800.00	11,153.00	16,206.38	11,747.99	80.39	81.55	132.47	-4,820.54	-75.57	881.74	746.99	134.75	6.544	
15,850.00	11,153.00	16,243.61	11,747.99	81.02	82.01	132.45	-4,870.54	-76.05	882.08	746.40	135.67	6.502	
15,900.00	11,153.00	16,306.39	11,747.99	81.65	82.80	132.43	-4,920.54	-76.54	882.41	745.55	136.86	6.448	
15,950.00	11,153.00	16,343.61	11,747.99	82.29	83.27	132.41	-4,970.53	-77.02	882.74	744.95	137.79	6.406	
16,000.00	11,153.00	16,406.39	11,747.99	82.92	84.06	132.39	-5,020.53	-77.51	883.08	744.09	138.98	6.354	
16,050.00	11,153.00	16,443.61	11,747.99	83.56	84.53	132.37	-5,070.52	-77.99	883.41	743.49	139.92	6.314	
16,100.00	11,153.00	16,506.40	11,747.99	84.20	85.33	132.35	-5,120.52	-78.48	883.75	742.63	141.12	6.262	
16,150.00	11,153.00	16,543.60	11,747.99	84.84	85.80	132.33	-5,170.51	-78.96	884.08	742.02	142.06	6.223	
16,200.00	11,153.00	16,606.40	11,747.99	85.48	86.60	132.31	-5,220.51	-79.45	884.42	741.15	143.27	6.173	
16,250.00	11,153.00	16,643.60	11,747.99	86.12	87.07	132.29	-5,270.51	-79.93	884.75	740.54	144.21	6.135	
16,300.00	11,153.00	16,706.40	11,747.99	86.77	87.87	132.27	-5,320.50	-80.42	885.09	739.66	145.42	6.086	
16,350.00	11,153.00	16,743.59	11,747.99	87.41	88.35	132.25	-5,370.50	-80.91	885.42	739.05	146.37	6.049	
16,400.00	11,153.00	16,806.41	11,747.99	88.06	89.15	132.23	-5,420.49	-81.39	885.76	738.17	147.59	6.001	
16,450.00	11,153.00	16,843.59	11,747.99	88.71	89.63	132.21	-5,470.49	-81.88	886.10	737.55	148.55	5.965	
16,500.00	11,153.00	16,906.41	11,747.99	89.36	90.44	132.19	-5,520.48	-82.36	886.43	736.66	149.77	5.919	
16,550.00	11,153.00	16,943.59	11,747.99	90.01	90.92	132.17	-5,570.48	-82.85	886.77	736.04	150.73	5.883	
16,600.00	11,153.00	17,006.42	11,747.99	90.66	91.73	132.15	-5,620.47	-83.33	887.10	735.15	151.96	5.838	
16,650.00	11,153.00	17,043.58	11,747.99	91.31	92.21	132.13	-5,670.47	-83.82	887.44	734.52	152.92	5.803	
16,700.00	11,153.00	17,106.42	11,747.99	91.96	93.03	132.11	-5,720.47	-84.30	887.78	733.62	154.15	5.759	
16,750.00	11,153.00	17,143.58	11,747.99	92.62	93.51	132.09	-5,770.46	-84.79	888.11	732.99	155.12	5.725	
16,800.00	11,153.00	17,206.43	11,747.99	93.28	94.33	132.07	-5,820.46	-85.27	888.45	732.09	156.36	5.682	
16,850.00	11,153.00	17,243.57	11,747.99	93.93	94.81	132.05	-5,870.45	-85.76	888.78	731.46	157.33	5.649	
16,900.00	11,153.00	17,306.43	11,747.99	94.59	95.63	132.03	-5,920.45	-86.25	889.12	730.55	158.57	5.607	
16,950.00	11,153.00	17,343.57	11,747.99	95.25	96.12	132.01	-5,970.44	-86.73	889.46	729.92	159.54	5.575	
17,000.00	11,153.00	17,393.57	11,747.99	95.91	96.77	131.99	-6,020.44	-87.22	889.79	729.14	160.65	5.539	
17,050.00	11,153.00	17,422.76	11,747.99	96.57	97.16	131.98	-6,049.63	-87.50	890.37	729.05	161.32	5.519	
17,100.00	11,153.00	17,422.76	11,747.99	97.23	97.16	131.98	-6,049.63	-87.50	893.28	732.18	161.10	5.545	
17,150.00	11,153.00	17,422.76	11,747.99	97.89	97.16	131.98	-6,049.63	-87.50	898.96	738.43	160.53	5.600	
17,200.00	11,153.00	17,422.76	11,747.99	98.56	97.16	131.98	-6,049.63	-87.50	907.36	747.75	159.61	5.685	
17,250.00	11,153.00	17,422.76	11,747.99	99.22	97.16	131.98	-6,049.63	-87.50	918.42	760.03	158.39	5.798	
17,300.00	11,153.00	17,422.76	11,747.99	99.89	97.16	131.98	-6,049.63	-87.50	932.02	775.13	156.89	5.941	
17,327.72	11,153.00	17,422.76	11,747.99	100.26	97.16	131.98	-6,049.63	-87.50	940.63	784.67	155.96	6.031	

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design											Offset Site Error:		0.00 ft
Sec 27-T25S-R31E - Lusitano 27_34 Fed Com 713H - Wellbore #1 - Permit Plan 2											Offset Well Error:		0.50 ft
Survey Program: 0-MWD+HDCM													
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Footface (ft)	Offset Wellbore Centre N/S (ft)	Offset Wellbore Centre E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.20	-0.20	0.50	0.50	89.62	0.20	29.96	29.96				
50.00	50.00	49.80	49.80	0.50	0.50	89.62	0.20	29.96	29.96	28.95	1.01	29.768	
100.00	100.00	100.20	99.80	0.52	0.52	89.62	0.20	29.96	29.96	28.93	1.04	28.928	
150.00	150.00	149.80	149.80	0.59	0.59	89.62	0.20	29.96	29.96	28.78	1.18	25.388	
200.00	200.00	200.20	199.80	0.70	0.70	89.62	0.20	29.96	29.96	28.56	1.40	21.329	
250.00	250.00	249.80	249.80	0.84	0.84	89.62	0.20	29.96	29.96	28.29	1.67	17.889	
300.00	300.00	300.20	299.80	0.99	0.99	89.62	0.20	29.96	29.96	27.99	1.98	15.168	
350.00	350.00	349.80	349.80	1.15	1.14	89.62	0.20	29.96	29.96	27.67	2.29	13.081	
400.00	400.00	400.20	399.80	1.31	1.31	89.62	0.20	29.96	29.96	27.34	2.52	11.440	
450.00	450.00	449.80	449.80	1.48	1.48	89.62	0.20	29.96	29.96	27.01	2.95	10.149	
500.00	500.00	500.20	499.80	1.65	1.65	89.62	0.20	29.96	29.96	26.67	3.29	9.099	
550.00	550.00	549.80	549.80	1.82	1.82	89.62	0.20	29.96	29.96	26.33	3.63	8.243	
600.00	600.00	600.20	599.80	1.99	1.99	89.62	0.20	29.96	29.96	25.98	3.98	7.524	
650.00	650.00	649.80	649.80	2.16	2.16	89.62	0.20	29.96	29.96	25.63	4.33	6.922	
700.00	700.00	700.20	699.80	2.34	2.34	89.62	0.20	29.96	29.96	25.28	4.68	6.403	
750.00	750.00	749.80	749.80	2.51	2.51	89.62	0.20	29.96	29.96	24.93	5.03	5.958	
800.00	800.00	800.20	799.80	2.69	2.69	89.62	0.20	29.96	29.96	24.58	5.38	5.567	
850.00	850.00	849.80	849.80	2.87	2.87	89.62	0.20	29.96	29.96	24.23	5.73	5.226	
900.00	900.00	900.20	899.80	3.04	3.04	89.62	0.20	29.96	29.96	23.87	6.09	4.921	Alert
950.00	950.00	949.80	949.80	3.22	3.22	89.62	0.20	29.96	29.96	23.52	6.44	4.652	Alert
1,000.00	1,000.00	1,000.20	999.80	3.40	3.40	89.62	0.20	29.96	29.96	23.16	6.80	4.409	Alert
1,050.00	1,050.00	1,049.80	1,049.80	3.58	3.57	89.62	0.20	29.96	29.96	22.81	7.15	4.191	Alert
1,100.00	1,100.00	1,100.20	1,099.80	3.75	3.75	89.62	0.20	29.96	29.96	22.45	7.51	3.992	Alert
1,150.00	1,150.00	1,149.80	1,149.80	3.93	3.93	89.62	0.20	29.96	29.96	22.10	7.86	3.812	Alert
1,200.00	1,200.00	1,200.20	1,199.80	4.11	4.11	89.62	0.20	29.96	29.96	21.74	8.22	3.646	Alert
1,250.00	1,250.00	1,249.80	1,249.80	4.29	4.29	89.62	0.20	29.96	29.96	21.39	8.57	3.495	Alert
1,300.00	1,300.00	1,300.20	1,299.80	4.46	4.46	89.62	0.20	29.96	29.96	21.03	8.93	3.355	Alert
1,350.00	1,350.00	1,349.80	1,349.80	4.64	4.64	89.62	0.20	29.96	29.96	20.68	9.28	3.227	Alert
1,400.00	1,400.00	1,400.20	1,399.80	4.82	4.82	89.62	0.20	29.96	29.96	20.32	9.64	3.107	Alert
1,450.00	1,450.00	1,449.80	1,449.80	5.00	5.00	89.62	0.20	29.96	29.96	19.96	10.00	2.997	Alert
1,500.00	1,500.00	1,500.20	1,499.80	5.18	5.18	89.62	0.20	29.96	29.96	19.61	10.36	2.893	Alert
1,550.00	1,550.00	1,549.80	1,549.80	5.36	5.35	89.62	0.20	29.96	29.96	19.25	10.71	2.797	Alert
1,600.00	1,600.00	1,600.20	1,599.80	5.53	5.53	89.62	0.20	29.96	29.96	18.89	11.07	2.707	Alert
1,650.00	1,650.00	1,649.80	1,649.80	5.71	5.71	89.62	0.20	29.96	29.96	18.54	11.42	2.622	Alert
1,700.00	1,700.00	1,700.20	1,699.80	5.89	5.89	89.62	0.20	29.96	29.96	18.18	11.78	2.543	Alert
1,750.00	1,750.00	1,749.80	1,749.80	6.07	6.07	89.62	0.20	29.96	29.96	17.82	12.14	2.468	Minor Risk
1,800.00	1,800.00	1,800.20	1,799.80	6.25	6.25	89.62	0.20	29.96	29.96	17.46	12.50	2.397	Minor Risk
1,850.00	1,850.00	1,849.80	1,849.80	6.43	6.43	89.62	0.20	29.96	29.96	17.11	12.85	2.331	Minor Risk
1,900.00	1,900.00	1,900.20	1,899.80	6.61	6.61	89.62	0.20	29.96	29.96	16.75	13.21	2.268	Minor Risk
1,950.00	1,950.00	1,949.80	1,949.80	6.78	6.78	89.62	0.20	29.96	29.96	16.39	13.57	2.208	Minor Risk
2,000.00	2,000.00	2,000.20	1,999.80	6.96	6.96	89.62	0.20	29.96	29.96	16.03	13.93	2.151	Minor Risk
2,050.00	2,050.00	2,049.80	2,049.80	7.14	7.14	89.62	0.20	29.96	29.96	15.68	14.28	2.098	Minor Risk
2,100.00	2,100.00	2,100.20	2,099.80	7.32	7.32	89.62	0.20	29.96	29.96	15.32	14.64	2.046	Minor Risk
2,150.00	2,150.00	2,149.80	2,149.80	7.50	7.50	89.62	0.20	29.96	29.96	14.96	15.00	1.998	Minor Risk
2,200.00	2,200.00	2,200.20	2,199.80	7.68	7.68	89.62	0.20	29.96	29.96	14.60	15.36	1.951	Minor Risk
2,250.00	2,250.00	2,249.80	2,249.80	7.86	7.86	89.62	0.20	29.96	29.96	14.25	15.71	1.907	Minor Risk
2,300.00	2,300.00	2,300.20	2,299.80	8.04	8.04	89.62	0.20	29.96	29.96	13.89	16.07	1.864	Minor Risk
2,350.00	2,350.00	2,349.80	2,349.80	8.22	8.21	89.62	0.20	29.96	29.96	13.53	16.43	1.824	Minor Risk
2,400.00	2,400.00	2,400.20	2,399.80	8.39	8.39	89.62	0.20	29.96	29.96	13.17	16.79	1.785	Minor Risk
2,450.00	2,450.00	2,449.80	2,449.80	8.57	8.57	89.62	0.20	29.96	29.96	12.82	17.15	1.747	Minor Risk
2,500.00	2,500.00	2,499.80	2,499.80	8.75	8.75	89.62	0.20	29.96	29.96	12.46	17.50	1.712	Minor Risk, CC
2,550.00	2,550.00	2,549.49	2,549.49	8.93	8.93	89.46	0.29	30.21	30.22	12.36	17.86	1.692	Minor Risk, ES, SF

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Sec 27-T25S-R31E - Lusitano 27_34 Fed Com 713H - Wellbore #1 - Permit Plan 2		Offset Site Error: 0.00 ft	
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.50 ft			
Reference		Offset		Semi-Major Axis		Distance											
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Footcage	Offset Wellbore Centre N/S	Offset Wellbore Centre E/W	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning				
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)						
2,600.00	2,600.00	2,599.17	2,599.16	9.11	9.10	89.00	0.54	30.98	30.99	12.78	18.21	1.702	Minor Risk				
2,650.00	2,650.00	2,648.82	2,648.80	9.29	9.27	88.27	0.97	32.25	32.28	13.73	18.55	1.740	Minor Risk				
2,700.00	2,700.00	2,698.44	2,698.38	9.47	9.45	87.35	1.57	34.03	34.10	15.20	18.90	1.804	Minor Risk				
2,750.00	2,750.00	2,748.02	2,747.90	9.65	9.62	86.30	2.35	36.32	36.44	17.20	19.24	1.894	Minor Risk				
2,800.00	2,800.00	2,797.53	2,797.32	9.83	9.79	85.19	3.29	39.11	39.32	19.74	19.58	2.008	Minor Risk				
2,850.00	2,850.00	2,847.15	2,846.82	10.00	9.96	84.08	4.39	42.37	42.70	22.78	19.93	2.143	Minor Risk				
2,900.00	2,900.00	2,902.98	2,896.56	10.18	10.16	83.11	5.53	45.75	46.20	25.90	20.30	2.276	Minor Risk				
2,950.00	2,950.00	2,946.89	2,946.31	10.36	10.31	82.27	6.67	49.13	49.71	29.08	20.63	2.410	Minor Risk				
3,000.00	3,000.00	3,003.24	2,996.05	10.54	10.51	81.54	7.81	52.51	53.22	32.22	21.00	2.534	Alert				
3,050.00	3,050.00	3,046.64	3,045.80	10.72	10.67	80.90	8.96	55.89	56.75	35.41	21.33	2.660	Alert				
3,100.00	3,100.00	3,103.49	3,095.54	10.90	10.87	80.33	10.10	59.27	60.28	38.57	21.71	2.776	Alert				
3,150.00	3,150.00	3,146.38	3,145.28	11.08	11.02	79.83	11.24	62.65	63.81	41.78	22.04	2.895	Alert				
3,200.00	3,200.00	3,203.75	3,195.03	11.26	11.22	79.38	12.38	66.04	67.35	44.94	22.42	3.004	Alert				
3,250.00	3,250.00	3,246.12	3,244.77	11.44	11.37	78.98	13.52	69.42	70.90	48.15	22.75	3.117	Alert				
3,300.00	3,300.00	3,304.00	3,294.52	11.62	11.58	78.61	14.66	72.80	74.45	51.32	23.13	3.219	Alert				
3,350.00	3,350.00	3,345.87	3,344.26	11.80	11.73	78.28	15.80	76.18	78.00	54.54	23.45	3.325	Alert				
3,400.00	3,400.00	3,404.26	3,394.00	11.97	11.94	77.98	16.94	79.56	81.55	57.71	23.84	3.421	Alert				
3,450.00	3,450.00	3,445.61	3,443.75	12.15	12.08	77.70	18.08	82.94	85.10	60.94	24.16	3.522	Alert				
3,500.00	3,500.00	3,504.52	3,493.48	12.33	12.29	77.44	19.23	86.32	88.66	64.11	24.55	3.612	Alert				
3,550.00	3,550.00	3,545.36	3,543.24	12.51	12.44	77.21	20.37	89.70	92.22	67.34	24.87	3.708	Alert				
3,600.00	3,600.00	3,604.77	3,592.98	12.69	12.65	76.99	21.51	93.08	95.77	70.52	25.26	3.792	Alert				
3,650.00	3,650.00	3,645.10	3,642.73	12.87	12.80	76.79	22.65	96.46	99.33	73.75	25.58	3.883	Alert				
3,700.00	3,700.00	3,705.03	3,692.47	13.05	13.01	76.60	23.79	99.84	102.90	76.93	25.97	3.962	Alert				
3,750.00	3,750.00	3,744.84	3,742.21	13.23	13.15	76.42	24.93	103.22	106.46	80.17	26.29	4.049	Alert				
3,800.00	3,800.00	3,805.29	3,791.96	13.41	13.37	76.26	26.07	106.60	110.02	83.34	26.68	4.123	Alert				
3,850.00	3,850.00	3,844.59	3,841.70	13.59	13.51	76.10	27.21	109.98	113.59	86.59	27.00	4.207	Alert				
3,900.00	3,900.00	3,905.54	3,891.45	13.77	13.73	75.96	28.36	113.36	117.15	89.76	27.39	4.276	Alert				
3,950.00	3,950.00	3,944.33	3,941.19	13.94	13.87	75.82	29.50	116.74	120.72	93.01	27.71	4.356	Alert				
4,000.00	4,000.00	4,005.80	3,990.93	14.12	14.09	75.69	30.64	120.12	124.28	96.18	28.11	4.422	Alert				
4,050.00	4,050.00	4,044.07	4,040.68	14.30	14.23	75.57	31.78	123.50	127.85	99.43	28.42	4.498	Alert				
4,100.00	4,100.00	4,106.05	4,090.42	14.48	14.45	75.46	32.92	126.88	131.42	102.60	28.82	4.560	Alert				
4,150.00	4,150.00	4,143.82	4,140.17	14.66	14.59	75.35	34.06	130.26	134.99	105.85	29.13	4.633	Alert				
4,200.00	4,200.00	4,206.31	4,189.91	14.84	14.82	75.24	35.20	133.64	138.56	109.02	29.53	4.691	Alert				
4,250.00	4,250.00	4,243.56	4,239.65	15.02	14.95	75.15	36.34	137.02	142.12	112.28	29.85	4.762	Alert				
4,300.00	4,300.00	4,293.43	4,289.40	15.20	15.13	75.05	37.49	140.40	145.69	115.49	30.20	4.824	Alert				
4,350.00	4,350.00	4,343.31	4,339.14	15.38	15.31	74.96	38.63	143.78	149.26	118.71	30.56	4.885	Alert				
4,400.00	4,400.00	4,406.82	4,388.89	15.56	15.54	74.88	39.77	147.17	152.83	121.87	30.96	4.936	Alert				
4,450.00	4,450.00	4,443.05	4,438.63	15.74	15.67	74.80	40.91	150.55	156.40	125.13	31.27	5.002					
4,500.00	4,500.00	4,507.08	4,488.38	15.92	15.91	74.72	42.05	153.93	159.97	128.30	31.68	5.050					
4,550.00	4,550.00	4,542.81	4,538.13	16.09	16.04	74.64	43.19	157.31	163.33	131.35	31.98	5.107					
4,600.00	4,600.00	4,607.28	4,587.92	16.26	16.27	74.56	44.33	160.69	166.27	133.88	32.38	5.134					
4,650.00	4,649.98	4,642.86	4,637.73	16.44	16.40	74.48	45.48	164.08	168.77	136.09	32.68	5.164					
4,700.00	4,699.96	4,707.39	4,687.55	16.61	16.63	74.40	46.62	167.46	170.85	137.77	33.08	5.165					
4,750.00	4,749.92	4,742.58	4,737.39	16.78	16.76	74.32	47.76	170.85	172.51	139.13	33.38	5.168					
4,800.00	4,799.86	4,807.44	4,787.24	16.95	17.00	74.24	48.91	174.24	173.75	139.97	33.78	5.143					
4,850.00	4,849.78	4,842.55	4,837.10	17.12	17.13	74.16	50.05	177.62	174.56	140.48	34.08	5.122					
4,900.00	4,899.68	4,907.46	4,886.97	17.30	17.36	74.08	51.19	181.01	174.95	140.47	34.48	5.074					
4,950.00	4,949.54	4,942.53	4,936.83	17.47	17.49	74.00	52.34	184.40	174.92	140.14	34.78	5.030					
5,000.00	4,999.37	5,007.49	4,986.69	17.64	17.73	73.92	53.48	187.79	174.48	139.29	35.18	4.959	Alert				
5,050.00	5,049.16	5,042.49	5,036.54	17.82	17.85	73.84	54.63	191.18	173.61	138.13	35.48	4.893	Alert				
5,100.00	5,098.90	5,107.54	5,086.38	17.99	18.09	73.76	55.77	194.56	172.34	136.45	35.88	4.802	Alert				
5,150.00	5,148.61	5,142.41	5,136.20	18.16	18.22	73.68	56.91	197.95	170.67	134.48	36.18	4.717	Alert				

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error: 0.00 ft	
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.50 ft	
Sec 27-T25S-R31E - Lusitano 27 34 Fed Com 713H - Wellbore #1 - Permit Plan 2															
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (ft)	+E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
5,200.00	5,198.30	5,207.64	5,186.02	18.34	18.46	-15.74	58.05	201.34	168.90	132.31	36.59	4.616	Alert		
5,250.00	5,247.99	5,242.30	5,235.84	18.52	18.58	-16.24	59.20	204.72	167.15	130.27	36.89	4.532	Alert		
5,300.00	5,297.69	5,307.75	5,285.66	18.69	18.82	-16.75	60.34	208.11	165.41	128.12	37.29	4.438	Alert		
5,350.00	5,347.38	5,342.20	5,335.48	18.87	18.95	-17.28	61.48	211.49	163.69	126.10	37.59	4.355	Alert		
5,400.00	5,397.07	5,407.85	5,385.30	19.04	19.19	-17.81	62.63	214.88	161.98	123.98	38.00	4.263	Alert		
5,450.00	5,446.77	5,442.09	5,435.12	19.22	19.31	-18.36	63.77	218.26	160.29	121.99	38.30	4.185	Alert		
5,500.00	5,496.46	5,507.96	5,484.94	19.40	19.55	-18.92	64.91	221.65	158.60	119.90	38.71	4.098	Alert		
5,550.00	5,546.15	5,541.99	5,534.76	19.58	19.68	-19.49	66.06	225.03	156.94	117.93	39.01	4.024	Alert		
5,600.00	5,595.84	5,608.06	5,584.58	19.75	19.92	-20.07	67.20	228.42	155.29	115.87	39.42	3.940	Alert		
5,650.00	5,645.54	5,641.89	5,634.40	19.93	20.04	-20.67	68.34	231.81	153.66	113.94	39.71	3.869	Alert		
5,700.00	5,695.23	5,691.83	5,684.21	20.11	20.23	-21.28	69.48	235.19	152.04	111.97	40.07	3.794	Alert		
5,750.00	5,744.92	5,741.78	5,734.03	20.29	20.41	-21.90	70.63	238.58	150.44	110.02	40.43	3.721	Alert		
5,800.00	5,794.62	5,808.27	5,783.85	20.47	20.65	-22.53	71.77	241.96	148.86	108.02	40.84	3.645	Alert		
5,850.00	5,844.31	5,841.68	5,833.67	20.65	20.77	-23.18	72.91	245.35	147.30	106.16	41.14	3.581	Alert		
5,900.00	5,894.00	5,908.38	5,883.49	20.83	21.02	-23.84	74.06	248.73	145.76	104.20	41.56	3.507	Alert		
5,950.00	5,943.69	5,941.57	5,933.31	21.01	21.14	-24.52	75.20	252.12	144.24	102.38	41.85	3.446	Alert		
6,000.00	5,993.39	5,991.52	5,983.13	21.19	21.32	-25.21	76.34	255.50	142.74	100.52	42.21	3.381	Alert		
6,050.00	6,043.08	6,041.47	6,032.95	21.37	21.51	-25.91	77.48	258.89	141.25	98.68	42.57	3.318	Alert		
6,100.00	6,092.77	6,108.59	6,082.77	21.55	21.75	-26.63	78.63	262.28	139.80	96.80	42.99	3.252	Alert		
6,150.00	6,142.47	6,141.36	6,132.69	21.73	21.87	-27.36	79.77	265.66	138.36	95.07	43.29	3.196	Alert		
6,200.00	6,192.16	6,191.31	6,182.41	21.91	22.05	-28.11	80.91	269.05	136.94	93.29	43.65	3.137	Alert		
6,250.00	6,241.85	6,241.26	6,232.23	22.09	22.24	-28.88	82.06	272.43	135.56	91.54	44.01	3.080	Alert		
6,300.00	6,291.54	6,308.80	6,282.05	22.27	22.49	-29.66	83.20	275.82	134.19	89.75	44.44	3.020	Alert		
6,350.00	6,341.24	6,341.15	6,331.87	22.46	22.60	-30.45	84.34	279.20	132.85	88.12	44.74	2.970	Alert		
6,400.00	6,390.93	6,408.90	6,381.69	22.64	22.85	-31.27	85.49	282.59	131.54	86.38	45.16	2.913	Alert		
6,450.00	6,440.62	6,441.05	6,431.51	22.82	22.97	-32.10	86.63	285.97	130.25	84.79	45.46	2.865	Alert		
6,500.00	6,490.32	6,509.01	6,481.33	23.00	23.22	-32.94	87.77	289.36	128.99	83.10	45.89	2.811	Alert		
6,550.00	6,540.01	6,540.94	6,531.15	23.19	23.34	-33.80	88.91	292.75	127.76	81.57	46.19	2.766	Alert		
6,600.00	6,589.70	6,609.11	6,580.97	23.37	23.59	-34.68	90.06	296.13	126.56	79.94	46.62	2.715	Alert		
6,650.00	6,639.39	6,640.84	6,630.79	23.55	23.70	-35.57	91.20	299.52	125.39	78.47	46.92	2.672	Alert		
6,700.00	6,689.09	6,690.78	6,680.61	23.73	23.89	-36.49	92.34	302.90	124.25	76.97	47.29	2.628	Alert		
6,750.00	6,738.78	6,740.73	6,730.43	23.92	24.07	-37.41	93.49	306.29	123.15	75.49	47.66	2.584	Alert		
6,800.00	6,788.47	6,809.32	6,780.25	24.10	24.32	-38.36	94.63	309.67	122.07	73.98	48.09	2.538	Alert		
6,850.00	6,838.17	6,840.63	6,830.07	24.29	24.44	-39.32	95.77	313.06	121.03	72.64	48.39	2.501	Alert		
6,900.00	6,887.86	6,890.57	6,879.88	24.47	24.62	-40.30	96.91	316.44	120.03	71.27	48.76	2.462	Minor Risk		
6,950.00	6,937.55	6,940.52	6,929.70	24.65	24.80	-41.29	98.06	319.83	119.06	69.93	49.13	2.423	Minor Risk		
7,000.00	6,987.24	6,990.47	6,979.52	24.84	24.99	-42.30	99.20	323.21	118.12	68.62	49.50	2.386	Minor Risk		
7,050.00	7,036.94	7,040.42	7,029.34	25.02	25.17	-43.32	100.34	326.60	117.23	67.35	49.87	2.350	Minor Risk		
7,100.00	7,086.63	7,109.64	7,079.16	25.21	25.43	-44.36	101.49	329.99	116.37	66.05	50.32	2.313	Minor Risk		
7,150.00	7,136.32	7,140.31	7,128.98	25.39	25.54	-45.42	102.63	333.37	115.55	64.93	50.62	2.283	Minor Risk		
7,200.00	7,186.02	7,190.26	7,178.80	25.58	25.72	-46.49	103.77	336.76	114.77	63.78	50.99	2.251	Minor Risk		
7,250.00	7,235.71	7,240.21	7,228.62	25.76	25.91	-47.57	104.91	340.14	114.03	62.66	51.37	2.220	Minor Risk		
7,300.00	7,285.40	7,309.85	7,278.44	25.95	26.16	-48.67	106.06	343.53	113.34	61.52	51.82	2.187	Minor Risk		
7,350.00	7,335.09	7,340.10	7,328.26	26.13	26.27	-49.78	107.20	346.91	112.68	60.56	52.12	2.162	Minor Risk		
7,400.00	7,384.79	7,409.95	7,378.08	26.32	26.53	-50.91	108.34	350.30	112.07	59.50	52.57	2.132	Minor Risk		
7,450.00	7,434.48	7,440.00	7,427.90	26.50	26.64	-52.04	109.49	353.68	111.50	58.63	52.87	2.109	Minor Risk		
7,500.00	7,484.17	7,489.94	7,477.72	26.69	26.83	-53.19	110.63	357.07	110.98	57.72	53.25	2.084	Minor Risk		
7,550.00	7,533.86	7,539.89	7,527.54	26.87	27.01	-54.35	111.77	360.46	110.50	56.87	53.63	2.060	Minor Risk		
7,600.00	7,583.56	7,589.84	7,577.36	27.06	27.19	-55.51	112.92	363.84	110.06	56.05	54.01	2.038	Minor Risk		
7,650.00	7,633.25	7,639.79	7,627.18	27.25	27.38	-56.69	114.06	367.23	109.68	55.29	54.39	2.017	Minor Risk		
7,700.00	7,682.94	7,689.74	7,677.00	27.43	27.56	-57.87	115.20	370.61	109.34	54.57	54.77	1.996	Minor Risk		
7,750.00	7,732.64	7,739.68	7,726.82	27.62	27.74	-59.06	116.34	374.00	109.04	53.89	55.15	1.977	Minor Risk		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.50 ft
Reference														
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
7,800.00	7,782.33	7,789.63	7,776.64	27.81	27.93	-60.26	117.49	377.38	108.80	53.27	55.53	1.959	Minor Risk	
7,850.00	7,832.02	7,839.58	7,826.46	27.99	28.11	-61.46	118.63	380.77	108.60	52.69	55.91	1.942	Minor Risk	
7,900.00	7,881.71	7,889.53	7,876.28	28.18	28.30	-62.66	119.77	384.15	108.45	52.15	56.29	1.926	Minor Risk	
7,950.00	7,931.41	7,939.47	7,926.10	28.37	28.48	-63.87	120.92	387.54	108.34	51.67	56.67	1.912	Minor Risk	
8,000.00	7,981.10	7,989.42	7,975.92	28.55	28.66	-65.08	122.06	390.93	108.29	51.23	57.06	1.898	Minor Risk	
8,031.16	8,012.06	8,020.54	8,006.96	28.67	28.78	-65.83	122.77	393.04	108.28	50.99	57.29	1.890	Minor Risk	
8,050.00	8,030.79	8,039.37	8,025.74	28.74	28.85	-66.29	123.20	394.31	108.28	50.85	57.44	1.885	Minor Risk	
8,100.00	8,080.49	8,089.32	8,075.55	28.93	29.03	-67.50	124.34	397.70	108.33	50.51	57.82	1.874	Minor Risk	
8,150.00	8,130.18	8,139.26	8,125.37	29.11	29.22	-68.71	125.49	401.08	108.42	50.22	58.20	1.863	Minor Risk	
8,200.00	8,179.87	8,189.21	8,175.19	29.30	29.40	-69.91	126.63	404.47	108.55	49.97	58.58	1.853	Minor Risk	
8,250.00	8,229.56	8,239.16	8,225.01	29.49	29.58	-71.12	127.77	407.85	108.74	49.78	58.96	1.844	Minor Risk	
8,300.00	8,279.26	8,289.11	8,274.83	29.68	29.77	-72.31	128.92	411.24	108.98	49.63	59.34	1.836	Minor Risk	
8,350.00	8,328.95	8,339.05	8,324.65	29.86	29.95	-73.51	130.06	414.62	109.26	49.53	59.73	1.829	Minor Risk	
8,400.00	8,378.64	8,389.00	8,374.47	30.05	30.14	-74.69	131.20	418.01	109.59	49.48	60.11	1.823	Minor Risk	
8,450.00	8,428.34	8,438.95	8,424.29	30.24	30.32	-75.87	132.35	421.40	109.96	49.48	60.49	1.818	Minor Risk	
8,500.00	8,478.03	8,488.90	8,474.11	30.43	30.50	-77.04	133.49	424.78	110.39	49.52	60.87	1.814	Minor Risk	
8,550.00	8,527.72	8,538.84	8,523.93	30.62	30.69	-78.20	134.63	428.17	110.85	49.61	61.25	1.810	Minor Risk	
8,600.00	8,577.41	8,588.79	8,573.75	30.80	30.87	-79.35	135.77	431.55	111.37	49.74	61.63	1.807	Minor Risk	
8,650.00	8,627.11	8,638.74	8,623.57	30.99	31.06	-80.48	136.92	434.94	111.93	49.92	62.00	1.805	Minor Risk	
8,700.00	8,676.80	8,688.69	8,673.39	31.18	31.24	-81.61	138.06	438.32	112.53	50.14	62.38	1.804	Minor Risk	
8,750.00	8,726.49	8,738.63	8,723.21	31.37	31.42	-82.73	139.20	441.71	113.17	50.41	62.76	1.803	Minor Risk	
8,800.00	8,776.19	8,788.58	8,773.03	31.56	31.61	-83.83	140.35	445.09	113.86	50.72	63.14	1.803	Minor Risk	
8,850.00	8,825.88	8,838.53	8,822.85	31.74	31.79	-84.91	141.49	448.48	114.59	51.07	63.51	1.804	Minor Risk	
8,900.00	8,875.57	8,888.48	8,872.67	31.93	31.98	-85.99	142.63	451.87	115.36	51.47	63.89	1.806	Minor Risk	
8,950.00	8,925.26	8,938.42	8,922.49	32.12	32.16	-87.05	143.77	455.25	116.17	51.90	64.27	1.808	Minor Risk	
9,000.00	8,974.96	8,988.37	8,972.31	32.31	32.35	-88.09	144.92	458.64	117.01	52.37	64.64	1.810	Minor Risk	
9,050.00	9,024.65	9,038.32	9,022.13	32.50	32.53	-89.12	146.06	462.02	117.90	52.89	65.01	1.813	Minor Risk	
9,100.00	9,074.34	9,088.27	9,071.95	32.69	32.71	-90.13	147.20	465.41	118.83	53.44	65.39	1.817	Minor Risk	
9,150.00	9,124.04	9,138.21	9,121.77	32.88	32.90	-91.13	148.35	468.79	119.79	54.02	65.76	1.822	Minor Risk	
9,200.00	9,173.73	9,188.16	9,171.59	33.07	33.08	-92.11	149.49	472.18	120.78	54.65	66.13	1.826	Minor Risk	
9,250.00	9,223.42	9,238.11	9,221.41	33.25	33.27	-93.08	150.63	475.56	121.81	55.31	66.51	1.832	Minor Risk	
9,300.00	9,273.11	9,288.06	9,271.22	33.44	33.45	-94.02	151.78	478.95	122.88	56.00	66.88	1.837	Minor Risk	
9,350.00	9,322.81	9,338.00	9,321.04	33.63	33.64	-94.96	152.92	482.34	123.98	56.73	67.25	1.844	Minor Risk	
9,400.00	9,372.50	9,387.95	9,370.86	33.82	33.82	-95.87	154.06	485.72	125.11	57.49	67.62	1.850	Minor Risk	
9,450.00	9,422.19	9,437.90	9,420.68	34.01	34.00	-96.77	155.20	489.11	126.27	58.28	67.99	1.857	Minor Risk	
9,500.00	9,471.89	9,487.85	9,470.50	34.20	34.19	-97.65	156.35	492.49	127.47	59.11	68.36	1.865	Minor Risk	
9,550.00	9,521.58	9,537.80	9,520.32	34.39	34.37	-98.52	157.49	495.88	128.69	59.96	68.73	1.872	Minor Risk	
9,600.00	9,571.27	9,587.74	9,570.14	34.58	34.56	-99.37	158.63	499.26	129.94	60.84	69.09	1.881	Minor Risk	
9,650.00	9,620.96	9,637.69	9,619.96	34.77	34.74	-100.20	159.78	502.65	131.22	61.76	69.46	1.889	Minor Risk	
9,700.00	9,670.66	9,687.64	9,669.78	34.96	34.93	-101.02	160.92	506.03	132.53	62.70	69.83	1.898	Minor Risk	
9,750.00	9,720.35	9,737.59	9,719.60	35.15	35.11	-101.82	162.06	509.42	133.86	63.66	70.20	1.907	Minor Risk	
9,800.00	9,770.04	9,787.53	9,769.42	35.34	35.29	-102.60	163.20	512.81	135.22	64.65	70.56	1.916	Minor Risk	
9,850.00	9,819.74	9,837.48	9,819.24	35.53	35.48	-103.37	164.35	516.19	136.60	65.67	70.93	1.926	Minor Risk	
9,900.00	9,869.48	9,887.45	9,869.08	35.72	35.66	-103.94	165.49	519.58	137.88	66.59	71.30	1.934	Minor Risk	
9,950.00	9,919.29	9,937.43	9,918.93	35.90	35.85	-104.24	166.63	522.97	139.02	67.36	71.66	1.940	Minor Risk	
10,000.00	9,969.15	9,987.42	9,968.79	36.09	36.03	-104.28	167.78	526.35	140.00	67.97	72.03	1.944	Minor Risk	
10,050.00	10,019.05	10,037.41	10,018.66	36.27	36.22	-104.05	168.92	529.74	140.82	68.42	72.40	1.945	Minor Risk	
10,100.00	10,068.99	10,087.39	10,068.51	36.45	36.40	-103.57	170.07	533.13	141.49	68.72	72.77	1.944	Minor Risk	
10,150.00	10,118.96	10,137.35	10,118.34	36.63	36.59	-102.83	171.21	536.52	142.02	68.88	73.14	1.942	Minor Risk	
10,200.00	10,168.95	10,187.29	10,168.15	36.80	36.77	-101.84	172.35	539.90	142.44	68.93	73.51	1.938	Minor Risk	
10,250.00	10,218.94	10,237.19	10,217.93	36.98	36.95	-100.60	173.49	543.28	142.78	68.90	73.88	1.933	Minor Risk	
10,300.00	10,268.94	10,287.06	10,267.67	37.15	37.14	-12.65	174.63	546.66	143.11	68.87	74.24	1.928	Minor Risk	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design: Sec 27-T25S-R31E - Lusitano 27_34 Fed Com 713H - Wellbore #1 - Permit Plan 2														Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.50 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi-Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre N/S (ft)	Offset Wellbore Centre E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
10,350.00	10,318.94	10,336.93	10,317.41	37.32	37.32	-11.23		175.78	550.05	143.53	68.92	74.61	1.924	Minor Risk	
10,400.00	10,368.94	10,386.81	10,367.16	37.49	37.51	-9.82		176.92	553.43	144.04	69.07	74.97	1.921	Minor Risk	
10,450.00	10,418.94	10,436.68	10,416.90	37.67	37.69	-8.43		178.06	556.81	144.63	69.30	75.34	1.920	Minor Risk	
10,500.00	10,468.94	10,486.55	10,466.65	37.84	37.88	-7.04		179.20	560.19	145.31	69.61	75.70	1.920	Minor Risk	
10,550.00	10,518.94	10,536.42	10,516.39	38.01	38.06	-5.67		180.34	563.57	146.07	70.02	76.06	1.921	Minor Risk	
10,600.00	10,568.94	10,586.29	10,566.14	38.19	38.24	-4.32		181.48	566.95	146.92	70.51	76.41	1.923	Minor Risk	
10,650.00	10,618.91	10,636.36	10,616.08	38.35	38.43	176.98		182.60	570.27	149.15	72.38	76.77	1.943	Minor Risk	
10,700.00	10,668.59	10,686.41	10,666.04	38.52	38.61	178.11		183.54	573.05	155.52	78.41	77.11	2.017	Minor Risk	
10,750.00	10,717.59	10,735.83	10,715.41	38.67	38.79	178.96		184.26	575.18	166.05	88.61	77.44	2.144	Minor Risk	
10,800.00	10,765.54	10,784.29	10,763.84	38.83	38.96	179.53		184.77	576.69	180.64	102.87	77.77	2.323	Minor Risk	
10,850.00	10,812.08	10,831.44	10,810.99	38.97	39.13	179.84		185.08	577.60	199.17	121.09	78.08	2.551	Alert	
10,900.00	10,856.86	10,876.96	10,856.50	39.11	39.29	179.96		185.20	577.95	221.50	143.13	78.37	2.826	Alert	
10,950.00	10,899.53	10,919.78	10,899.33	39.24	39.44	179.96		185.20	577.96	247.54	168.90	78.65	3.148	Alert	
11,000.00	10,939.76	10,960.02	10,939.56	39.36	39.58	179.96		185.20	577.96	277.20	198.30	78.90	3.513	Alert	
11,050.00	10,977.26	11,002.48	10,977.06	39.48	39.72	179.96		185.20	577.96	310.25	231.10	79.15	3.920	Alert	
11,100.00	11,011.74	11,032.00	11,011.54	39.58	39.83	179.97		185.20	577.96	346.44	267.10	79.34	4.366	Alert	
11,150.00	11,042.93	11,063.19	11,042.73	39.68	39.93	179.97		185.20	577.96	385.50	305.97	79.52	4.847	Alert	
11,200.00	11,070.60	11,109.15	11,070.40	39.78	40.09	179.96		185.20	577.96	427.12	347.38	79.75	5.356		
11,250.00	11,094.53	11,114.79	11,094.33	39.88	40.11	179.96		185.20	577.96	471.00	391.19	79.82	5.901		
11,300.00	11,114.55	11,134.81	11,114.35	39.98	40.18	179.96		185.20	577.96	516.81	436.88	79.93	6.466		
11,350.00	11,130.50	11,150.76	11,130.30	40.10	40.24	179.95		185.20	577.96	564.18	484.16	80.01	7.051		
11,400.00	11,142.26	11,162.52	11,142.06	40.22	40.28	179.93		185.20	577.96	612.76	532.68	80.07	7.653		
11,450.00	11,149.74	12,224.72	11,788.00	40.35	42.72	179.97		-476.98	577.36	638.45	590.26	48.19	13.249		
11,500.00	11,152.89	12,274.60	11,788.00	40.48	42.86	179.97		-526.86	577.32	635.31	586.97	48.33	13.144		
11,546.67	11,153.37	12,321.27	11,788.00	40.62	43.00	179.97		-573.53	577.28	634.83	586.35	48.47	13.096		
11,550.00	11,153.00	12,324.60	11,788.00	40.63	43.01	179.97		-576.86	577.27	635.20	586.71	48.49	13.101		
11,600.00	11,153.00	12,374.60	11,788.00	40.78	43.17	179.97		-626.86	577.23	635.20	586.55	48.65	13.058		
11,650.00	11,153.00	12,424.60	11,788.00	40.95	43.34	179.97		-676.86	577.18	635.20	586.38	48.82	13.010		
11,700.00	11,153.00	12,474.60	11,788.00	41.12	43.52	179.97		-726.86	577.14	635.20	586.19	49.01	12.962		
11,750.00	11,153.00	12,524.60	11,788.00	41.32	43.72	179.97		-776.86	577.09	635.20	585.99	49.21	12.909		
11,800.00	11,153.00	12,574.60	11,788.00	41.52	43.92	179.96		-826.86	577.05	635.20	585.79	49.41	12.855		
11,850.00	11,153.00	12,624.60	11,788.00	41.73	44.14	179.96		-876.86	577.00	635.20	585.56	49.64	12.797		
11,900.00	11,153.00	12,674.60	11,788.00	41.95	44.36	179.96		-926.86	576.96	635.20	585.33	49.87	12.738		
11,950.00	11,153.00	12,724.60	11,788.00	42.19	44.60	179.96		-976.86	576.91	635.20	585.09	50.12	12.675		
12,000.00	11,153.00	12,774.60	11,788.00	42.44	44.84	179.96		-1,026.86	576.87	635.20	584.83	50.37	12.611		
12,050.00	11,153.00	12,824.60	11,788.00	42.70	45.10	179.96		-1,076.86	576.82	635.20	584.56	50.64	12.544		
12,100.00	11,153.00	12,874.60	11,788.00	42.96	45.36	179.96		-1,126.86	576.78	635.20	584.29	50.91	12.477		
12,150.00	11,153.00	12,924.60	11,788.00	43.24	45.64	179.96		-1,176.86	576.73	635.20	584.00	51.20	12.406		
12,200.00	11,153.00	12,974.60	11,788.00	43.53	45.92	179.96		-1,226.86	576.69	635.20	583.70	51.50	12.335		
12,250.00	11,153.00	13,024.60	11,788.00	43.83	46.22	179.95		-1,276.86	576.64	635.20	583.39	51.81	12.261		
12,300.00	11,153.00	13,074.60	11,788.00	44.14	46.52	179.95		-1,326.86	576.60	635.20	583.08	52.12	12.187		
12,350.00	11,153.00	13,124.60	11,788.00	44.46	46.84	179.95		-1,376.86	576.55	635.20	582.75	52.45	12.110		
12,400.00	11,153.00	13,174.60	11,788.00	44.78	47.16	179.95		-1,426.86	576.51	635.20	582.41	52.79	12.033		
12,450.00	11,153.00	13,224.60	11,788.00	45.12	47.49	179.95		-1,476.86	576.46	635.20	582.06	53.14	11.954		
12,500.00	11,153.00	13,274.60	11,788.00	45.46	47.83	179.95		-1,526.86	576.42	635.20	581.71	53.49	11.875		
12,550.00	11,153.00	13,324.60	11,788.00	45.82	48.18	179.95		-1,576.86	576.37	635.20	581.34	53.86	11.794		
12,600.00	11,153.00	13,374.60	11,788.00	46.18	48.53	179.95		-1,626.86	576.33	635.20	580.97	54.23	11.713		
12,650.00	11,153.00	13,424.60	11,788.00	46.56	48.90	179.94		-1,676.86	576.28	635.20	580.59	54.61	11.631		
12,700.00	11,153.00	13,474.60	11,788.00	46.93	49.27	179.94		-1,726.86	576.24	635.20	580.20	55.00	11.548		
12,750.00	11,153.00	13,524.60	11,788.00	47.33	49.65	179.94		-1,776.86	576.19	635.20	579.79	55.41	11.464		
12,800.00	11,153.00	13,574.60	11,788.00	47.72	50.04	179.94		-1,826.86	576.15	635.20	579.39	55.81	11.381		
12,850.00	11,153.00	13,624.60	11,788.00	48.13	50.43	179.94		-1,876.86	576.10	635.20	578.97	56.23	11.296		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.50 ft
Reference	Offset	Semi Major Axis		Distance		Minimum		Separation		Warning				
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre Ni-S (ft)	+EJ-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
12,900.00	11,153.00	13,674.60	11,788.00	48.53	50.84	179.94	-1,926.86	576.06	635.20	578.55	56.65	11.212		
12,950.00	11,153.00	13,724.60	11,788.00	48.96	51.24	179.94	-1,976.86	576.01	635.20	578.11	57.09	11.127		
13,000.00	11,153.00	13,774.60	11,788.00	49.38	51.66	179.94	-2,026.86	575.96	635.20	577.68	57.52	11.043		
13,050.00	11,153.00	13,824.60	11,788.00	49.81	52.08	179.94	-2,076.86	575.92	635.20	577.23	57.97	10.957		
13,100.00	11,153.00	13,874.60	11,788.00	50.25	52.51	179.93	-2,126.86	575.87	635.20	576.78	58.42	10.872		
13,150.00	11,153.00	13,924.60	11,788.00	50.70	52.95	179.93	-2,176.86	575.83	635.20	576.32	58.88	10.787		
13,200.00	11,153.00	13,974.60	11,788.00	51.15	53.39	179.93	-2,226.86	575.78	635.20	575.85	59.35	10.703		
13,250.00	11,153.00	14,024.60	11,788.00	51.61	53.84	179.93	-2,276.86	575.74	635.20	575.37	59.83	10.617		
13,300.00	11,153.00	14,074.60	11,788.00	52.07	54.30	179.93	-2,326.86	575.69	635.20	574.90	60.31	10.533		
13,350.00	11,153.00	14,124.60	11,788.00	52.54	54.76	179.93	-2,376.86	575.65	635.20	574.41	60.79	10.448		
13,400.00	11,153.00	14,174.60	11,788.00	53.02	55.22	179.93	-2,426.86	575.60	635.20	573.92	61.28	10.365		
13,450.00	11,153.00	14,224.60	11,788.00	53.50	55.69	179.93	-2,476.86	575.56	635.20	573.41	61.79	10.281		
13,500.00	11,153.00	14,274.60	11,788.00	53.98	56.17	179.93	-2,526.86	575.51	635.20	572.91	62.29	10.198		
13,550.00	11,153.00	14,324.60	11,788.00	54.48	56.65	179.92	-2,576.86	575.47	635.20	572.40	62.80	10.114		
13,600.00	11,153.00	14,374.60	11,788.00	54.98	57.14	179.92	-2,626.86	575.42	635.20	571.88	63.32	10.032		
13,650.00	11,153.00	14,424.60	11,788.00	55.48	57.63	179.92	-2,676.86	575.38	635.20	571.36	63.84	9.950		
13,700.00	11,153.00	14,474.60	11,788.00	55.99	58.13	179.92	-2,726.86	575.33	635.20	570.84	64.37	9.869		
13,750.00	11,153.00	14,524.60	11,788.00	56.50	58.63	179.92	-2,776.86	575.29	635.20	570.30	64.90	9.788		
13,800.00	11,153.00	14,574.60	11,788.00	57.01	59.14	179.92	-2,826.86	575.24	635.20	569.77	65.44	9.707		
13,850.00	11,153.00	14,624.60	11,788.00	57.54	59.65	179.92	-2,876.86	575.20	635.20	569.22	65.98	9.627		
13,900.00	11,153.00	14,674.60	11,788.00	58.06	60.17	179.92	-2,926.86	575.15	635.20	568.68	66.52	9.548		
13,950.00	11,153.00	14,724.60	11,788.00	58.59	60.69	179.91	-2,976.86	575.11	635.20	568.12	67.08	9.470		
14,000.00	11,153.00	14,774.60	11,788.00	59.13	61.21	179.91	-3,026.86	575.06	635.20	567.57	67.63	9.392		
14,050.00	11,153.00	14,824.60	11,788.00	59.67	61.74	179.91	-3,076.86	575.02	635.20	567.01	68.20	9.314		
14,100.00	11,153.00	14,874.60	11,788.00	60.21	62.27	179.91	-3,126.86	574.97	635.20	566.44	68.76	9.238		
14,150.00	11,153.00	14,924.60	11,788.00	60.75	62.81	179.91	-3,176.86	574.93	635.20	565.87	69.33	9.162		
14,200.00	11,153.00	14,974.60	11,788.00	61.30	63.35	179.91	-3,226.86	574.88	635.20	565.30	69.90	9.087		
14,250.00	11,153.00	15,024.60	11,788.00	61.86	63.89	179.91	-3,276.86	574.84	635.20	564.72	70.48	9.012		
14,300.00	11,153.00	15,074.60	11,788.00	62.41	64.44	179.91	-3,326.86	574.79	635.20	564.14	71.06	8.938		
14,350.00	11,153.00	15,124.60	11,788.00	62.98	64.99	179.91	-3,376.86	574.75	635.20	563.55	71.65	8.865		
14,400.00	11,153.00	15,174.60	11,788.00	63.54	65.54	179.90	-3,426.86	574.70	635.20	562.96	72.24	8.793		
14,450.00	11,153.00	15,224.60	11,788.00	64.11	66.10	179.90	-3,476.86	574.66	635.20	562.37	72.83	8.721		
14,500.00	11,153.00	15,274.60	11,788.00	64.67	66.66	179.90	-3,526.86	574.61	635.20	561.77	73.43	8.651		
14,550.00	11,153.00	15,324.60	11,788.00	65.25	67.22	179.90	-3,576.86	574.57	635.20	561.17	74.03	8.580		
14,600.00	11,153.00	15,374.60	11,788.00	65.82	67.79	179.90	-3,626.86	574.52	635.20	560.57	74.63	8.511		
14,650.00	11,153.00	15,424.60	11,788.00	66.41	68.36	179.90	-3,676.86	574.48	635.20	559.96	75.24	8.442		
14,700.00	11,153.00	15,474.60	11,788.00	66.99	68.93	179.90	-3,726.86	574.43	635.20	559.35	75.85	8.374		
14,750.00	11,153.00	15,524.60	11,788.00	67.57	69.51	179.90	-3,776.86	574.39	635.20	558.74	76.47	8.307		
14,800.00	11,153.00	15,574.60	11,788.00	68.16	70.09	179.90	-3,826.86	574.34	635.20	558.12	77.08	8.241		
14,850.00	11,153.00	15,624.60	11,788.00	68.75	70.67	179.89	-3,876.86	574.30	635.20	557.50	77.70	8.175		
14,900.00	11,153.00	15,674.60	11,788.00	69.34	71.25	179.89	-3,926.86	574.25	635.20	556.88	78.32	8.110		
14,950.00	11,153.00	15,724.60	11,788.00	69.94	71.84	179.89	-3,976.86	574.21	635.20	556.25	78.95	8.046		
15,000.00	11,153.00	15,774.60	11,788.00	70.53	72.43	179.89	-4,026.86	574.16	635.20	555.62	79.58	7.982		
15,050.00	11,153.00	15,824.60	11,788.00	71.14	73.02	179.89	-4,076.86	574.12	635.20	554.99	80.21	7.919		
15,100.00	11,153.00	15,874.60	11,788.00	71.74	73.61	179.89	-4,126.86	574.07	635.20	554.36	80.84	7.857		
15,150.00	11,153.00	15,924.60	11,788.00	72.34	74.21	179.89	-4,176.86	574.03	635.20	553.72	81.48	7.796		
15,200.00	11,153.00	15,974.60	11,788.00	72.95	74.81	179.89	-4,226.86	573.98	635.20	553.08	82.12	7.735		
15,250.00	11,153.00	16,024.60	11,788.00	73.56	75.41	179.88	-4,276.86	573.94	635.20	552.44	82.76	7.675		
15,300.00	11,153.00	16,074.60	11,788.00	74.17	76.01	179.88	-4,326.86	573.89	635.20	551.80	83.40	7.616		
15,350.00	11,153.00	16,124.60	11,788.00	74.78	76.62	179.88	-4,376.86	573.85	635.20	551.15	84.05	7.557		
15,400.00	11,153.00	16,174.60	11,788.00	75.40	77.22	179.88	-4,426.86	573.80	635.20	550.50	84.70	7.499		
15,450.00	11,153.00	16,224.60	11,788.00	76.02	77.83	179.88	-4,476.86	573.76	635.20	549.85	85.35	7.442		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design													Offset Site Error:
Sec 27-T25S-R31E - Lusitano 27 34 Fed Com 713H - Wellbore #1 - Permit Plan 2													0.00 ft
Survey Program: 0-MWD+HDGM													Offset Well Error:
Reference													0.50 ft
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	N-S	(ft)	(ft)	(ft)	(ft)		
15,500.00	11,153.00	16,274.60	11,788.00	76.63	78.44	179.88	-4,526.86	573.71	635.20	549.20	86.00	7.386	
15,550.00	11,153.00	16,324.60	11,788.00	77.26	79.06	179.88	-4,576.86	573.67	635.20	548.54	86.66	7.330	
15,600.00	11,153.00	16,374.60	11,788.00	77.88	79.67	179.88	-4,626.86	573.62	635.20	547.88	87.32	7.275	
15,650.00	11,153.00	16,424.60	11,788.00	78.50	80.29	179.88	-4,676.86	573.57	635.20	547.22	87.98	7.220	
15,700.00	11,153.00	16,474.60	11,788.00	79.13	80.91	179.87	-4,726.86	573.53	635.20	546.56	88.64	7.166	
15,750.00	11,153.00	16,524.60	11,788.00	79.76	81.53	179.87	-4,776.86	573.48	635.20	545.90	89.30	7.113	
15,800.00	11,153.00	16,574.60	11,788.00	80.39	82.15	179.87	-4,826.86	573.44	635.20	545.23	89.97	7.060	
15,850.00	11,153.00	16,624.60	11,788.00	81.02	82.77	179.87	-4,876.86	573.39	635.20	544.57	90.64	7.008	
15,900.00	11,153.00	16,674.60	11,788.00	81.65	83.40	179.87	-4,926.86	573.35	635.20	543.90	91.31	6.957	
15,950.00	11,153.00	16,724.60	11,788.00	82.29	84.03	179.87	-4,976.86	573.30	635.20	543.22	91.98	6.906	
16,000.00	11,153.00	16,774.60	11,788.00	82.92	84.66	179.87	-5,026.86	573.26	635.20	542.55	92.65	6.856	
16,050.00	11,153.00	16,824.60	11,788.00	83.56	85.29	179.87	-5,076.86	573.21	635.20	541.88	93.33	6.806	
16,100.00	11,153.00	16,874.60	11,788.00	84.20	85.92	179.87	-5,126.86	573.17	635.20	541.20	94.00	6.757	
16,150.00	11,153.00	16,924.60	11,788.00	84.84	86.55	179.86	-5,176.86	573.12	635.20	540.52	94.68	6.709	
16,200.00	11,153.00	16,974.60	11,788.00	85.48	87.18	179.86	-5,226.86	573.08	635.20	539.84	95.36	6.661	
16,250.00	11,153.00	17,024.60	11,788.00	86.12	87.82	179.86	-5,276.86	573.03	635.20	539.16	96.04	6.614	
16,300.00	11,153.00	17,074.60	11,788.00	86.77	88.46	179.86	-5,326.86	572.99	635.20	538.48	96.72	6.567	
16,350.00	11,153.00	17,124.60	11,788.00	87.41	89.10	179.86	-5,376.86	572.94	635.20	537.79	97.41	6.521	
16,400.00	11,153.00	17,174.60	11,788.00	88.06	89.74	179.86	-5,426.86	572.90	635.20	537.11	98.09	6.475	
16,450.00	11,153.00	17,224.60	11,788.00	88.71	90.38	179.86	-5,476.86	572.85	635.20	536.42	98.78	6.430	
16,500.00	11,153.00	17,274.60	11,788.00	89.36	91.02	179.86	-5,526.86	572.81	635.20	535.73	99.47	6.386	
16,550.00	11,153.00	17,324.60	11,788.00	90.01	91.67	179.85	-5,576.86	572.76	635.20	535.04	100.16	6.342	
16,600.00	11,153.00	17,374.60	11,788.00	90.66	92.31	179.85	-5,626.86	572.72	635.20	534.35	100.85	6.298	
16,650.00	11,153.00	17,424.60	11,788.00	91.31	92.96	179.85	-5,676.86	572.67	635.20	533.66	101.55	6.255	
16,700.00	11,153.00	17,474.60	11,788.00	91.96	93.60	179.85	-5,726.86	572.63	635.20	532.96	102.24	6.213	
16,750.00	11,153.00	17,524.60	11,788.00	92.62	94.25	179.85	-5,776.86	572.58	635.20	532.27	102.94	6.171	
16,800.00	11,153.00	17,574.60	11,788.00	93.28	94.90	179.85	-5,826.86	572.54	635.20	531.57	103.63	6.129	
16,850.00	11,153.00	17,624.60	11,788.00	93.93	95.55	179.85	-5,876.86	572.49	635.20	530.87	104.33	6.088	
16,900.00	11,153.00	17,674.60	11,788.00	94.59	96.21	179.85	-5,926.86	572.45	635.20	530.17	105.03	6.048	
16,950.00	11,153.00	17,724.60	11,788.00	95.25	96.86	179.85	-5,976.86	572.40	635.20	529.47	105.73	6.008	
17,000.00	11,153.00	17,774.60	11,788.00	95.91	97.51	179.84	-6,026.86	572.36	635.20	528.77	106.43	5.968	
17,000.39	11,153.00	17,774.99	11,788.00	95.91	97.52	179.84	-6,027.25	572.36	635.20	528.76	106.44	5.968	
17,050.00	11,153.00	17,792.41	11,788.00	96.57	97.75	179.84	-6,044.66	572.34	636.02	529.57	106.44	5.975	
17,100.00	11,153.00	17,792.41	11,788.00	97.23	97.75	179.84	-6,044.66	572.34	640.50	534.61	105.89	6.049	
17,150.00	11,153.00	17,792.41	11,788.00	97.89	97.75	179.84	-6,044.66	572.34	648.81	543.68	105.13	6.172	
17,200.00	11,153.00	17,792.41	11,788.00	98.56	97.75	179.84	-6,044.66	572.34	660.82	556.61	104.21	6.341	
17,250.00	11,153.00	17,792.41	11,788.00	99.22	97.75	179.84	-6,044.66	572.34	676.31	573.14	103.17	6.555	
17,300.00	11,153.00	17,792.41	11,788.00	99.89	97.75	179.84	-6,044.66	572.34	695.07	593.01	102.06	6.811	
17,327.72	11,153.00	17,792.41	11,788.00	100.26	97.75	179.84	-6,044.66	572.34	706.78	605.35	101.42	6.969	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre N/S (ft)	Offset Wellbore Centre E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
9,450.00	9,422.19	9,528.11	9,515.44	34.01	34.06	-1.69	164.86	2,001.45	1,498.41	1,431.43	66.97	22.373			
9,500.00	9,471.89	9,577.34	9,564.56	34.20	34.24	-1.76	166.24	1,998.35	1,489.89	1,422.56	67.33	22.128			
9,550.00	9,521.58	9,626.58	9,613.68	34.39	34.42	-1.83	167.62	1,995.25	1,481.38	1,413.69	67.69	21.886			
9,600.00	9,571.27	9,675.81	9,662.80	34.58	34.60	-1.91	169.00	1,992.14	1,472.86	1,404.82	68.04	21.646			
9,650.00	9,620.96	9,725.05	9,711.92	34.77	34.79	-1.98	170.38	1,989.04	1,464.35	1,395.95	68.40	21.409			
9,700.00	9,670.66	9,774.29	9,761.04	34.96	34.97	-2.05	171.76	1,985.94	1,455.85	1,387.09	68.76	21.174			
9,750.00	9,720.35	9,823.52	9,810.15	35.15	35.15	-2.13	173.14	1,982.83	1,447.34	1,378.23	69.11	20.941			
9,800.00	9,770.04	9,872.76	9,859.27	35.34	35.33	-2.20	174.52	1,979.73	1,438.84	1,369.37	69.47	20.711			
9,850.00	9,819.74	9,922.00	9,908.39	35.53	35.51	-2.28	175.90	1,976.63	1,430.36	1,360.53	69.83	20.484			
9,900.00	9,869.48	9,971.31	9,957.58	35.72	35.69	-2.35	177.28	1,973.52	1,422.35	1,352.16	70.19	20.265			
9,950.00	9,919.29	10,020.73	10,006.89	35.90	35.87	-2.42	178.67	1,970.41	1,414.98	1,344.44	70.54	20.058			
10,000.00	9,969.15	10,070.24	10,056.29	36.09	36.05	-2.50	180.05	1,967.28	1,408.27	1,337.37	70.90	19.862			
10,050.00	10,019.05	10,119.84	10,105.77	36.27	36.23	-2.57	181.44	1,964.16	1,402.20	1,330.95	71.26	19.678			
10,100.00	10,068.99	10,169.51	10,155.32	36.45	36.41	-2.64	182.84	1,961.03	1,396.79	1,325.18	71.62	19.504			
10,150.00	10,118.96	10,219.25	10,204.94	36.63	36.60	-2.71	184.23	1,957.89	1,392.03	1,320.06	71.97	19.341			
10,200.00	10,168.95	10,269.05	10,254.62	36.80	36.78	-2.78	185.63	1,954.76	1,387.93	1,315.60	72.33	19.189			
10,250.00	10,218.94	10,318.90	10,304.35	36.98	36.96	-2.85	187.02	1,951.61	1,384.48	1,311.79	72.69	19.047			
10,300.00	10,268.94	10,368.78	10,354.11	37.15	37.15	83.61	188.42	1,948.47	1,381.48	1,308.44	73.04	18.913			
10,350.00	10,318.94	10,418.66	10,403.88	37.32	37.33	83.54	189.82	1,945.33	1,378.51	1,305.11	73.40	18.781			
10,400.00	10,368.94	10,468.54	10,453.64	37.49	37.51	83.47	191.22	1,942.18	1,375.53	1,301.78	73.75	18.650			
10,450.00	10,418.94	10,518.42	10,503.40	37.67	37.69	83.39	192.62	1,939.04	1,372.56	1,298.45	74.11	18.521			
10,500.00	10,468.94	10,568.30	10,553.16	37.84	37.88	83.32	194.01	1,935.89	1,369.59	1,295.12	74.47	18.392			
10,550.00	10,518.94	10,618.19	10,602.92	38.01	38.06	83.25	195.41	1,932.75	1,366.62	1,291.80	74.82	18.265			
10,600.00	10,568.94	10,668.38	10,643.03	38.19	38.21	83.19	196.49	1,930.34	1,363.80	1,288.64	75.17	18.144			
10,650.00	10,618.91	10,696.55	10,681.14	38.35	38.35	-97.10	197.35	1,928.39	1,361.57	1,286.07	75.50	18.034			
10,700.00	10,668.59	10,734.48	10,719.03	38.52	38.48	-97.44	198.06	1,926.81	1,360.30	1,284.48	75.82	17.940			
10,735.62	10,703.59	10,761.22	10,745.75	38.63	38.58	-97.69	198.46	1,925.89	1,360.03	1,283.98	76.05	17.883 CC			
10,750.00	10,717.59	10,771.92	10,756.45	38.67	38.62	-97.80	198.60	1,925.58	1,360.08	1,283.94	76.14	17.862 ES			
10,800.00	10,765.54	10,808.61	10,793.13	38.83	38.75	-98.16	198.99	1,924.70	1,360.96	1,284.51	76.45	17.801			
10,850.00	10,812.08	10,844.30	10,828.81	38.97	38.88	-98.51	199.24	1,924.15	1,363.05	1,286.29	76.76	17.758			
10,900.00	10,856.86	10,878.74	10,863.25	39.11	39.00	-98.82	199.34	1,923.91	1,366.43	1,289.38	77.05	17.734			
10,950.00	10,899.53	10,917.92	10,902.43	39.24	39.14	-99.20	199.35	1,923.89	1,371.16	1,293.80	77.36	17.725			
11,000.00	10,939.76	10,958.15	10,942.66	39.36	39.28	-99.59	199.35	1,923.89	1,377.15	1,299.48	77.67	17.731			
11,050.00	10,977.26	11,004.35	10,980.16	39.48	39.44	-99.88	199.35	1,923.89	1,384.54	1,306.53	78.00	17.750			
11,100.00	11,011.74	11,030.13	11,014.64	39.58	39.53	-100.01	199.35	1,923.89	1,393.48	1,315.22	78.27	17.804			
11,150.00	11,042.93	11,061.32	11,045.83	39.68	39.64	-99.95	199.35	1,923.89	1,404.12	1,325.56	78.56	17.874			
11,200.00	11,070.60	11,088.99	11,073.50	39.78	39.73	-99.63	199.35	1,923.89	1,416.56	1,337.72	78.84	17.968			
11,250.00	11,094.53	11,112.92	11,097.43	39.88	39.82	-99.03	199.35	1,923.89	1,430.86	1,351.75	79.11	18.088			
11,300.00	11,114.55	11,132.94	11,117.45	39.98	39.89	-98.10	199.35	1,923.89	1,447.06	1,367.69	79.37	18.233			
11,350.00	11,130.50	11,148.89	11,133.40	40.10	39.94	-96.81	199.35	1,923.89	1,465.13	1,385.52	79.61	18.404			
11,400.00	11,142.26	11,160.65	11,145.16	40.22	39.99	-95.14	199.35	1,923.89	1,485.01	1,405.17	79.84	18.600			
11,450.00	11,149.74	12,240.30	11,798.00	40.35	42.48	-115.47	-473.38	1,925.69	1,494.54	1,417.66	76.88	19.440			
11,500.00	11,152.89	12,309.81	11,798.00	40.48	42.68	-115.47	-523.26	1,925.82	1,493.34	1,416.11	77.22	19.338			
11,532.01	11,153.31	12,322.19	11,798.00	40.57	42.72	-115.45	-555.27	1,925.91	1,493.25	1,415.91	77.34	19.307			
11,550.00	11,153.00	12,340.19	11,798.00	40.63	42.77	-115.46	-573.26	1,925.96	1,493.44	1,416.00	77.44	19.286			
11,600.00	11,153.00	12,409.81	11,798.00	40.78	43.00	-115.46	-623.26	1,926.09	1,493.59	1,415.81	77.78	19.204			
11,650.00	11,153.00	12,440.19	11,798.00	40.95	43.11	-115.46	-673.26	1,926.23	1,493.74	1,415.71	78.03	19.144			
11,700.00	11,153.00	12,509.82	11,798.00	41.12	43.36	-115.46	-723.26	1,926.36	1,493.89	1,415.47	78.42	19.050			
11,750.00	11,153.00	12,540.18	11,798.00	41.32	43.49	-115.45	-773.26	1,926.49	1,494.04	1,415.33	78.71	18.983			
11,800.00	11,153.00	12,609.82	11,798.00	41.52	43.77	-115.45	-823.26	1,926.63	1,494.19	1,415.04	79.15	18.878			
11,850.00	11,153.00	12,640.18	11,798.00	41.73	43.91	-115.45	-873.26	1,926.76	1,494.34	1,414.87	79.47	18.804			
11,900.00	11,153.00	12,709.82	11,798.00	41.95	44.23	-115.45	-923.26	1,926.89	1,494.49	1,414.52	79.96	18.689			

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 ft
Survey Program: 0-MWD-HDGM														Offset Well Error:	0.50 ft
Reference															
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface	Offset Wellbore Centre	Distance	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
				(ft)	(ft)	(ft)	(°)	+N/S (ft)	+E/W (ft)	(ft)	(ft)	(ft)			
11,950.00	11,153.00	12,740.18	11,798.00	42.19	44.37	-115.44		-973.26	1,927.03	1,494.64	1,414.32	80.32	18.609		
12,000.00	11,153.00	12,809.82	11,798.00	42.44	44.72	-115.44		-1,023.26	1,927.16	1,494.79	1,413.92	80.86	18.485		
12,050.00	11,153.00	12,840.18	11,798.00	42.70	44.88	-115.44		-1,073.26	1,927.29	1,494.94	1,413.69	81.25	18.399		
12,100.00	11,153.00	12,909.82	11,798.00	42.96	45.25	-115.43		-1,123.26	1,927.43	1,495.09	1,413.25	81.84	18.268		
12,150.00	11,153.00	12,940.18	11,798.00	43.24	45.43	-115.43		-1,173.25	1,927.56	1,495.24	1,412.98	82.26	18.177		
12,200.00	11,153.00	13,009.82	11,798.00	43.53	45.83	-115.43		-1,223.25	1,927.69	1,495.39	1,412.49	82.90	18.039		
12,250.00	11,153.00	13,040.18	11,798.00	43.83	46.01	-115.43		-1,273.25	1,927.83	1,495.54	1,412.19	83.35	17.943		
12,300.00	11,153.00	13,109.82	11,798.00	44.14	46.44	-115.42		-1,323.25	1,927.96	1,495.69	1,411.66	84.03	17.800		
12,350.00	11,153.00	13,140.18	11,798.00	44.46	46.64	-115.42		-1,373.25	1,928.10	1,495.84	1,411.33	84.51	17.701		
12,400.00	11,153.00	13,209.82	11,798.00	44.78	47.09	-115.42		-1,423.25	1,928.23	1,495.99	1,410.76	85.23	17.552		
12,450.00	11,153.00	13,240.18	11,798.00	45.12	47.30	-115.42		-1,473.25	1,928.36	1,496.14	1,410.40	85.74	17.450		
12,500.00	11,153.00	13,309.82	11,798.00	45.46	47.77	-115.41		-1,523.25	1,928.50	1,496.29	1,409.78	86.50	17.298		
12,550.00	11,153.00	13,340.18	11,798.00	45.82	47.99	-115.41		-1,573.25	1,928.63	1,496.44	1,409.40	87.03	17.194		
12,600.00	11,153.00	13,409.82	11,798.00	46.18	48.49	-115.41		-1,623.25	1,928.76	1,496.59	1,408.75	87.84	17.038		
12,650.00	11,153.00	13,440.18	11,798.00	46.56	48.72	-115.40		-1,673.25	1,928.90	1,496.74	1,408.34	88.40	16.932		
12,700.00	11,153.00	13,509.82	11,798.00	46.93	49.24	-115.40		-1,723.25	1,929.03	1,496.89	1,407.65	89.24	16.775		
12,750.00	11,153.00	13,540.18	11,798.00	47.33	49.47	-115.40		-1,773.25	1,929.16	1,497.03	1,407.22	89.82	16.667		
12,800.00	11,153.00	13,590.18	11,798.00	47.72	49.86	-115.40		-1,823.25	1,929.30	1,497.18	1,406.64	90.55	16.535		
12,850.00	11,153.00	13,640.18	11,798.00	48.13	50.26	-115.39		-1,873.25	1,929.43	1,497.33	1,406.03	91.30	16.400		
12,900.00	11,153.00	13,709.82	11,798.00	48.53	50.83	-115.39		-1,923.25	1,929.56	1,497.48	1,405.28	92.21	16.240		
12,950.00	11,153.00	13,740.18	11,798.00	48.96	51.08	-115.39		-1,973.25	1,929.70	1,497.63	1,404.80	92.84	16.132		
13,000.00	11,153.00	13,809.82	11,798.00	49.38	51.67	-115.39		-2,023.25	1,929.83	1,497.78	1,404.01	93.78	15.972		
13,050.00	11,153.00	13,840.18	11,798.00	49.81	51.93	-115.38		-2,073.25	1,929.96	1,497.93	1,403.51	94.43	15.863		
13,100.00	11,153.00	13,909.82	11,798.00	50.25	52.53	-115.38		-2,123.25	1,930.10	1,498.08	1,402.68	95.40	15.703		
13,150.00	11,153.00	13,940.18	11,798.00	50.70	52.80	-115.38		-2,173.25	1,930.23	1,498.23	1,402.17	96.07	15.595		
13,200.00	11,153.00	14,009.82	11,798.00	51.15	53.42	-115.37		-2,223.25	1,930.37	1,498.38	1,401.32	97.07	15.436		
13,250.00	11,153.00	14,040.18	11,798.00	51.61	53.70	-115.37		-2,273.24	1,930.50	1,498.53	1,400.78	97.76	15.329		
13,300.00	11,153.00	14,109.82	11,798.00	52.07	54.34	-115.37		-2,323.24	1,930.63	1,498.68	1,399.90	98.78	15.171		
13,350.00	11,153.00	14,140.18	11,798.00	52.54	54.62	-115.37		-2,373.24	1,930.77	1,498.83	1,399.34	99.49	15.065		
13,400.00	11,153.00	14,209.82	11,798.00	53.02	55.27	-115.36		-2,423.24	1,930.90	1,498.98	1,398.44	100.54	14.909		
13,450.00	11,153.00	14,240.18	11,798.00	53.50	55.57	-115.36		-2,473.24	1,931.03	1,499.13	1,397.86	101.27	14.804		
13,500.00	11,153.00	14,309.83	11,798.00	53.98	56.23	-115.36		-2,523.24	1,931.17	1,499.28	1,396.94	102.35	14.649		
13,550.00	11,153.00	14,340.18	11,798.00	54.48	56.53	-115.36		-2,573.24	1,931.30	1,499.43	1,396.35	103.09	14.545		
13,600.00	11,153.00	14,409.83	11,798.00	54.98	57.21	-115.35		-2,623.24	1,931.43	1,499.58	1,395.39	104.19	14.393		
13,650.00	11,153.00	14,440.17	11,798.00	55.48	57.52	-115.35		-2,673.24	1,931.57	1,499.73	1,394.79	104.94	14.291		
13,700.00	11,153.00	14,509.83	11,798.00	55.99	58.21	-115.35		-2,723.24	1,931.70	1,499.88	1,393.82	106.07	14.141 SF		

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGMI														Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre - N/S (ft)	Offset Wellbore Centre - E/W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
9,150.00	9,124.04	9,219.00	9,209.78	32.88	32.84	2.91	44.51	1,975.56	1,499.28	1,434.60	64.68	23.179			
9,200.00	9,173.73	9,268.32	9,259.01	33.07	33.02	2.91	44.76	1,972.83	1,491.02	1,425.98	65.04	22.925			
9,250.00	9,223.42	9,317.63	9,308.25	33.25	33.20	2.91	45.00	1,970.11	1,482.77	1,417.37	65.39	22.674			
9,300.00	9,273.11	9,366.94	9,357.49	33.44	33.38	2.91	45.25	1,967.39	1,474.51	1,408.76	65.75	22.426			
9,350.00	9,322.81	9,416.26	9,406.73	33.63	33.56	2.91	45.50	1,964.67	1,466.25	1,400.15	66.11	22.180			
9,400.00	9,372.50	9,465.57	9,455.96	33.82	33.74	2.91	45.74	1,961.95	1,457.99	1,391.53	66.46	21.938			
9,450.00	9,422.19	9,514.88	9,505.20	34.01	33.92	2.91	45.99	1,959.23	1,449.74	1,382.92	66.82	21.697			
9,500.00	9,471.89	9,564.20	9,554.44	34.20	34.09	2.91	46.24	1,956.51	1,441.48	1,374.31	67.17	21.459			
9,550.00	9,521.58	9,613.51	9,603.68	34.39	34.27	2.91	46.48	1,953.79	1,433.22	1,365.69	67.53	21.224			
9,600.00	9,571.27	9,662.82	9,652.92	34.58	34.45	2.91	46.73	1,951.07	1,424.96	1,357.08	67.88	20.991			
9,650.00	9,620.96	9,712.14	9,702.15	34.77	34.63	2.91	46.98	1,948.35	1,416.71	1,348.47	68.24	20.761			
9,700.00	9,670.66	9,761.45	9,751.39	34.96	34.81	2.91	47.22	1,945.63	1,408.45	1,339.85	68.60	20.533			
9,750.00	9,720.35	9,810.76	9,800.63	35.15	34.99	2.91	47.47	1,942.91	1,400.19	1,331.24	68.95	20.307			
9,800.00	9,770.04	9,860.08	9,849.87	35.34	35.17	2.91	47.72	1,940.18	1,391.93	1,322.63	69.31	20.083			
9,850.00	9,819.74	9,909.39	9,899.11	35.53	35.35	2.91	47.96	1,937.46	1,383.70	1,314.03	69.66	19.862			
9,900.00	9,869.48	9,958.79	9,948.42	35.72	35.53	2.90	48.21	1,934.74	1,375.92	1,305.90	70.02	19.650			
9,950.00	9,919.29	10,008.27	9,997.84	35.90	35.71	2.89	48.46	1,932.01	1,368.80	1,298.42	70.38	19.450			
10,000.00	9,969.15	10,055.50	10,044.99	36.09	35.88	2.88	48.69	1,929.41	1,362.33	1,291.60	70.73	19.261			
10,050.00	10,019.05	10,092.20	10,081.65	36.27	36.02	2.88	48.85	1,927.62	1,356.82	1,285.75	71.07	19.092			
10,100.00	10,068.99	10,129.02	10,118.44	36.45	36.15	2.87	48.99	1,926.18	1,352.44	1,281.04	71.40	18.942			
10,150.00	10,118.96	10,165.93	10,155.33	36.63	36.28	2.87	49.08	1,925.09	1,349.19	1,277.46	71.73	18.810			
10,200.00	10,168.95	10,200.00	10,189.39	36.80	36.40	2.86	49.15	1,924.40	1,347.08	1,275.04	72.04	18.699			
10,250.00	10,218.94	10,239.91	10,229.30	36.98	36.55	2.86	49.18	1,923.98	1,346.09	1,273.73	72.36	18.602			
10,300.00	10,268.94	10,282.65	10,272.04	37.15	36.69	89.40	49.19	1,923.92	1,345.94	1,273.25	72.69	18.516 CC			
10,350.00	10,318.94	10,332.65	10,322.04	37.32	36.87	89.40	49.19	1,923.92	1,346.00	1,273.31	72.69	18.517			
10,400.00	10,368.94	10,382.65	10,372.04	37.49	37.04	89.40	49.19	1,923.92	1,346.00	1,272.61	73.39	18.340			
10,450.00	10,418.94	10,432.65	10,422.04	37.67	37.21	89.40	49.19	1,923.92	1,346.00	1,272.26	73.74	18.253			
10,500.00	10,468.94	10,482.65	10,472.04	37.84	37.39	89.40	49.19	1,923.92	1,346.00	1,271.91	74.09	18.167			
10,550.00	10,518.94	10,532.65	10,522.04	38.01	37.56	89.40	49.19	1,923.92	1,346.00	1,271.56	74.44	18.082			
10,600.00	10,568.94	10,582.65	10,572.04	38.19	37.74	89.40	49.19	1,923.92	1,346.00	1,271.21	74.79	17.997			
10,650.00	10,618.91	10,633.08	10,622.46	38.35	37.91	-90.68	48.75	1,923.93	1,346.01	1,270.88	75.13	17.915			
10,700.00	10,668.59	10,684.14	10,673.33	38.52	38.08	-90.74	44.48	1,923.94	1,346.04	1,270.57	75.47	17.836			
10,750.00	10,717.59	10,735.33	10,723.74	38.67	38.24	-90.79	35.68	1,923.96	1,346.09	1,270.29	75.80	17.760			
10,800.00	10,765.54	10,786.63	10,773.27	38.83	38.41	-90.83	22.38	1,924.00	1,346.15	1,270.03	76.12	17.686			
10,850.00	10,812.08	10,838.04	10,821.51	38.97	38.56	-90.87	4.66	1,924.05	1,346.22	1,269.79	76.43	17.614			
10,900.00	10,856.86	10,889.55	10,868.06	39.11	38.71	-90.90	-17.36	1,924.10	1,346.31	1,269.57	76.74	17.545			
10,950.00	10,899.53	10,941.14	10,912.51	39.24	38.85	-90.93	-43.51	1,924.16	1,346.41	1,269.37	77.04	17.478			
11,000.00	10,939.76	10,992.80	10,954.48	39.36	38.98	-90.95	-73.60	1,924.26	1,346.51	1,269.19	77.33	17.413			
11,050.00	10,977.26	11,044.52	10,993.62	39.48	39.10	-90.96	-107.38	1,924.35	1,346.63	1,269.02	77.62	17.350			
11,100.00	11,011.74	11,096.27	11,029.57	39.58	39.22	-90.96	-144.58	1,924.45	1,346.76	1,268.86	77.90	17.288			
11,150.00	11,042.93	11,148.06	11,062.05	39.68	39.34	-90.96	-184.90	1,924.56	1,346.89	1,268.71	78.18	17.227			
11,200.00	11,070.60	11,199.86	11,090.75	39.78	39.46	-90.95	-228.00	1,924.67	1,347.03	1,268.57	78.46	17.167			
11,250.00	11,094.53	11,251.66	11,115.45	39.88	39.59	-90.93	-273.50	1,924.80	1,347.18	1,268.43	78.75	17.108			
11,300.00	11,114.55	11,303.44	11,135.94	39.98	39.72	-90.90	-321.04	1,924.93	1,347.33	1,268.30	79.03	17.049			
11,350.00	11,130.50	11,355.18	11,152.04	40.10	39.86	-90.87	-370.20	1,925.06	1,347.48	1,268.17	79.31	16.990			
11,400.00	11,142.26	11,406.88	11,163.63	40.22	40.01	-90.83	-420.56	1,925.20	1,347.64	1,268.04	79.59	16.931			
11,450.00	11,149.74	11,458.52	11,170.63	40.35	40.16	-90.78	-471.71	1,925.33	1,347.79	1,267.92	79.88	16.873			
11,500.00	11,152.89	11,510.08	11,173.00	40.48	40.30	-90.73	-523.20	1,925.47	1,347.95	1,267.79	80.16	16.816			
11,550.00	11,153.00	11,560.10	11,173.00	40.63	40.46	-90.72	-573.21	1,925.61	1,348.12	1,267.66	80.45	16.757			
11,600.00	11,153.00	11,610.10	11,173.00	40.78	40.62	-90.72	-623.21	1,925.74	1,348.28	1,267.53	80.75	16.696			
11,650.00	11,153.00	11,660.10	11,173.00	40.95	40.79	-90.72	-673.21	1,925.88	1,348.45	1,267.35	81.10	16.628			

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Sec 27-T25S-R31E - Lusitano 27-34 Fed Com 335H - Wellbore #1 - Permit Plan 1		Offset Site Error: 0.00 ft	
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.50 ft			
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
11,700.00	11,153.00	11,710.10	11,173.00	41.12	40.97	-90.72	-723.21	1,926.02	1,348.62	1,267.17	81.45	16.558					
11,750.00	11,153.00	11,760.10	11,173.00	41.32	41.17	-90.72	-773.21	1,926.15	1,348.79	1,266.95	81.84	16.481					
11,800.00	11,153.00	11,810.10	11,173.00	41.52	41.38	-90.72	-823.21	1,926.29	1,348.95	1,266.72	82.24	16.404					
11,850.00	11,153.00	11,860.10	11,173.00	41.73	41.60	-90.72	-873.21	1,926.42	1,349.12	1,266.45	82.67	16.318					
11,900.00	11,153.00	11,910.10	11,173.00	41.95	41.83	-90.72	-923.21	1,926.56	1,349.29	1,266.17	83.12	16.233					
11,950.00	11,153.00	11,960.09	11,173.00	42.19	42.07	-90.72	-973.21	1,926.69	1,349.46	1,265.85	83.60	16.141					
12,000.00	11,153.00	12,010.09	11,173.00	42.44	42.32	-90.72	-1,023.21	1,926.83	1,349.62	1,265.53	84.09	16.049					
12,050.00	11,153.00	12,060.09	11,173.00	42.70	42.59	-90.72	-1,073.21	1,926.96	1,349.79	1,265.17	84.62	15.951					
12,100.00	11,153.00	12,110.09	11,173.00	42.96	42.86	-90.72	-1,123.21	1,927.10	1,349.96	1,264.80	85.16	15.853					
12,150.00	11,153.00	12,160.09	11,173.00	43.24	43.14	-90.72	-1,173.21	1,927.23	1,350.13	1,264.40	85.73	15.749					
12,200.00	11,153.00	12,210.09	11,173.00	43.53	43.43	-90.72	-1,223.21	1,927.37	1,350.29	1,263.99	86.30	15.646					
12,250.00	11,153.00	12,260.09	11,173.00	43.83	43.74	-90.72	-1,273.21	1,927.50	1,350.46	1,263.55	86.92	15.537					
12,300.00	11,153.00	12,310.09	11,173.00	44.14	44.05	-90.72	-1,323.21	1,927.64	1,350.63	1,263.10	87.53	15.430					
12,350.00	11,153.00	12,360.09	11,173.00	44.46	44.38	-90.72	-1,373.21	1,927.77	1,350.80	1,262.61	88.18	15.318					
12,400.00	11,153.00	12,410.09	11,173.00	44.78	44.71	-90.72	-1,423.20	1,927.91	1,350.97	1,262.13	88.84	15.207					
12,450.00	11,153.00	12,460.09	11,173.00	45.12	45.05	-90.72	-1,473.20	1,928.05	1,351.13	1,261.60	89.53	15.092					
12,500.00	11,153.00	12,510.09	11,173.00	45.46	45.40	-90.72	-1,523.20	1,928.18	1,351.30	1,261.08	90.22	14.978					
12,550.00	11,153.00	12,560.09	11,173.00	45.82	45.76	-90.72	-1,573.20	1,928.32	1,351.47	1,260.52	90.95	14.860					
12,600.00	11,153.00	12,610.09	11,173.00	46.18	46.13	-90.72	-1,623.20	1,928.45	1,351.64	1,259.96	91.67	14.744					
12,650.00	11,153.00	12,660.09	11,173.00	46.56	46.51	-90.72	-1,673.20	1,928.59	1,351.80	1,259.37	92.43	14.625					
12,700.00	11,153.00	12,710.09	11,173.00	46.93	46.89	-90.72	-1,723.20	1,928.72	1,351.97	1,258.78	93.20	14.507					
12,750.00	11,153.00	12,760.09	11,173.00	47.33	47.28	-90.72	-1,773.20	1,928.86	1,352.14	1,258.15	93.99	14.386					
12,800.00	11,153.00	12,810.09	11,173.00	47.72	47.68	-90.72	-1,823.20	1,928.99	1,352.31	1,257.53	94.78	14.268					
12,850.00	11,153.00	12,860.09	11,173.00	48.13	48.09	-90.72	-1,873.20	1,929.13	1,352.47	1,256.87	95.60	14.147					
12,900.00	11,153.00	12,910.09	11,173.00	48.53	48.51	-90.72	-1,923.20	1,929.26	1,352.64	1,256.21	96.43	14.027					
12,950.00	11,153.00	12,960.09	11,173.00	48.96	48.93	-90.72	-1,973.20	1,929.40	1,352.81	1,255.53	97.28	13.906					
13,000.00	11,153.00	13,010.09	11,173.00	49.38	49.36	-90.72	-2,023.20	1,929.53	1,352.98	1,254.84	98.13	13.787					
13,050.00	11,153.00	13,060.09	11,173.00	49.81	49.80	-90.72	-2,073.20	1,929.67	1,353.14	1,254.13	99.01	13.666					
13,100.00	11,153.00	13,110.09	11,173.00	50.25	50.24	-90.72	-2,123.20	1,929.80	1,353.31	1,253.42	99.90	13.547					
13,150.00	11,153.00	13,160.09	11,173.00	50.70	50.69	-90.72	-2,173.20	1,929.94	1,353.48	1,252.68	100.80	13.427					
13,200.00	11,153.00	13,210.09	11,173.00	51.15	51.15	-90.72	-2,223.20	1,930.08	1,353.65	1,251.94	101.71	13.309					
13,250.00	11,153.00	13,260.09	11,173.00	51.61	51.61	-90.72	-2,273.20	1,930.21	1,353.82	1,251.18	102.64	13.190					
13,300.00	11,153.00	13,310.09	11,173.00	52.07	52.08	-90.72	-2,323.20	1,930.35	1,353.98	1,250.41	103.57	13.073					
13,350.00	11,153.00	13,360.09	11,173.00	52.54	52.55	-90.72	-2,373.20	1,930.48	1,354.15	1,249.62	104.53	12.955					
13,400.00	11,153.00	13,410.09	11,173.00	53.02	53.03	-90.71	-2,423.20	1,930.62	1,354.32	1,248.84	105.48	12.839					
13,450.00	11,153.00	13,460.09	11,173.00	53.50	53.52	-90.71	-2,473.20	1,930.75	1,354.49	1,248.03	106.46	12.723					
13,500.00	11,153.00	13,510.09	11,173.00	53.98	54.01	-90.71	-2,523.19	1,930.89	1,354.65	1,247.22	107.44	12.609					
13,550.00	11,153.00	13,560.09	11,173.00	54.48	54.51	-90.71	-2,573.19	1,931.02	1,354.82	1,246.39	108.44	12.494					
13,600.00	11,153.00	13,610.09	11,173.00	54.98	55.01	-90.71	-2,623.19	1,931.16	1,354.99	1,245.55	109.44	12.382					
13,650.00	11,153.00	13,660.09	11,173.00	55.48	55.52	-90.71	-2,673.19	1,931.29	1,355.16	1,244.70	110.45	12.269					
13,700.00	11,153.00	13,710.08	11,173.00	55.99	56.03	-90.71	-2,723.19	1,931.43	1,355.32	1,243.85	111.47	12.158					
13,750.00	11,153.00	13,760.08	11,173.00	56.50	56.54	-90.71	-2,773.19	1,931.56	1,355.49	1,242.98	112.51	12.048					
13,800.00	11,153.00	13,810.08	11,173.00	57.01	57.06	-90.71	-2,823.19	1,931.70	1,355.66	1,242.11	113.55	11.939					
13,850.00	11,153.00	13,860.08	11,173.00	57.54	57.59	-90.71	-2,873.19	1,931.83	1,355.83	1,241.22	114.60	11.831					
13,900.00	11,153.00	13,910.08	11,173.00	58.06	58.12	-90.71	-2,923.19	1,931.97	1,355.99	1,240.34	115.66	11.724					
13,950.00	11,153.00	13,960.08	11,173.00	58.59	58.65	-90.71	-2,973.19	1,932.11	1,356.16	1,239.43	116.73	11.618					
14,000.00	11,153.00	14,010.08	11,173.00	59.13	59.19	-90.71	-3,023.19	1,932.24	1,356.33	1,238.53	117.80	11.513					
14,050.00	11,153.00	14,060.08	11,173.00	59.67	59.73	-90.71	-3,073.19	1,932.38	1,356.50	1,237.61	118.89	11.410					
14,100.00	11,153.00	14,110.08	11,173.00	60.21	60.28	-90.71	-3,123.19	1,932.51	1,356.67	1,236.68	119.98	11.307					
14,150.00	11,153.00	14,160.08	11,173.00	60.75	60.83	-90.71	-3,173.19	1,932.65	1,356.83	1,235.75	121.08	11.206					
14,200.00	11,153.00	14,210.08	11,173.00	61.30	61.38	-90.71	-3,223.19	1,932.78	1,357.00	1,234.81	122.19	11.106					
14,250.00	11,153.00	14,260.08	11,173.00	61.86	61.94	-90.71	-3,273.19	1,932.92	1,357.17	1,233.86	123.31	11.007					

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error: 0.00 ft	
Survey Program: 0-MWD+HDCM														Offset Well Error: 0.50 ft	
Reference															
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N-S (ft)	+E-W (ft)	(ft)	(ft)	(ft)			
14,300.00	11,153.00	14,310.08	11,173.00	62.41	62.50	-90.71	-3,323.19	1,933.05	1,357.34	1,232.91	124.42	10.909			
14,350.00	11,153.00	14,360.08	11,173.00	62.98	63.06	-90.71	-3,373.19	1,933.19	1,357.50	1,231.95	125.55	10.812			
14,400.00	11,153.00	14,410.08	11,173.00	63.54	63.63	-90.71	-3,423.19	1,933.32	1,357.67	1,230.98	126.69	10.717			
14,450.00	11,153.00	14,460.08	11,173.00	64.11	64.20	-90.71	-3,473.19	1,933.46	1,357.84	1,230.01	127.83	10.622			
14,500.00	11,153.00	14,510.08	11,173.00	64.67	64.77	-90.71	-3,523.19	1,933.59	1,358.01	1,229.03	128.98	10.529			
14,550.00	11,153.00	14,560.08	11,173.00	65.25	65.35	-90.71	-3,573.18	1,933.73	1,358.17	1,228.04	130.13	10.437			
14,600.00	11,153.00	14,610.08	11,173.00	65.82	65.93	-90.71	-3,623.18	1,933.87	1,358.34	1,227.05	131.29	10.346			
14,650.00	11,153.00	14,660.08	11,173.00	66.41	66.51	-90.71	-3,673.18	1,934.00	1,358.51	1,226.05	132.45	10.256			
14,700.00	11,153.00	14,710.08	11,173.00	66.99	67.09	-90.71	-3,723.18	1,934.14	1,358.68	1,225.05	133.63	10.168			
14,750.00	11,153.00	14,760.08	11,173.00	67.57	67.68	-90.71	-3,773.18	1,934.27	1,358.84	1,224.04	134.80	10.080			
14,800.00	11,153.00	14,810.08	11,173.00	68.16	68.27	-90.71	-3,823.18	1,934.41	1,359.01	1,223.03	135.98	9.994			
14,850.00	11,153.00	14,860.08	11,173.00	68.75	68.87	-90.71	-3,873.18	1,934.54	1,359.18	1,222.01	137.17	9.909			
14,900.00	11,153.00	14,910.08	11,173.00	69.34	69.46	-90.71	-3,923.18	1,934.68	1,359.35	1,220.98	138.36	9.825			
14,950.00	11,153.00	14,960.08	11,173.00	69.94	70.06	-90.71	-3,973.18	1,934.81	1,359.51	1,219.95	139.56	9.741			
15,000.00	11,153.00	15,010.08	11,173.00	70.53	70.66	-90.71	-4,023.18	1,934.95	1,359.68	1,218.92	140.76	9.659			
15,050.00	11,153.00	15,060.08	11,173.00	71.14	71.26	-90.71	-4,073.18	1,935.08	1,359.85	1,217.88	141.97	9.578			
15,100.00	11,153.00	15,110.08	11,173.00	71.74	71.87	-90.71	-4,123.18	1,935.22	1,360.02	1,216.84	143.18	9.499			
15,150.00	11,153.00	15,160.08	11,173.00	72.34	72.48	-90.71	-4,173.18	1,935.35	1,360.19	1,215.79	144.40	9.420			
15,200.00	11,153.00	15,210.08	11,173.00	72.95	73.08	-90.71	-4,223.18	1,935.49	1,360.35	1,214.74	145.62	9.342			
15,250.00	11,153.00	15,260.08	11,173.00	73.56	73.70	-90.71	-4,273.18	1,935.62	1,360.52	1,213.68	146.84	9.265			
15,300.00	11,153.00	15,310.08	11,173.00	74.17	74.31	-90.71	-4,323.18	1,935.76	1,360.69	1,212.62	148.07	9.190			
15,350.00	11,153.00	15,360.08	11,173.00	74.78	74.93	-90.71	-4,373.18	1,935.90	1,360.86	1,211.55	149.30	9.115			
15,400.00	11,153.00	15,410.08	11,173.00	75.40	75.54	-90.71	-4,423.18	1,936.03	1,361.02	1,210.49	150.54	9.041			
15,450.00	11,153.00	15,460.08	11,173.00	76.02	76.16	-90.71	-4,473.18	1,936.17	1,361.19	1,209.41	151.78	8.968			
15,500.00	11,153.00	15,510.07	11,173.00	76.63	76.79	-90.71	-4,523.18	1,936.30	1,361.36	1,208.34	153.02	8.897			
15,550.00	11,153.00	15,560.07	11,173.00	77.26	77.41	-90.71	-4,573.18	1,936.44	1,361.53	1,207.26	154.27	8.826			
15,600.00	11,153.00	15,610.07	11,173.00	77.88	78.03	-90.71	-4,623.18	1,936.57	1,361.69	1,206.18	155.52	8.756			
15,650.00	11,153.00	15,660.07	11,173.00	78.50	78.66	-90.71	-4,673.17	1,936.71	1,361.86	1,205.09	156.78	8.687			
15,700.00	11,153.00	15,710.07	11,173.00	79.13	79.29	-90.71	-4,723.17	1,936.84	1,362.03	1,204.00	158.03	8.619			
15,750.00	11,153.00	15,760.07	11,173.00	79.76	79.92	-90.71	-4,773.17	1,936.98	1,362.20	1,202.90	159.29	8.551			
15,800.00	11,153.00	15,810.07	11,173.00	80.39	80.55	-90.71	-4,823.17	1,937.11	1,362.36	1,201.81	160.56	8.485			
15,850.00	11,153.00	15,860.07	11,173.00	81.02	81.19	-90.71	-4,873.17	1,937.25	1,362.53	1,200.71	161.83	8.420			
15,900.00	11,153.00	15,910.07	11,173.00	81.65	81.82	-90.71	-4,923.17	1,937.38	1,362.70	1,199.60	163.10	8.355			
15,950.00	11,153.00	15,960.07	11,173.00	82.29	82.46	-90.71	-4,973.17	1,937.52	1,362.87	1,198.50	164.37	8.291			
16,000.00	11,153.00	16,010.07	11,173.00	82.92	83.10	-90.71	-5,023.17	1,937.65	1,363.04	1,197.39	165.65	8.229			
16,050.00	11,153.00	16,060.07	11,173.00	83.56	83.74	-90.71	-5,073.17	1,937.79	1,363.20	1,196.28	166.93	8.166			
16,100.00	11,153.00	16,110.07	11,173.00	84.20	84.38	-90.71	-5,123.17	1,937.93	1,363.37	1,195.16	168.21	8.105			
16,150.00	11,153.00	16,160.07	11,173.00	84.84	85.02	-90.71	-5,173.17	1,938.06	1,363.54	1,194.04	169.50	8.045			
16,200.00	11,153.00	16,210.07	11,173.00	85.48	85.66	-90.71	-5,223.17	1,938.20	1,363.71	1,192.92	170.78	7.985			
16,250.00	11,153.00	16,260.07	11,173.00	86.12	86.31	-90.71	-5,273.17	1,938.33	1,363.87	1,191.80	172.07	7.926			
16,300.00	11,153.00	16,310.07	11,173.00	86.77	86.95	-90.71	-5,323.17	1,938.47	1,364.04	1,190.68	173.37	7.868			
16,350.00	11,153.00	16,360.07	11,173.00	87.41	87.60	-90.71	-5,373.17	1,938.60	1,364.21	1,189.55	174.66	7.811			
16,400.00	11,153.00	16,410.07	11,173.00	88.06	88.25	-90.71	-5,423.17	1,938.74	1,364.38	1,188.42	175.96	7.754			
16,450.00	11,153.00	16,460.07	11,173.00	88.71	88.90	-90.71	-5,473.17	1,938.87	1,364.54	1,187.28	177.26	7.698			
16,500.00	11,153.00	16,510.07	11,173.00	89.36	89.55	-90.71	-5,523.17	1,939.01	1,364.71	1,186.15	178.56	7.643			
16,550.00	11,153.00	16,560.07	11,173.00	90.01	90.20	-90.71	-5,573.17	1,939.14	1,364.88	1,185.01	179.87	7.588			
16,600.00	11,153.00	16,610.07	11,173.00	90.66	90.86	-90.71	-5,623.17	1,939.28	1,365.05	1,183.87	181.17	7.534			
16,650.00	11,153.00	16,660.07	11,173.00	91.31	91.51	-90.71	-5,673.17	1,939.41	1,365.21	1,182.73	182.49	7.481			
16,700.00	11,153.00	16,710.07	11,173.00	91.96	92.17	-90.71	-5,723.16	1,939.55	1,365.38	1,181.59	183.80	7.429			
16,750.00	11,153.00	16,760.07	11,173.00	92.62	92.82	-90.71	-5,773.16	1,939.68	1,365.55	1,180.44	185.11	7.377			
16,800.00	11,153.00	16,810.07	11,173.00	93.28	93.48	-90.71	-5,823.16	1,939.82	1,365.72	1,179.29	186.43	7.326			
16,850.00	11,153.00	16,860.07	11,173.00	93.93	94.14	-90.71	-5,873.16	1,939.96	1,365.89	1,178.14	187.74	7.275			

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Offset Design Sec 27-T25S-R31E - Lusitano 27-34 Fed Com 335H - Wellbore #1 - Permit Plan 1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD+HDGM												Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre N-S (ft)	Offset Wellbore Centre E-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
16,900.00	11,153.00	16,910.07	11,173.00	94.59	94.80	-90.71	-5,923.16	1,940.09	1,366.05	1,176.99	189.06	7.225	
16,950.00	11,153.00	16,960.07	11,173.00	95.25	95.46	-90.71	-5,973.16	1,940.23	1,366.22	1,175.83	190.39	7.176	
17,000.00	11,153.00	17,010.07	11,173.00	95.91	96.12	-90.71	-6,023.16	1,940.36	1,366.39	1,174.68	191.71	7.127	
17,050.00	11,153.00	17,060.07	11,173.00	96.57	96.79	-90.71	-6,073.16	1,940.50	1,366.56	1,173.52	193.04	7.079	
17,100.00	11,153.00	17,110.07	11,173.00	97.23	97.45	-90.71	-6,123.16	1,940.63	1,366.72	1,172.36	194.36	7.032	
17,150.00	11,153.00	17,160.07	11,173.00	97.89	98.11	-90.71	-6,173.16	1,940.77	1,366.89	1,171.20	195.69	6.985	
17,200.00	11,153.00	17,210.07	11,173.00	98.56	98.78	-90.71	-6,223.16	1,940.90	1,367.06	1,170.04	197.02	6.939	
17,250.00	11,153.00	17,260.07	11,173.00	99.22	99.45	-90.71	-6,273.16	1,941.04	1,367.23	1,168.87	198.36	6.893	
17,300.00	11,153.00	17,310.06	11,173.00	99.89	100.11	-90.71	-6,323.16	1,941.17	1,367.39	1,167.70	199.69	6.848	
17,327.72	11,153.00	17,337.79	11,173.00	100.26	100.48	-90.71	-6,350.88	1,941.25	1,367.49	1,167.06	200.43	6.823 ES, SF	

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Reference Depths are relative to RKB @ 3360.20ft

Offset Depths are relative to Offset Datum

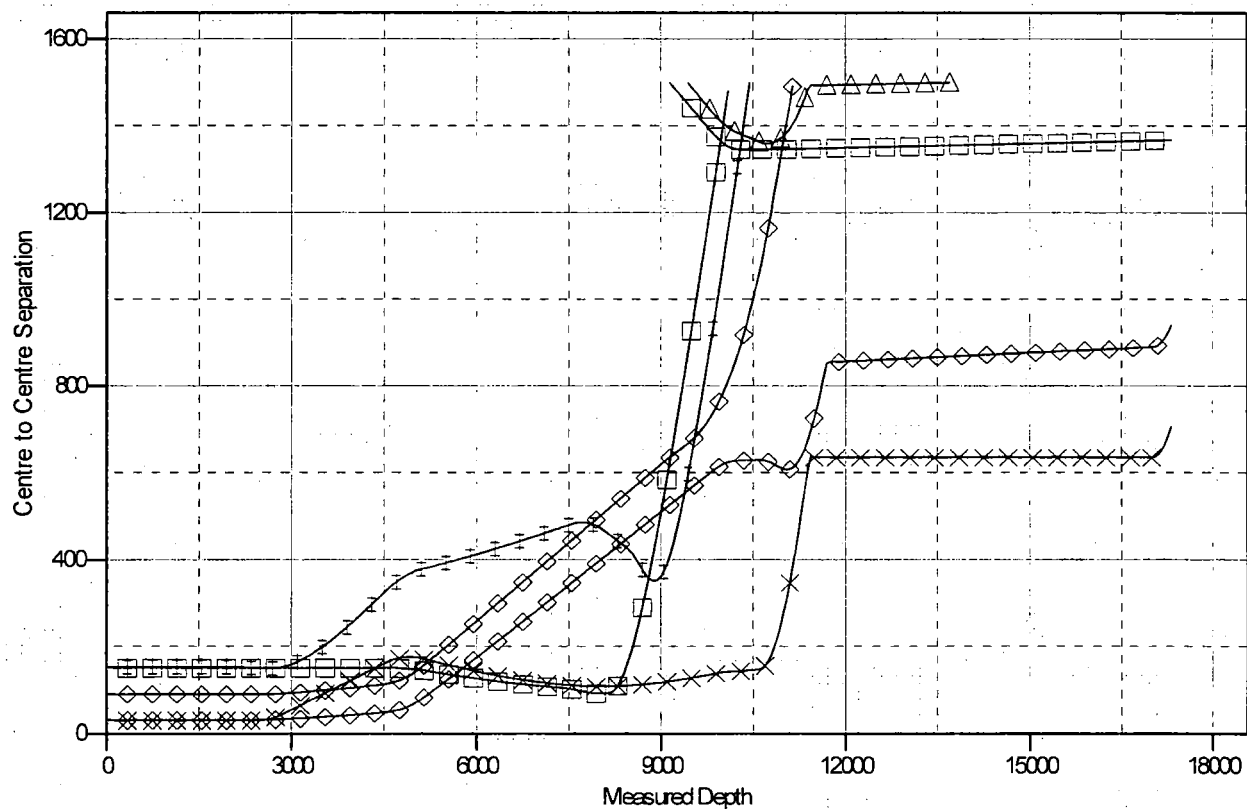
Central Meridian is -104.333334

Coordinates are relative to: Lusitano 27-34 Fed Com 333H

Coordinate System is US State Plane 1983, New Mexico Eastern Zone

Grid Convergence at Surface is: 0.30°

Ladder Plot



LEGEND

Lusitano 27_34 Fed Com 534H, Wellbore #1, Permit Plan 1 V0	Lusitano 27_34 Fed Com 713H, Wellbore #1, Permit Plan 2 V0	Lusitano 27-34 Fed Com 335H, Wellbore #1, Permit Plan 1 V0
Lusitano 27_34 Fed Com 621H, Wellbore #1, Permit Plan 2 V0	Lusitano 27_34 Fed Com 523H, Wellbore #1, Permit Plan 1 V0	
Lusitano 27_34 Fed Com 716H, Wellbore #1, Permit Plan 1 V0	Lusitano 27_22 Fed Com 332H, Wellbore #1, Permit Plan 1 V0	

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

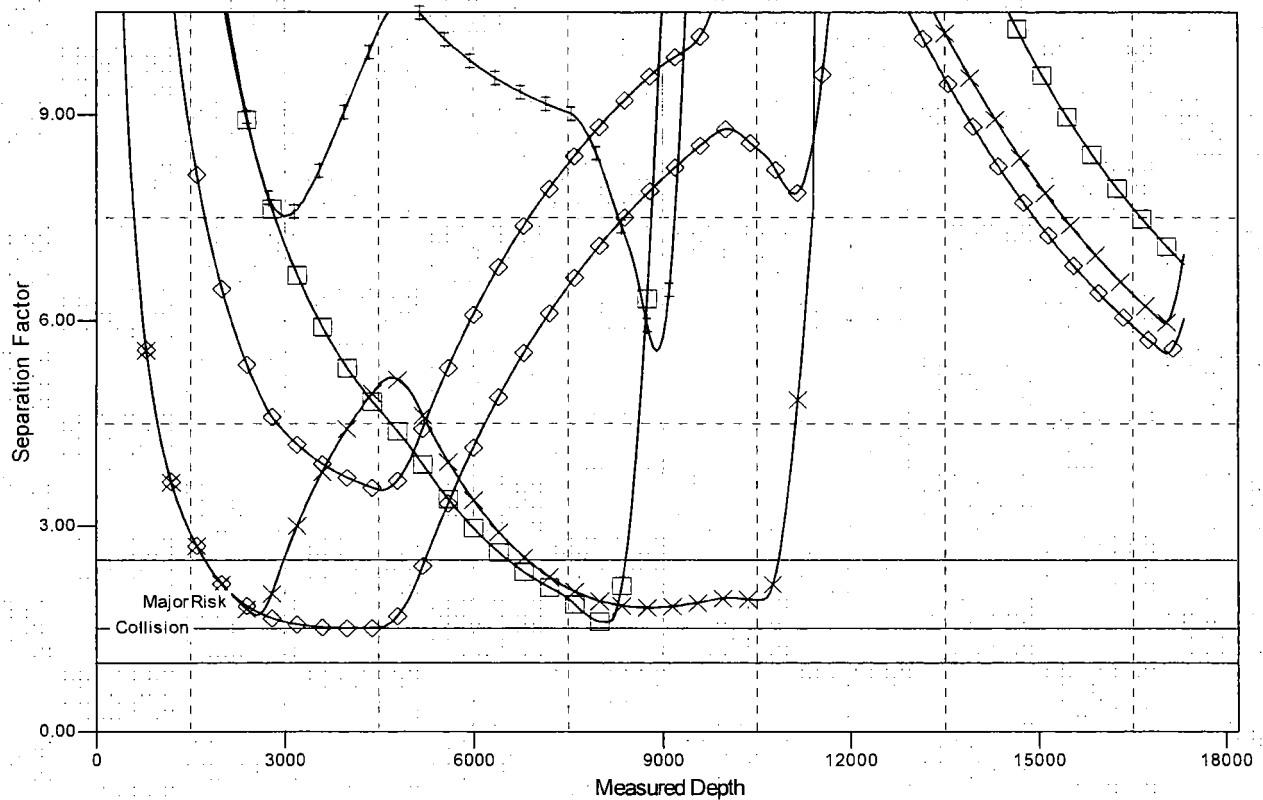
Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Lusitano 27-34 Fed Com 333H
Project:	Eddy County (NAD 83 NM Eastern)	TVD Reference:	RKB @ 3360.20ft
Reference Site:	Sec 27-T25S-R31E	MD Reference:	RKB @ 3360.20ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Lusitano 27-34 Fed Com 333H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.50 ft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	EDM r5000.141_Prod US
Reference Design:	Permit Plan 2	Offset TVD Reference:	Offset Datum

Reference Depths are relative to RKB @ 3360.20ft
 Offset Depths are relative to Offset Datum
 Central Meridian is -104.333334

Coordinates are relative to: Lusitano 27-34 Fed Com 333H
 Coordinate System is US State Plane 1983, New Mexico Eastern Zone
 Grid Convergence at Surface is: 0.30°

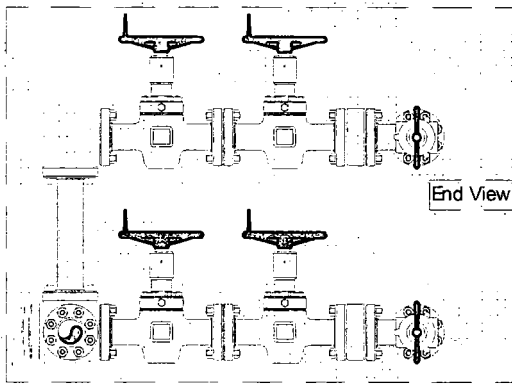
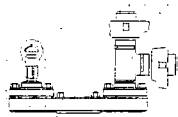
Separation Factor Plot



LEGEND

Lusitano 27_34 Fed Com 534H, Wellbore #1, Permit Plan 1 V0	Lusitano 27_34 Fed Com 713H, Wellbore #1, Permit Plan 2 V0	Lusitano 27-34 Fed Com 333H, Wellbore #1, Permit Plan 1 V0
Lusitano 27_34 Fed Com 822H, Wellbore #1, Permit Plan 2 V0	Lusitano 27_34 Fed Com 523H, Wellbore #1, Permit Plan 1 V0	
Lusitano 27_34 Fed Com 716H, Wellbore #1, Permit Plan 1 V0	Lusitano 27_22 Fed Com 232H, Wellbore #1, Permit Plan 1 V0	

Note: all valves & lines on choke manifold are 3" unless otherwise noted. Exact manifold configuration may vary.



Top choke will be hydraulic.

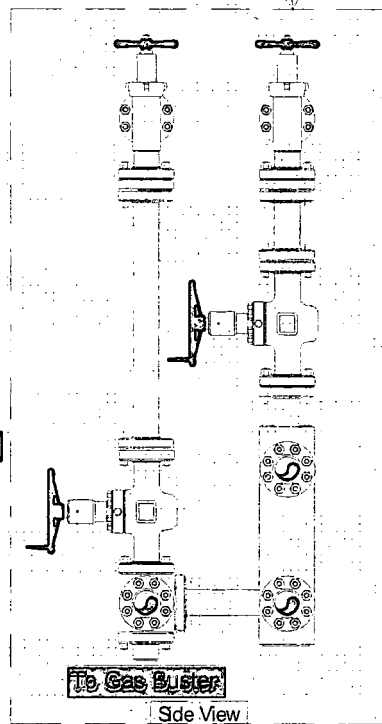
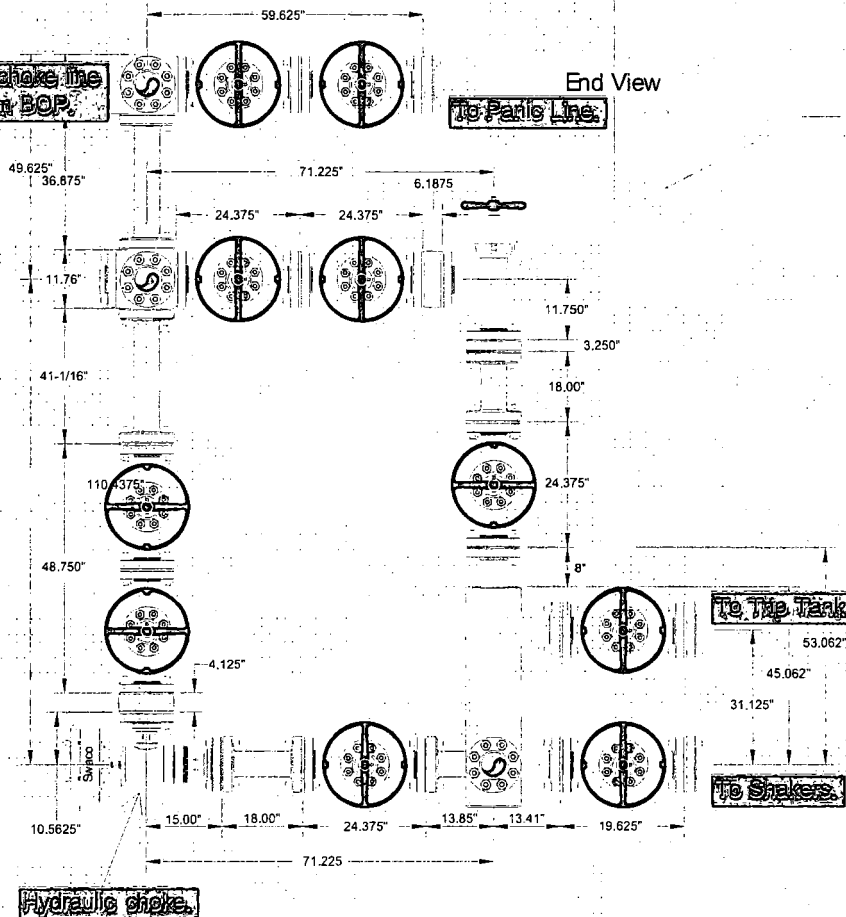
Bottom choke will be manual.

Flexible choke line
Injection BOP.

To Paro Line.

End View

Side View



Helmerich & Payne
Flex 3 Rig w/ 3 Chokes

devon

Devon Energy Annular Preventer Summary

1. Component and Preventer Compatibility Table

The table below, which covers the drilling and casing of the 10M MASP portion of the well, outlines the tubulars and the compatible preventers in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

6-3/4" Production hole section, 10M requirement

Component	OD	Preventer	RWP
Drillpipe	4.5"	Fixed lower 4.5" Upper 4.5-7" VBR	10M
HWDP	4.5"	Fixed lower 4.5" Upper 4.5-7" VBR	10M
Drill collars and MWD tools	4.75"	Upper 4.5-7" VBR	10M
Mud Motor	4.75"	Upper 4.5-7" VBR	10M
Production casing	5.5"	Upper 4.5-7" VBR	10M
ALL	0-13-5/8"	Annular	5M
Open-hole	-	Blind Rams	10M

VBR = Variable Bore Ram. Compatible range listed in chart.

2. Well Control Procedures

Well control procedures are specific to the rig equipment and the operation at the time the kick occurs. Below are the minimal high-level tasks prescribed to assure a proper shut-in while drilling, tripping, running casing, pipe out of the hole (open hole), and moving the BHA through the BOPs. The pressure at which control is swapped from the annular to another compatible ram is variable, but the operator will document in the submission their operating pressure limit. The operator may choose an operating pressure less than or equal to RWP, but in no case will it exceed the RWP of the annular preventer.

General Procedure While Drilling

1. Sound alarm (alert crew)
2. Space out drill string
3. Shut down pumps (stop pumps and rotary)
4. Shut-in Well (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
 - a. SIDPP and SICP
 - b. Pit gain
 - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach the RWP of the annular preventer, confirm spacing and swap to the upper pipe ram.

Devon Energy Annular Preventer Summary

General Procedure While Tripping

1. Sound alarm (alert crew)
2. Stab full opening safety valve and close
3. Space out drill string
4. Shut-in (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
 - a. SIDPP and SICP
 - b. Pit gain
 - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach the RWP of the annular preventer, confirm spacing and swap to the upper pipe ram.

General Procedure While Running Casing

1. Sound alarm (alert crew)
2. Stab crossover and full opening safety valve and close
3. Space out string
4. Shut-in (uppermost applicable BOP, typically annular preventer first. HCR and choke will already be in the closed position.)
5. Confirm shut-in
6. Notify toolpusher/company representative
7. Read and record the following:
 - a. SIDPP and SICP
 - b. Pit gain
 - c. Time
8. Regroup and identify forward plan
9. If pressure has built or is anticipated during the kill to reach the RWP of the annular preventer, confirm spacing and swap to compatible pipe ram.

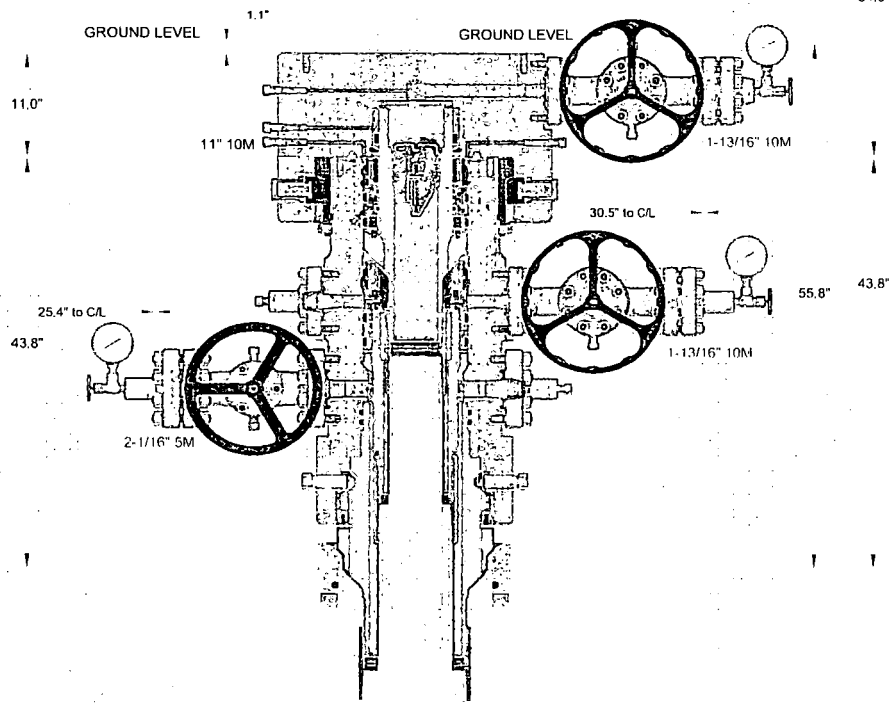
General Procedure With No Pipe In Hole (Open Hole)

1. Sound alarm (alert crew)
2. Shut-in with blind rams or BSR. (HCR and choke will already be in the closed position.)
3. Confirm shut-in
4. Notify toolpusher/company representative
5. Read and record the following:
 - a. SICP
 - b. Pit gain
 - c. Time
6. Regroup and identify forward plan

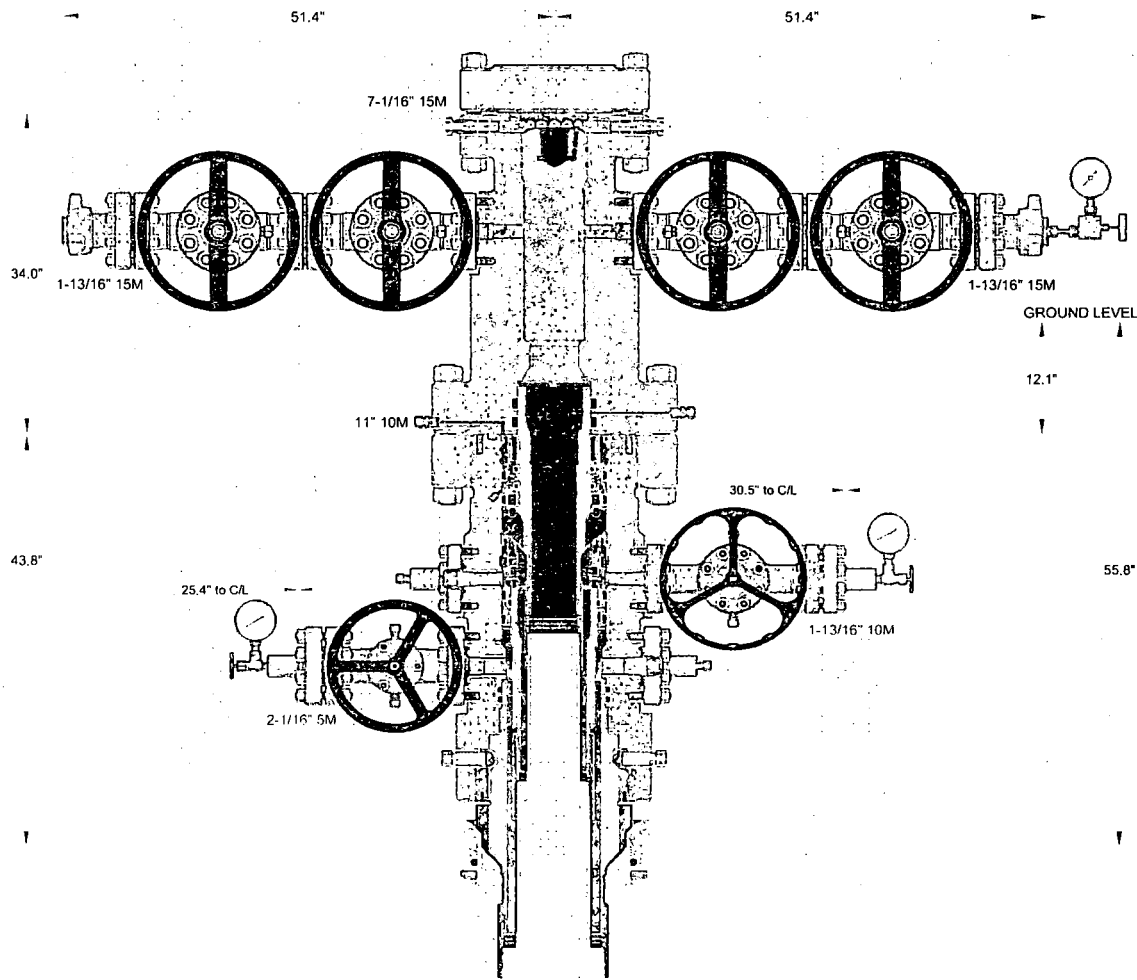
Devon Energy Annular Preventer Summary

General Procedures While Pulling BHA thru Stack

1. PRIOR to pulling last joint of drillpipe thru the stack.
 - a. Perform flowcheck, if flowing:
 - b. Sound alarm (alert crew)
 - c. Stab full opening safety valve and close
 - d. Space out drill string with tool joint just beneath the upper pipe ram.
 - e. Shut-in using upper pipe ram. (HCR and choke will already be in the closed position.)
 - f. Confirm shut-in
 - g. Notify toolpusher/company representative
 - h. Read and record the following:
 - i. SIDPP and SICP
 - ii. Pit gain
 - iii. Time
 - i. Regroup and identify forward plan
2. With BHA in the stack and compatible ram preventer and pipe combo immediately available.
 - a. Sound alarm (alert crew)
 - b. Stab crossover and full opening safety valve and close
 - c. Space out drill string with upset just beneath the compatible pipe ram.
 - d. Shut-in using compatible pipe ram. (HCR and choke will already be in the closed position.)
 - e. Confirm shut-in
 - f. Notify toolpusher/company representative
 - g. Read and record the following:
 - i. SIDPP and SICP
 - ii. Pit gain
 - iii. Time
 - h. Regroup and identify forward plan
3. With BHA in the stack and NO compatible ram preventer and pipe combo immediately available.
 - a. Sound alarm (alert crew)
 - b. If possible to pick up high enough, pull string clear of the stack and follow "Open Hole" scenario.
 - c. If impossible to pick up high enough to pull the string clear of the stack:
 - d. Stab crossover, make up one joint/stand of drillpipe, and full opening safety valve and close
 - e. Space out drill string with tooljoint just beneath the upper pipe ram.
 - f. Shut-in using upper pipe ram. (HCR and choke will already be in the closed position.)
 - g. Confirm shut-in
 - h. Notify toolpusher/company representative
 - i. Read and record the following:
 - i. SIDPP and SICP
 - ii. Pit gain
 - iii. Time
 - j. Regroup and identify forward plan



Conductor Pipe
10-3/4" Casing
7-5/8" Casing
5-1/2" Casing



Conductor Pipe
10-3/4" Casing
7-5/8" Casing
5-1/2" Casing

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ALL DIMENSIONS APPROXIMATE

CACTUS WELLHEAD LLC

DEVON ENERGY CORPORATION

10-3/4" x 7-5/8" x 5-1/2" 5M MBU-T-CFL-R-DBLO Wellhead System
With 7-5/8" & 5-1/2" Pin Down Rotating Mandrel Hangers,
13-5/8" 5M x 11" 10M DSPA & 11" 10M x 7-1/16" 15M Tubing Head

DLE 20NOV18

ODE0001804



Quotation

Quote Number : ODE0001804

ODESSA WAREHOUSE
8001 GROENING STREET
ODESSA TX 79765
Phone: 432-653-0306

Date: 10/19/2018

Valid For 30 Days

Page 1 of 8

Bill To: 7323

DEVON ENERGY CORPORATION
PO BOX 3198
OKLAHOMA CITY OK 73101-3198
US

Ship To: 0

DEVON ENERGY CORPORATION
PO BOX 3198
OKLAHOMA CITY OK 73101-3198
US

Quantity	Price	Ext Price
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MBU-T-CFL-R 10-3/4"

DEVON ENERGY

DELAWARE BASIN

MBU-T-CFL-R ASSEMBLY

10-3/4" X 7-5/8" X 5-1/2"

QUOTATION SUMMARY:

- MBU-T ASSEMBLY - \$24,148.80
- MANDREL HANGERS & PACKOFFS - \$18,231.00
- TUBING HEAD ASSEMBLY - \$28,243.20
- RENTAL TOOLS = \$4,075.00 PER WELL FOR THE FIRST 45 DAYS; \$220.00 PER DAY THEREAFTER

CACTUS CONTACT:

SCOTT NORDQUIST

MOBILE: 832.803.5055

EMAIL: scott.nordquist@cactuswellhead.com

NOTE: PRICES ARE F.O.B. CACTUS BOSSIER CITY, LA. THE FOLLOWING QUOTATION DOES NOT INCLUDE PRO RATA FREIGHT AND OTHER APPLICABLE MILEAGE AND SERVICES THAT WILL BE CHARGED AT TIME OF INVOICING.



Quotation

ODESSA WAREHOUSE
8001 GROENING STREET
ODESSA TX 79765
Phone: 432-653-0306

Quote Number : ODE0001804

Date: 10/19/2018

Valid For 30 Days

Page 2 of 8

		Quantity	Price	Ext Price
MBU-T-CFL-R ASSEMBLY				
1	125867 HSG,CW,MBU-T-CFL-R-DBLO-SF,10-3/4,11 10M,W/2 1-13/16 10M FP UPR & 2 2-1/16 5M FP LWR,RND BAR,W/O 11 10M THD FLG,6A-PU-EE-NL-1-2	1.00	9,775.00	9,775.00
2	103030 FLG,THD,11 10M W/17.375-2 STUB ACME-2G L.H. THD,4130 75K & I/T -75 DEG F,PSL2	1.00	1,735.00	1,735.00
3	101970 LANDING RING,CW,CTF,16 CSG X 20 OD X 15.25 ID,W/1/2-13UNC-2B LIFT HOLE	1.00	1,500.00	1,500.00
4	117696 CSGHGR,CW,MBU-T-CFL-R,10-3/4,10-3/4 (45.5#) BC PIN BTM X 11.250-4 STUB ACME-2G LEFT HAND PIN TOP,9.945 MIN BORE,4140 110K,6A-U-AA-1-2	1.00	7,691.00	7,691.00
5	125819 CSGHGR,CW,MBU-T-CFL-R,10-3/4,10-3/4 (45.5#) BC PIN BTM X 11.250-4 STUB ACME-2G LEFT HAND PIN TOP,9.945 MIN BORE,4130 75K,6A-PU-DD-NL-1-2	0.00	7,691.00	0.00
6	VR2 VR PLUG,CW,1-1/2 (1.900) SHARP VEE X 1-1/4 HEX,API 6A-DD-NL	1.00	30.00	30.00
7	610003N VLV,CW1,2-1/16 3/5M FE AA/DD-NL (API 6A LU AA/DD-NL PSL1 PR2) NON-MONOGRAMMED	1.00	759.00	759.00
8	200002 FLG,COMP,CW,2-1/16 5M X 2 LP,6A-KU-EE-NL-1	2.00	73.60	147.20
9	BP2T BULL PLUG,CW,2 LP X 1/2 LP,API 6A DD-NL	2.00	25.04	50.08
10	FTG1 FTG,GRS,VENTED CAP,1/2 NPT,ALLOY NON-NACE	1.00	6.85	6.85
11	R24 RING GASKET,R24,2-1/16 3/5M	3.00	5.48	16.44
12	780067 STUD.ALL-THD,W/2 NUTS,BLK.7/8-9UNC X 6-1/2,A193 GR B7/A194 GR 2H.NO PLATING	8.00	2.35	18.80
13	NVA NEEDLE VALVE,MFA,1/2 10M	1.00	47.25	47.25
14	PG5M PRESSURE GAUGE,5M,4-1/2 FACE,LIQUID FILLED,1/2 NPT	1.00	47.88	47.88
15	VR1 VR PLUG,CW,1-1/4 (1.660) LP X 1-1/4 HEX,API 6A-DD-NL	1.00	39.12	39.12
16	FTG1 FTG,GRS,VENTED CAP,1/2 NPT,ALLOY NON-NACE	1.00	6.85	6.85
17	107412 VLV,CW,SB100,1-13/16 10M FE BB/EE-0,5 (API 6A LU BB/EE-0,5 PSL3 PR2) QPQ TRIM, API 6A PR2 ANNEX F	1.00	1,950.00	1,950.00



Quotation

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ODESSA WAREHOUSE
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		Quantity	Price	Ext Price
18	200010 FLG,COMP,1-13/16 10M X 2 LP,5000 PSI MAX WP,4130 60K,6A-KU-EE-NL-1	2.00	74.33	148.66
19	BX151 RING GASKET,BX151,1-13/16 10/15/20M	3.00	6.26	18.78
20	780080 STUD,ALL-THD W/2 NUTS,BLK,3/4-10UNC X 5-1/2,A193 GR B7/A194 GR 2H,NO PLATING	8.00	1.96	15.68
21	BP2T BULL PLUG,CW,2 LP X 1/2 LP,API 6A DD-NL	2.00	25.04	50.08
22	NVA NEEDLE VALVE,MFA,1/2 10M	1.00	47.25	47.25
23	PG5M PRESSURE GAUGE,5M,4-1/2 FACE,LIQUID FILLED,1/2 NPT	1.00	47.88	47.88
				24,148.80

CASING HANGERS & PACKOFFS

24	120272 CSGHGR,CW,MBU-LR2-TP6,FLUTED,11 X 7-5/8 (29.7#) BC PIN BTM X 7.750-4 STUB ACME-2G RIGHT HAND BOX TOP,6A-U-AA-1-1	1.00	5,955.00	5,955.00
25	108908T PACKOFF,CW,MBU-LR.MANDREL,11 10M NOM,W/7.500-4 STUB ACME-2G LH BOX TOP,A/F LANDING HGR NECK,6A-U-AA-1-1	1.00	3,600.00	3,600.00
26	121451 CSGHGR,CW,MBU-LR-UPR-TP8,SN,FLUTED,7-5/8,11 X 5-1/2 (20#) VAM TOP HT PIN BTM X 6.125 4 STUB ACME-2G RIGHT HAND BOX TOP,W/5 HBPV THD,SPEC FOR ROTATING CASING STRING,,6A-U-AA-1-2	1.00	6,876.00	6,876.00
27	120079 PACKOFF,CW,CTF-MBU-3T,11,A/F 7.75 SEAL PREP,W/8.750-4 STUB ACME-2G LH BOX TOP,10000 PSI MAX WP,A/F LANDING ON 45 DEG SHOULDER ON HANGER,6A-U-AA-2-2	1.00	1,800.00	1,800.00
28	BPV5T BPV,H,5 ONE WAY,4130,HYDRO TESTED & API 6A MONOGRAM	0.00	2,950.00	0.00

NOTE:
OPTIONAL SALE ITEM; PRICE NOT INCLUDED IN TOTAL
OPTIONAL RENTAL RATE = \$90.00 PER DAY

18,231.00

RENTAL TOOLS

29	RNM Rental Charge Minimum	1.00	4,075.00	4,075.00
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MBU-T RENTAL TOOLS = \$4,075.00 PER WELL FOR THE FIRST 45 DAYS; \$220.00 PER DAY THEREAFTER.

RENTAL TOOLS INCLUDE THE FOLLOWING ITEMS:

PN 119126 - LIFT RING,CSGHGR,CFL-R,W/14.000-2 STUB ACME-2G LEFT HAND THDS,4140 110K (\$200.00; \$10.00)

PN 120868: RUN TOOL,CW,CSGHGR,MBU-T-CFL-10-7/8,11.250-4 STUB ACME-2G LH BOX BTM X 10-3/4 BC BOX



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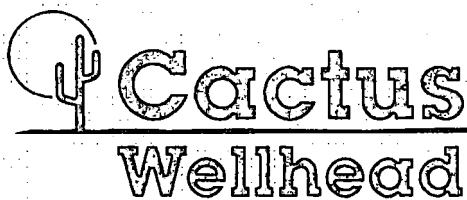
	Quantity	Price	Ext Price
TOP,W/10.00 MIN BORE,MAX LOAD CAPACITY 1500K (\$200.00; \$10.00)			
PN 117695: TORQUE COLLAR,CW,CSGHGR,CFL,F/13-3/8 NECK,4140 110K (\$100.00; \$5.00)			
PN 800001: COMB TEST PLUG/RET TOOL,CW,11 X 4-1/2 IF (NC50) BOX BTM & TOP,W/1-1/4 LP BYPASS & SPRING LOADED DOGS (\$250.00; \$15.00)			
PN 102332: WBUSH,CW,MBU-LR,LWR,11 X 10.00 ID X 25.00 LG (\$250.00; \$15.00)			
PN 120274: RUN TOOL,CW,CSGHGR,TP6,7.750-4 STUB ACME-2G RIGHT HAND PIN BTM X 7-5/8 BC BOX TOP,W/6.535 MIN BORE & MAXIMUM TORQUE 25000 LBS-FT SPEC FOR ROTATING CASING STRING (\$575.00;\$30.00)			
PN 117945: TORQUE COLLAR,CW,F/USE W RUN TOOL,TP,7.750-4 STUB ACME-2G RIGHT HAND PIN BTM AND A/F 9.00 OD X 5.00 LG BOX CSGHGR NECK,MAXIMUM TORQUE 25000 LBF-FT (\$200.00; \$10.00)			
PN 103066: WASH TOOL,CW,CSGHGR,MBU-LR/MBS(2),FLUTED,11 X 4-1/2 IF (NC50) BOX TOP THDS,FAB (\$400.00; \$20.00)			
PN 102479: RUN TOOL,CW,PACKOFF,MBU-LR-LWR,11 X 4-1/2 IF (NC50) BTM & TOP,W/7.500-4 STUB ACME-2G LH PIN BTM (\$300.00; \$15.00)			
PN 102172: WBUSH,CW,CTH/MBS2-UPR,11 X 7.0 ID X 13.5 LG (\$250.00; \$15.00)			
PN 118739: RUN TOOL,CW,CSGHGR,TP8,6.125-4 STUB ACME-2G RIGHT HAND PIN BTM X 5-1/2 (20#) VAM TOP HT BOX TOP,W/4.696 MIN BORE & MAX LOAD CAPACITY 500K,MAX TORQUE 23000 FT-LBS,SPEC FOR ROTATING CASING STRING,4140 110K (\$550.00; \$30.00)			
PN 103164: WASH TOOL,CW,CSGHGR,MBU-2LR/MBS2-R (3T),FLUTED,11 X 4-1/2 IF (NC50) BOX TOP THDS,FAB (\$250.00; \$15.00)			
PN 115167: RUN TOOL,CW,PACKOFF,CTF-SN,7-5/8,W/8.750-4 STUB ACME-2G LEFT HAND PIN BTM X 4-1/2 IF (NC50) BOX TOP,W/BALL BEARINGS (\$275.00; \$15.00)			
PN 102045: RUN TOOL,PACKOFF,CW,CTF,11 X 4-1/2 IF (NC50),W/5 HBPV MALE THD (\$275.00; \$15.00)			
NOTE: CUSTOMER RESPONSIBLE FOR REPAIRS AND LOST, DAMAGED, OR BEYOND REPAIR TOOLS. RENTAL CHARGES MAY NOT BE APPLIED TO THE PURCHASE PRICE OF EQUIPMENT.			

30	RNM	Rental Charge Minimum	0.00	1,500.00	0.00
11 10M TA CAP RENTAL = \$1,500.00 PER WELL FOR THE FIRST 45 DAYS; \$65.00 PER DAY THEREAFTER.					

RENTAL CONSISTS OF THE FOLLOWING ITEMS:

PN 121517: TA CAP,CW,DBLHPS,7-5/8,11 10M FLG,W/2 LP OUTLET,F/5.75 CUTOFF,5000 PSI MAX WP,6A-PU-EE-NL-1-1

NOTE: CUSTOMER RESPONSIBLE FOR LOST, DAMAGED OR BEYOND REPAIR RENTAL TOOLS. RENTAL CHARGES MAY NOT BE APPLIED TO THE PURCHASE PRICE OF EQUIPMENT.



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		Quantity	Price	Ext Price
				4,075.00
TUBING HEAD ASSEMBLY				
31	123779	1.00	13,374.00	13,374.00
	TBGHD,CW,CTH-DBLHPS-SB,7-5/8,11 10M X 7-1/16 15M,W/2 1-13/16 15M FP,ACME VR THD,5.13 MIN BORE & 17-4PH LDS,34.0 LG,RND BAR,6A-PU-EE-0,5-1-2			
32	104700	4.00	3,015.00	12,060.00
	VLV,DSG-22,1-13/16 15M FE EE-0,5 (6A PU EE-0,5 PSL3 PRI),QPQ TRIM			
33	100203	2.00	550.00	1,100.00
	ADPT,TS,FH,1-13/16 15M X 2 FIG 1502 X 9/16 AUTOCLAVE,NON-NACE (INCLUDES SEAL RING) FH25099462-3			
34	100048	1.00	34.55	34.55
	FTG,GRS,VENTED CAP,1/2 NPT,4140 -50F W/ELECTROLESS NICKEL COATING NACE,K-MONEL BALL,INCONEL X-750 SPRING			
35	BX151	6.00	6.26	37.56
	RING GASKET,BX151,1-13/16 10/15/20M			
36	105477	32.00	3.99	127.68
	STUD,ALL-THD W/2 NUTS,BLK,7/8-9UNC X 6,A193 GR B7/A194 GR 2H,NO PLATING			
37	BX158	1.00	91.35	91.35
	RING GASKET,BX158,11 10/15/20M			
38	780083	16.00	42.00	672.00
	STUD,ALL-THD W/2 NUTS,BLK,1-3/4-8UN X 15-1/4,A193 GR B7/A194 GR 2H.NO PLATING			
39	810023	1.00	422.53	422.53
	NEEDLE VALVE,2 WAY ANGLE.9/16,20KSI,SOUR SERVICE,W/O COLLARS & GLANDS			
40	106012	1.00	93.49	93.49
	ADPT,AUTOCLAVE,HIGH PRESSURE, 9/16 MALE TO 9/16 MALE,316SS			
41	PG15M	1.00	230.04	230.04
	PRESSURE GAUGE,15M,9/16 AUTOCLAVE,LIQUID FILLED			
				28,243.20
CONTINGENCY EQUIPMENT				
EMERGENCY EQUIPMENT; INVOICED AS REQUIRED				
42	102470	0.00	3,325.00	0.00
	CSGHGR,CW,MBU-LR,11 X 7-5/8,6A-PU-DD-3-1			
43	102472	0.00	6,170.00	0.00
	PACKOFF,CW,MBU-LR,EMERG,11 10M X 7-5/8,W/7.500-4 STUB ACME-2G LH BOX TOP,6A-U-AA-1-1			
44	102474	0.00	6,135.00	0.00
	CSGHGR,CW,MBU-LR,UPR,11 X 5-1/2,6A-PU-DD-3-1			
45	115873	0.00	5,550.00	0.00
	PACKOFF,CW,CTF-SN,7-5/8,11 X 5-1/2,EMERG,W/5 HBPV BOX THD & 4.93 MIN BORE,10000 PSI MAX WP,4140 80K,6A-U-DD-NL-2-2 (REF115873)			



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Quantity	Price	Ext Price
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NOTE: MUST USE RX RING GASKET

0.00

INFORMATION CONTAINED HEREIN IS THE PROPERTY OF CACTUS WELLHEAD, LLC. REPRODUCTION, DISCLOSURE, OR USE THEREOF IS PERMISSIBLE ONLY AS PROVIDED BY CONTRACT OR AS EXPRESSLY AUTHORIZED BY CACTUS WELLHEAD, LLC.

For Acceptance of this Quotation
Please Contact Ph: 713-626-8800
sales@cactuswellhead.com

Matl:	70,623.00
Labor:	0.00
Misc:	4,075.00
Sales Tax:	0.00
Total:	74,698.00



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CACTUS WELLHEAD, LLC PURCHASE TERMS AND CONDITIONS

1. **ACCEPTANCE:** Acceptance of Cactus Wellhead, LLC (herein: Company) Purchase Terms and Conditions (herein: CACTUS Purchase Terms) shall be deemed effective upon shipment of the goods and/or rendering of services which are the subject of an order by Customer (defined as the party purchasing CACTUS goods and/or services referred on the invoice). Any proposal made by Customer for additional or different terms and conditions or any attempt by Purchaser to vary in any degree any of the terms and conditions of CACTUS Purchase Terms is hereby rejected. TO THE EXTENT A PART OF A PROVISION EXCLUSIVELY APPLIES TO GOODS OR SERVICES AND THESE TERMS DOES NOT REQUEST OR CONTEMPLATE SUCH, THE PROVISION DOES NOT APPLY.

2. **Pricing.** Each Product and Service shall be invoiced at (and Customer shall pay) the respective price shown on the reverse side hereof, or if no price is shown on the reverse side hereof, at the price shown in the current price list of Company. In addition, Customer shall pay any and all additional charges for mileage, transportation, freight, packing and other related charges, as well as any federal, state or local tax, excise, or charge applicable on the sale, transportation, or use of Products and Services, unless otherwise specified.

3. **Terms of Payment.** Customer agrees to pay Company any and all payments due on or before thirty (30) days from invoice date at the designated address of Company. Amounts unpaid after such thirty (30) day period shall bear interest at the lesser of (i) one and one-half percent (1½%) per month or (ii) the maximum rate allowed by law. Customer shall also pay any and all of Company's attorney's fees and court costs if any amounts hereunder are collected by an attorney or through legal proceedings. Company reserves the right, among other remedies, either to terminate this agreement or to suspend further deliveries upon failure of Customer to make any payment as provided herein.

4. **Limited Warranty.** COMPANY MAKES NO WARRANTY, EXPRESSED OR IMPLIED, AS TO THE MERCHANTABILITY, FITNESS FOR PURPOSE, DESCRIPTION, QUALITY, PRODUCTIVENESS, ACCURACY OR ANY OTHER MATTER WITH RESPECT TO PRODUCTS OR SERVICES, ALL SUCH WARRANTIES BEING HEREBY SPECIFICALLY AND EXPRESSLY DISCLAIMED BY COMPANY. COMPANY MAY OFFER TECHNICAL ADVICE OR ASSISTANCE WITH REGARD TO THE PRODUCTS AND SERVICES BASED ON LABORATORY AND/OR FIELD EXPERIENCE AND CUSTOMER UNDERSTANDS AND AGREES THAT SUCH ADVICE REPRESENTS ONLY GOOD FAITH OPINIONS AND DOES NOT CONSTITUTE A WARRANTY OR GUARANTEE. THE SOLE AND EXPRESS WARRANTY PROVIDED BY COMPANY IS TO WARRANT THAT THE PRODUCTS SOLD AS LISTED ON THE REVERSE SIDE HEREOF COMPLIES WITH COMPANY'S SOLE SPECIFICATION AT THE DATE AND TIME OF MANUFACTURE. COMPANY MAKES NO WARRANTY THAT SUCH PRODUCTS SHALL MEET SUCH SPECIFICATION AT ANY TIME AFTER SHIPMENT OF PRODUCTS. USE OF SUCH PRODUCTS IS SPECIFICALLY NOT WARRANTED.

5. **Remedy.** The exclusive remedy for this warranty for products shall be limited to, in Company's sole discretion and judgment, the replacement of defective part(s), F.O.B. Company's plant (transportation, redesign, dismantling, disposal of material and installation are not included and shall be borne and paid for by Customer), or repair of defective part(s). The exclusive remedy for this warranty for service shall be limited to, in Company's sole discretion and judgment, the repeat of services performed. F.O.B. Company's plant (transportation, redesign, dismantling, disposal of material and installation are not included and shall be borne and paid for by Customer). Any such repeat of services or replacement or repair of goods shall not include any materials not sold by Company hereunder, and specifically excludes any obligation by Company related to other property of the Customer or any property of third parties. Provided, however, Company may in its sole discretion, decide to instead give Customer credit memorandum for the amounts already paid by Customer to Company for such product or service. IN ANY EVENT AND NOTWITHSTANDING THE LANGUAGE TO THE CONTRARY HEREIN, CUSTOMER ACKNOWLEDGES THAT ANY CLAIM IT MAY HAVE ARISING OUT OF OR IN CONNECTION WITH ANY ORIGINAL PRODUCTS AND SERVICES, ANY REPLACEMENT PRODUCTS OR REPEAT OF SERVICES AND THESE TERMS AND CONDITIONS SHALL BE LIMITED TO AND NOT EXCEED THE AMOUNT CUSTOMER HAS ACTUALLY PAID TO COMPANY FOR SUCH PRODUCTS AND/OR SERVICES PURSUANT HERETO. If Customer fails to make any such claim within thirty (30) days after completion of Service or delivery of Product, Customer hereby waives (to the extent permitted by applicable law) any and all claims it may or does have with respect to such Products and Services. Unless Customer is an authorized reseller of Company, Company's liability in connection with Products and Services shall extend only to Customer. CUSTOMER HEREBY INDEMNIFIES AND HOLDS COMPANY (AND ITS AGENTS, REPRESENTATIVES, OFFICERS DIRECTORS AND EMPLOYEES) HARMLESS FOR ANY LOSS, EXPENSE OR DAMAGE (WHETHER OF CUSTOMER OR OF ANY THIRD PARTY) ARISING FROM OR IN CONNECTION WITH PRODUCTS AND SERVICES, INCLUDING WITHOUT LIMITATION ANY FAILURE OF SUCH PRODUCTS AND SERVICES TO CONFORM TO CUSTOMER'S ORDER OR SPECIFICATION OR ANY OTHER STANDARD, OR ANY NEGLIGENCE OR BREACH OF WARRANTY BY COMPANY WITH RESPECT TO ANYTHING DONE OR FAILED TO HAVE BEEN DONE BY COMPANY, IF AND TO THE EXTENT THAT SUCH LOSS, EXPENSE OR DAMAGE EXCEEDS THE AMOUNT CUSTOMER HAS ACTUALLY PAID COMPANY PURSUANT HERETO FOR SUCH PRODUCTS OR SERVICES.

6. **Inspection.** The results of any inspection or testing reported by the Company to Customer represents only good faith opinions and are not to be construed as warranties or guarantees of the quality, classification, merchantability, fitness for purpose, condition, or liability of any equipment or material that has been inspected or tested by the Company.

7. **Insurance.** Each party agrees to maintain comprehensive general liability insurance in the amount of \$1,000,000 each occurrence, \$2,000,000 general aggregate, and Workers Compensation insurance per statutory requirements providing coverage for the indemnity obligations in this agreement. The Company (and such of its affiliates as it shall designate) including their officers, directors, members, shareholders, partners, joint ventures, employees, agents and representatives shall be named as additional insureds under the policies of Customer on a primary basis to the extent of its indemnification obligations set forth in these Terms and Conditions, and the policies shall also provide a waiver of subrogation rights in favor of the Company (and such of its affiliates as it shall designate) and their officers, directors, members, shareholders, employees, agents and representatives. The provisions of this Section 6 shall apply and the obligation to maintain insurance of each party in the coverages and amounts set forth herein shall remain in force regardless and independent of the validity or enforceability of the Indemnity provisions of Section 7, below; the obligation to obtain insurance is a separate and independent obligation. If the insurance required herein is more or less than allowed by prevailing law, the indemnity obligations in Section 7 below shall be effective only to the maximum extent permitted under applicable law.

8. **Indemnification.** The following indemnifications and releases of liability will apply to any goods or Services provided under this contract. COMPANY AND CUSTOMER EXPRESSLY AGREE THAT, TO THE EXTENT REQUIRED BY APPLICABLE LAW TO BE EFFECTIVE, THE INDEMNITIES AND DISCLAIMERS OF WARRANTIES CONTAINED HEREIN ARE "CONSPICUOUS."

A. **Customer Indemnity Obligations.** Customer hereby releases Company from any liability for, and shall protect, defend, indemnify, and hold harmless Company, its parents, affiliates, subsidiaries, partners, joint owners, joint venturers, and its contractors and subcontractors of any tier, and the officers, directors, agents, representatives, employees, insurers, and consultants (specifically excluding any member of Customer Group) of all of the foregoing, and its and their respective successors, heirs and assigns ("Company Group") from and against all costs (including the payment of reasonable attorneys' fees), losses, liabilities, demands, causes of action, damages, or claims of every type and character ("Claims"), arising out of or resulting from or related, directly or indirectly, to (i) injury to, illness or death of Customer its parents, affiliates, subsidiaries, partners, joint owners, joint venturers, and its contractors and subcontractors of any tier, and the officers, directors, agents, representatives, employees, customers, insurers, invitees and consultants of all of the foregoing, and its and their respective successors, heirs and assigns ("Customer Group"), or (ii) loss of or damage to any property of any member of Customer Group. REGARDLESS OF THE CAUSE OF SUCH CLAIMS, INCLUDING THE NEGLIGENCE (WHETHER SOLE, JOINT OR CONCURRENT, ACTIVE OR PASSIVE, ORDINARY OR GROSS) STRICT LIABILITY, OR ANY OTHER LEGAL FAULT OR RESPONSIBILITY OF ANY MEMBER OF COMPANY GROUP.

B. **Company Indemnity Obligations.** Company hereby releases Customer from any liability for, and shall protect, defend, indemnify, and hold harmless Customer from and against all Claims arising out of or resulting from or related, directly or indirectly, to (i) injury to, illness or death of any member of Company Group, or (ii) loss of or damage to any property of any member of Company Group. REGARDLESS OF THE CAUSE OF SUCH CLAIMS, INCLUDING THE NEGLIGENCE (WHETHER SOLE, JOINT OR CONCURRENT, ACTIVE OR PASSIVE, ORDINARY OR GROSS) STRICT LIABILITY, OR ANY OTHER LEGAL FAULT OR RESPONSIBILITY OF ANY MEMBER OF CUSTOMER GROUP.

C. **Third Party Claims.** Notwithstanding the foregoing, to the extent of its negligence, Company and Customer shall each indemnify, defend and hold harmless Claims, of every type and character, which are asserted by third parties for bodily injury, death or loss or destruction of property or interests in property in any manner caused by, directly or indirectly resulting from, incident to, connected with or arising out of the work to be performed, Services to be rendered or materials to be furnished by Customer. When personal injury, death or loss of or damage to property is the result of joint or concurrent negligence of Customer or Company, the indemnitor's duty of indemnification shall be in proportion to its allocable share of such negligence.

D. **Pollution.** Company agrees that it shall be totally responsible for, and shall protect, defend and indemnify, Customer for all losses, damages, claims, demands, costs, charges, and other expenses, including attorneys' fees, for any and all waste and/or hazardous substances which are in Company Group's exclusive possession and control and directly associated with Company Group's equipment and facilities. EVEN IF THE LOSSES, DAMAGES, CLAIMS, DEMANDS, COSTS, FEES, AND EXPENSES ARE CAUSED BY OR CONTRIBUTED TO BY THE NEGLIGENCE OF CUSTOMER GROUP. Customer shall assume all responsibility for, including control and removal of, and shall protect, defend and indemnify Company Group from and against all Claims arising directly or indirectly from all other pollution or contamination which may occur during the conduct of operations hereunder, including, but not limited to, that which may result from fire, blowout, cratering, seepage or any other uncontrolled flow of oil, gas, water or other substance, EVEN IF THE LOSSES, DAMAGES, CLAIMS, DEMANDS, COSTS, FEES, AND EXPENSES ARE CAUSED BY OR CONTRIBUTED TO BY THE NEGLIGENCE OF COMPANY GROUP.

E. **Wild Well.** Customer shall release Company Group of any liability for, and shall protect, defend and indemnify Company Group for any damages, expenses, losses, fines, penalties, costs, expert fees and attorneys' fees arising out of a fire, blow out, cratering, seepage or wild well, including regaining control thereof, debris removal and property restoration and remediation. THIS INDEMNITY APPLIES EVEN IF THE LOSSES, DAMAGES, CLAIMS, DEMANDS, COSTS, FEES, AND EXPENSES ARE CAUSED NEGLIGENCE (WHETHER SOLE, JOINT OR CONCURRENT, ACTIVE OR PASSIVE, ORDINARY OR GROSS) STRICT LIABILITY, OR ANY OTHER LEGAL FAULT OR RESPONSIBILITY OF ANY MEMBER OF COMPANY GROUP.

F. **Underground Damage.** Customer shall release Company Group of any liability for, and shall protect, defend and indemnify Company Group from and against any and all claims, liability and expenses resulting from operations related to the work under this agreement on account of injury to, destruction of, or loss or impairment of any property right in or to oil, gas or other mineral substance or water, if at the time of the act or omission causing such injury, destruction, loss or impairment said substance and not been reduced to physical possession above the surface of the earth, and for any loss or damage to any formation, strata, or reservoir beneath the surface of the earth. THIS INDEMNITY APPLIES EVEN IF THE LOSSES, DAMAGES, CLAIMS, DEMANDS, COSTS, FEES, AND EXPENSES ARE CAUSED NEGLIGENCE (WHETHER SOLE, JOINT OR CONCURRENT, ACTIVE OR PASSIVE, ORDINARY OR GROSS) STRICT LIABILITY, OR ANY OTHER LEGAL FAULT OR RESPONSIBILITY OF ANY MEMBER OF COMPANY GROUP.

G. **Compliance With Laws, Rules And Regulations.** Customer expressly agrees to comply with and abide by all of the laws of the United States and of the state in which goods are delivered or services are performed, including, but not limited to, OSHA, EPA and all rules and regulations now existing or that may be hereafter promulgated under and in accordance with any such law or laws, and Customer hereby agrees to indemnify and hold Company Group harmless from any and all claims, demands, or damages incurred by Company Group arising from Customer Group's failure to comply with all laws and governmental regulations.

H. The foregoing indemnities set forth in these Terms and Conditions are intended to be enforceable against the parties hereto in accordance with the express terms and scope hereof notwithstanding Texas' Express Negligence Rule or any similar directive that would prohibit or otherwise limit indemnities because of the negligence (whether sole, concurrent, active or passive, ordinary or gross) or other fault or strict liability of Company or Customer.

I. If a claim is asserted against one of the parties to this agreement which may give rise to a claim for indemnity against the other party hereto, the party against whom the claim is first asserted must notify the potential indemnitor in writing and give the potential indemnitor the right to defend or assist in the defense of the claim.

J. **Risk Of Loss.** a. Title and risk of loss shall pass to Customer upon delivery as specified in Article 9. Customer's receipt of any material delivered hereunder shall be an unqualified acceptance of, and a waiver by Customer of any and all claims with respect to, such material unless Customer gives Company written notice of claim within thirty (30) days after such receipt. Notwithstanding the foregoing, installation or use of materials or equipment shall unequivocally constitute irrevocable acceptance of said materials. Customer assumes all risk and liability for the results obtained by the use of any material or products delivered



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hereunder in work performed by on behalf of Customer or in combination with other substances or products. No claim of any kind, whether as to material delivered or for non-delivery of material, and whether or not based on negligence, shall be greater in amount than the purchase price of the material in respect of which such claim is made. In no event shall Company be liable for special, indirect or consequential damages, whether or not caused by or resulting from the negligence of Company. b. For services, Company shall not be liable for loss or deterioration of any equipment and material of Customer under Company's control or stored on Company's premises after Company has completed its work if such loss or deterioration results from atmospheric condition, Act of God or other occurrence not within the reasonable control of Company.

8. **Termination.** Company reserves the right to terminate the order at issue, or any part hereof, solely for its convenience at any time without cause with notice to Customer. Company shall have the right to cancel any unfilled order without notice to Customer in the event that Customer becomes insolvent, adjudicated bankrupt, petitions for or consents to any relief under any bankruptcy reorganization statute, violates a term of these Terms and Conditions, or is unable to meet its financial obligations in the normal course of business. In the event of such termination, Company shall immediately stop all work hereunder. Prior to delivery, Customer may terminate this order without cause upon thirty (30) day notice in writing to Company. In the event of such termination, Company at its sole option shall cease work up to thirty (30) days after such notice. Upon the cessation of work, Customer agrees to pay Company a reasonable termination charge consisting of a percentage of the Invoice price, such percentage to reflect the value of the goods, services or work in progress completed upon the cessation of work. Customer shall also pay promptly to Company any costs incurred due to paying and settling claims of Company's vendors or subcontractors arising out of the termination of the order by Customer.

9. **Delivery.** Unless different terms are provided on the face of this order, all items are sold FOB Company's manufacturing facility in Bossier City, LA., and Customer shall bear the cost of transportation to any other named destination. Upon notification of Company of delivery, Customer shall become liable and shall bear all risk of loss associated with the goods at issues regardless of whether the goods are at a location controlled by Company and whether or not caused by the negligence of Company. In the case of Customer pick-up, the truck furnished by Customer is the destination and Company's obligations regarding shipments are fulfilled when the goods are loaded on the truck. Items to be shipped to any other destination outside of the United States are sold FOB port of shipment (Customer will deliver and bear the cost of transportation to the named port and will bear the cost of transportation thereafter to the final destination). The means of shipment and carrier to the point at which Company's liability for transportation costs ceases shall be chosen by Company. Excess packing, marking, shipping, and transportation charges resulting from compliance with Customer's request shall be for Customer's account. Unless otherwise agreed in writing, delivery time is not of the essence.

10. **Returns/Refund.** Within ninety (90) days of delivery, Customer has the option to return any non-defective goods (any goods found to be defective will be subject to the warranty and remedies expressed in paragraphs three (3) and four (4) above). Customer shall bear all costs of shipment and/or transportation for such return and risk of loss for the returned goods shall remain with Customer until re-delivered to Company's Yard. Customer shall receive a full refund for any returns, less a twenty percent (20%) restocking fee. Company at all times reserves the right to designate certain goods as non-refundable in Company's Sales Quote or Sales Order. In addition, any made-to-order, special order, and/or product manufactured to Customer specifications goods are NOT returnable.

11. **Delays.** If a specific shipping date is either not given or is estimated only, and is not promised on the face of this order or in a separate writing signed by Company, Company will not be responsible for delays in filling this order nor liable for any loss or damages resulting from such delays. If a specific shipping date is promised, Company will not be liable for delays resulting from causes beyond Company's control, including without limitation accidents to machinery, fire, flood, act of God or other casualty, vendor delays, labor disputes, labor shortages, lack of transportation facilities, priorities required by, requested by, or granted for the benefit of any governmental agency, or restrictions imposed by law or governmental regulation.

12. **Limitation Of Damages.** Notwithstanding any other provision contained herein, Company shall not be liable to Customer Group of any third party for consequential (whether direct or indirect damages), indirect, incidental, special or punitive damages, howsoever arising, including, but not limited to loss of profits (whether direct or indirect damages), revenues, production or business opportunities, WHETHER OR NOT SUCH LOSSES ARE THE RESULT IN WHOLE OR IN PART FROM THE NEGLIGENCE (WHETHER SOLE, JOINT, CONCURRENT OR COMPARATIVE, ACTIVE OR PASSIVE, ORDINARY OR GROSS) OF COMPANY GROUP, OR ANY DEFECT IN THE PREMISES, PRE-EXISTING CONDITIONS, PATENT OR LATENT, BREACH OF STATUTORY DUTY, STRICT LIABILITY OR ANY OTHER THEORY OF LEGAL LIABILITY OF COMPANY GROUP (EXCLUDING ONLY LOSSES CAUSED BY THE WILLFUL MISCONDUCT OF COMPANY GROUP).

13. **Security Interest.** Customer grants Company, and Company reserves, a security interest, covering all Customer's obligations under these terms (including any liability for breach of Customer's obligations), and applying to all of Customer's right, title, and interest in the Leased Equipment, together with all accessions thereto and any proceeds that may arise in connection with the sale or disposition thereof. Customer shall cooperate with Company in the filing of Financing Statements to perfect such security interest. Furthermore, Customer authorizes Company to execute and file Financing Statements without Customer's signature in any jurisdiction in which such procedure is authorized. Customer warrants, covenants and agrees that it will not, without prior written consent of Company, sell, contract to sell, lease, encumber, or dispose of the Leased Equipment or any interest in it until all obligations secured by this security interest have been fully satisfied.

14. **Patent And Intellectual Property.** Company Retains its Intellectual Property: The sale of any products hereunder does not convey any license by implication, estoppel or otherwise covering combinations of the products with other equipment data or programs. Company retains the copyright in all documents, catalogs and plans supplied to Customer pursuant to or ancillary to the contract. Unless otherwise agreed in writing, Customer shall obtain no interest in any tooling used in the production of any Company product.

15. **Taxes.** Unless otherwise specifically provided for herein, Customer shall be liable for all federal, state, or local taxes or import duties assessed by any governmental entity of any jurisdiction in connection with the goods or services furnished hereunder.

16. **Deceptive Trade Practices.** Customer acknowledges the application of Section 17.45(4) of the Texas Deceptive Trade Practices Act (Texas Business Commission Code §17.41 et. seq.) (the "Act") to any transaction contemplated hereby and represents that it is not a "consumer" for the purposes of the Act.

17. **No Waiver.** Failure to enforce any or all of the provisions in these Terms and Conditions in any particular instance shall not constitute or be deemed to constitute a waiver of or preclude subsequent enforcement of the same provision or any other provision of these Terms and Conditions. Should any provision of these Terms and Conditions be declared invalid or unenforceable all other provisions of these Terms and Conditions shall remain in full force and effect.

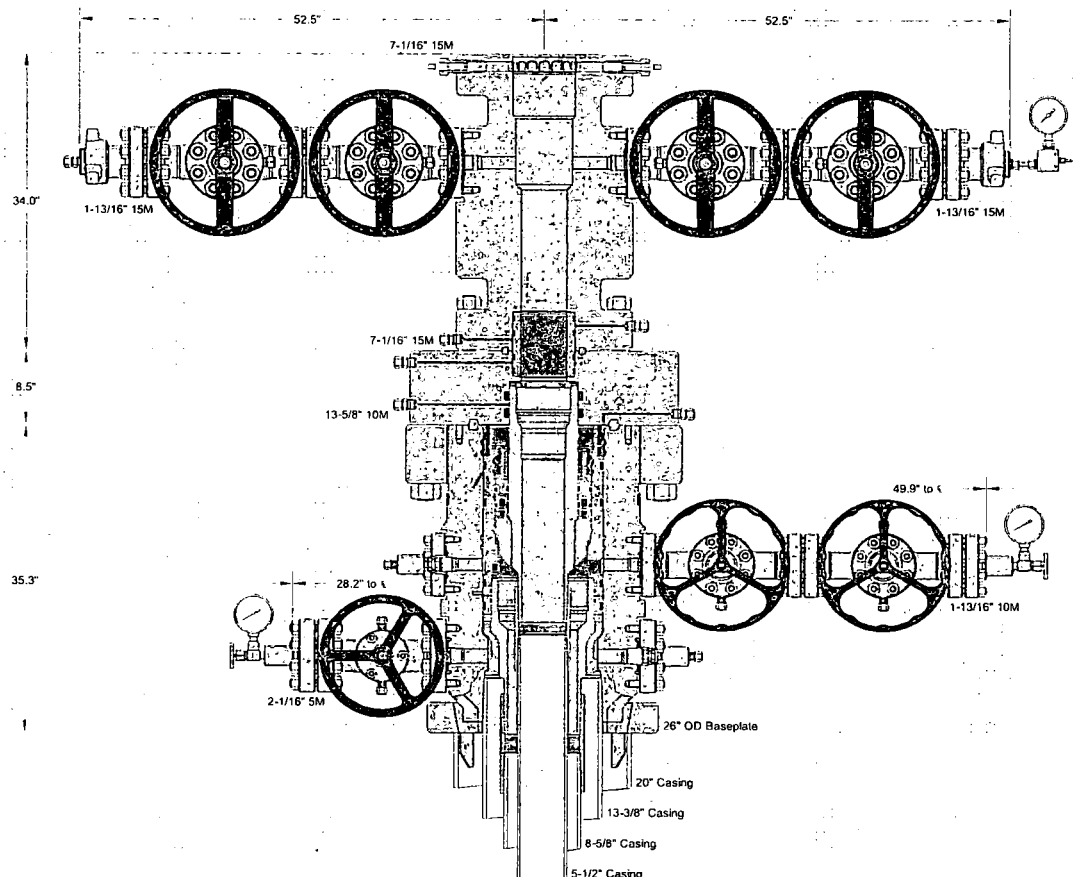
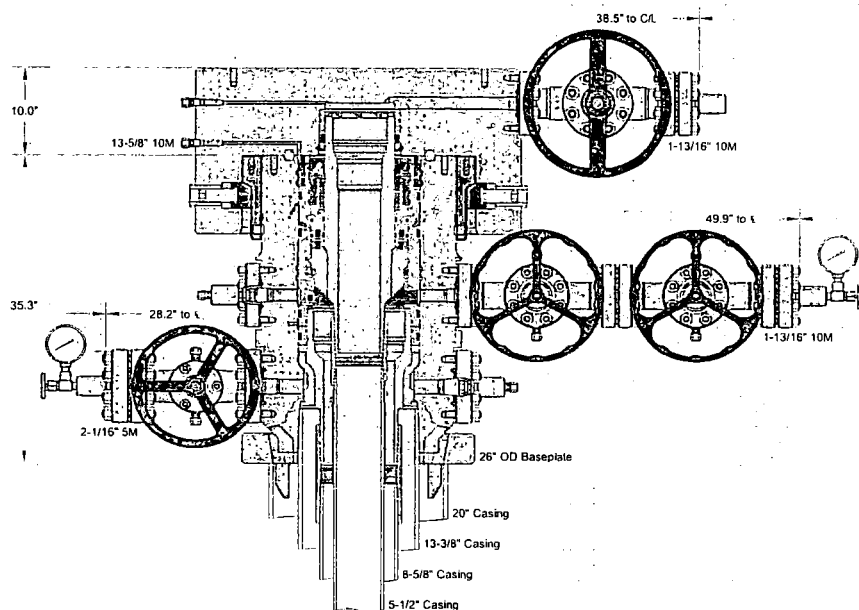
18. **Choice Of Law.** THIS AGREEMENT SHALL BE GOVERNED BY AND CONSTRUED IN ACCORDANCE WITH THE LAWS OF THE STATE OF TEXAS AND SHALL BE PERFORMABLE IN HARRIS COUNTY, TEXAS. WITHOUT REGARD TO CONFLICTS OF LAW PRINCIPALS AND WAIVER OF SAME, EACH PARTY HERETO SUBMITS TO THE JURISDICTION OF THE COURTS OF THE STATE OF TEXAS IN HARRIS COUNTY, TEXAS AND THE FEDERAL COURTS IN AND FOR THE SOUTHERN DISTRICT OF TEXAS SITTING IN HOUSTON, TEXAS IN CONNECTION WITH ANY DISPUTE ARISING UNDER THIS AGREEMENT OR ANY DOCUMENT OR INSTRUMENT ENTERED INTO IN CONNECTION HERewith.

19. **Authority.** Customer warrants and represents that the individual receiving this order at issue on behalf of Customer has the authority to enter into these Terms and Conditions on behalf of Customer, and that upon receipt these Terms and Conditions shall be binding upon Customer.

20. **Force Majeure.** If Company is unable to carry out its obligations hereunder by reason of force majeure, then upon Company's giving of notice and reasonably full particulars of such force majeure in writing to Customer, Company's obligations that are affected by force majeure shall be suspended during the continuance of the force majeure and Company shall not be liable to Customer for any damages incurred by the Customer as a result thereof.

21. **Confidentiality.** Customer acknowledges the highly secret and valuable nature of all proprietary inventions, methods, processes, designs, know-how, and trade secrets embodied in the Company's equipment, products and services and its components (hereinafter referred to as "Confidential Data"). Accordingly, Customer agrees not to disclose or use any Confidential Data. Customer further agrees to take any and all necessary precautions to prevent disclosure of the Confidential Data associated with the Company's equipment, products and services and components thereof to persons other than those employees of Customer for whom such disclosure is necessary for performance of the work hereunder.

22. **Compliance.** Customer expressly agrees to comply with and abide by, all of the laws of the United States and of the State of Texas, including, but not limited to, OSHA, EPA and all rules and regulations now existing or that may be hereafter promulgated under and in accordance with any such law or laws, and hereby agrees to indemnify and hold Company harmless from any and all claims, demands, or damages incurred by Company arising from Customer's failure to comply with all laws and governmental regulations. The indemnities in this paragraph shall be in addition to any other indemnity obligations between Customer and Company, including any other indemnity obligations contained herein.



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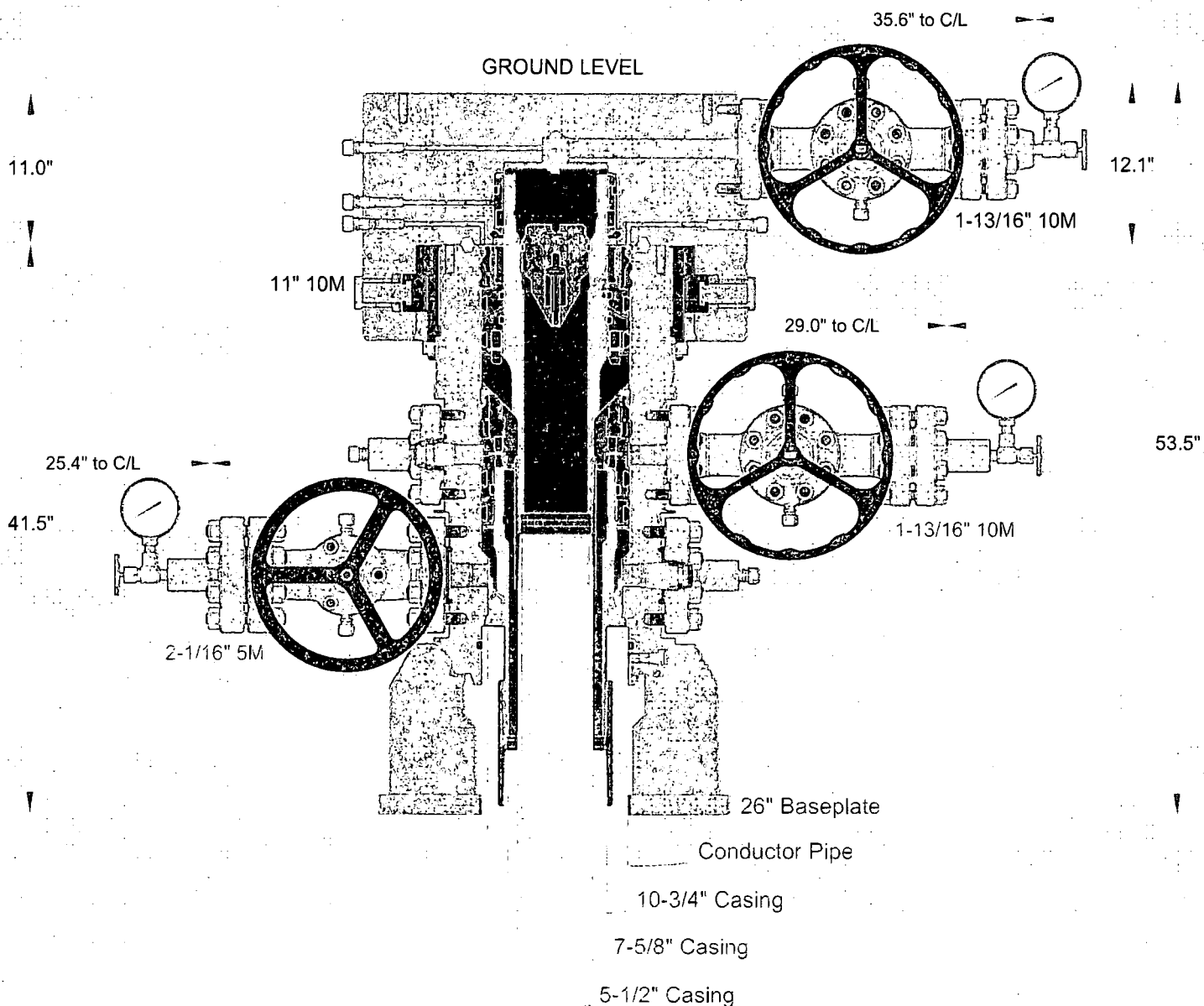
ALL DIMENSIONS APPROXIMATE

CACTUS WELLHEAD LLC

DEVON ENERGY CORPORATION
DELAWARE BASIN

13-3/8" x 8-5/8" x 5-1/2" 10M MBU-3T Wellhead System
With 8-5/8" And 5-1/2" Mandrel Casing Hangers
And 7-1/16" 15M x 7-1/16" 15M CTH-EN Tubing Head

DRAWN	DLE	01NOV18
APPROV		
DRAWING NO.	HBE0000013	



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CACTUS WELLHEAD LLC

DEVON ENERGY CORPORATION

16" x 11-7/8" x 7-5/8" MBU-T Wellhead Assembly
With 7-5/8" & 5-1/2" Pin Bottom Mandrel Casing Hangers
And 11" 10M MBU-T-HPS-F TA Cap

DRAWN	DLE	29NOV17
APPRV		
DRAWING NO.		OKE0001764

A multibowl wellhead may be 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.

Devon proposes using a multi-bowl wellhead assembly. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be 5000 (5M) psi.

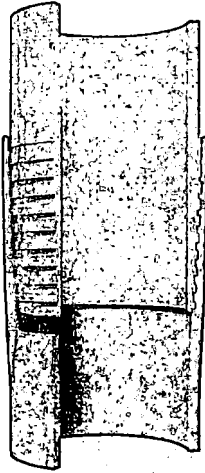
- Wellhead will be installed by wellhead representatives.
- If the welding is performed by a third party, the wellhead representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
- Wellhead representative will install the test plug for the initial BOP test.
- Wellhead company will install a solid steel body pack-off to completely isolate the lower head after cementing intermediate casing. After installation of the pack-off, the pack-off and the lower flange will be tested to 5M, as shown on the attached schematic. Everything above the pack-off will not have been altered whatsoever from the initial nipple up. Therefore the BOP components will not be retested at that time.
- If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head will be cut and top out operations will be conducted.
- Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating.
- Devon will test the casing to 0.22 psi/ft or 1500 psi, whichever is greater, as per Onshore Order #2.

After running the surface casing, a BOP/BOPE system with a minimum rating of 5M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 5,000 psi high pressure test. The 5,000 psi high and 250 psi low test will cover testing requirements a maximum of 30 days, as per Onshore Order #2. If the well is not complete within 30 days of this BOP test, another full BOP test will be conducted, as per Onshore Order #2.

After running the intermediate casing with a mandrel hanger, the BOP/BOPE system with a minimum rating of 10M will be installed on the wellhead.

The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at 10,000 psi WP.

Devon's proposed wellhead manufactures will be FMC Technologies, Cactus Wellhead, or Cameron.



TEC-LOCK WEDGE

8.625" 32.00 LB/FT (.352" Wall)

BORUSAN MANNESMANN P110 HSCY

Pipe Body Data

Nominal OD:	8.625	in
Nominal Wall:	.352	in
Nominal Weight:	32.00	lb/ft
Plain End Weight:	31.13	lb/ft
Material Grade:	P110 HSCY	
Mill/Specification:	BORUSAN MANNESMANN	
Yield Strength:	125,000	psi
Tensile Strength:	125,000	psi
Nominal ID:	7.921	in
API Drift Diameter:	7.796	in
Special Drift Diameter:	7.875	in
RBW:	87.5 %	
Body Yield:	1,144,000	lbf
Burst:	8,930	psi
Collapse:	4,230	psi

Connection Data

Standard OD:	9.000	in
Pin Bored ID:	7.921	in
Critical Section Area:	8.61433	in ²
Tensile Efficiency:	94.2 %	
Compressive Efficiency:	100.0 %	
Longitudinal Yield Strength:	1,077,000	lbf
Compressive Limit:	1,144,000	lbf
Internal Pressure Rating:	8,930	psi
External Pressure Rating:	4,230	psi
Maximum Bend:	62.6	°/100

Operational Data

Minimum Makeup Torque:	29,900	ft*lbf
Optimum Makeup Torque:	37,375	ft*lbf
Maximum Makeup Torque:	80,900	ft*lbf
Minimum Yield:	89,900	ft*lbf
Makeup Loss:	5.97	in

Notes

Operational Torque is equivalent to the Maximum Make-Up Torque.

