

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

HOBBS OCD
JUL 19 2019
RECEIVED

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM062223
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: ☐ Hydraulic Fracturing ☒ Single Zone ☐ Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator DEVON ENERGY PRODUCTION COMPANY LP (6137)		8. Lease Name and Well No. ALLEY CAT 17-20 FED COM 526H (322236)
3a. Address 333 West Sheridan Avenue Oklahoma City OK 73102	3b. Phone No. (include area code) (800)583-3866	9. API Well No. 70-025
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface SESE / 302 FSL / 1206 FEL / LAT 32.3126543 / LONG -103.6920706 At proposed prod. zone SESE / 20 FSL / 400 FEL / LAT 32.2828573 / LONG -103.6894492		10. Field and Pool, or Exploratory SAND DUNES / BONE SPRING 53800
11. Sec., T, R, M. or Blk. and Survey or Area SEC 8 / T23S / R32E / NMP		12. County or Parish LEA
13. State NM		
14. Distance in miles and direction from nearest town or post office*		
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 302 feet	16. No of acres in lease 617.92	17. Spacing Unit dedicated to this well 640
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 280 feet	19. Proposed Depth 9455 feet / 20055 feet	20. BLM/BIA Bond No. in file FED: CO1104
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3610 feet	22. Approximate date work will start* 04/28/2019	23. Estimated duration 45 days
24. Attachments		

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

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

25. Signature (Electronic Submission)	Name (Printed/Typed) Jenny Harms / Ph: (405)552-6560	Date 12/14/2018
Title Regulatory Compliance Professional		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 07/17/2019
Title Assistant Field Manager Lands & Minerals		
Office CARLSBAD		

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

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

GCP Rec 07/19/19

APPROVED WITH CONDITIONS

KZ
07/19/19
Double Sided

INSTRUCTIONS

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

ITEM 1: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

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

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

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

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

The BLM connects this information to an evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

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

Additional Operator Remarks

Location of Well

1. SHL: SESE / 302 FSL / 1206 FEL / TWSP: 23S / RANGE: 32E / SECTION: 8 / LAT: 32.3126543 / LONG: -103.6920706 (TVD: 0 feet, MD: 0 feet)
PPP: NENE / 100 FNL / 400 FEL / TWSP: 23S / RANGE: 32E / SECTION: 17 / LAT: 32.311536 / LONG: -103.689453 (TVD: 9410 feet, MD: 9615 feet)
PPP: NESE / 2640 FSL / 400 FEL / TWSP: 23S / RANGE: 32E / SECTION: 17 / LAT: 32.304554 / LONG: -103.689459 (TVD: 9455 feet, MD: 12162 feet)
BHL: SESE / 20 FSL / 400 FEL / TWSP: 23S / RANGE: 32E / SECTION: 20 / LAT: 32.2828573 / LONG: -103.6894492 (TVD: 9455 feet, MD: 20055 feet)

BLM Point of Contact

Name: Ciji Methola

Title: GIS Support - Adjudicator

Phone: 5752345924

Email: cmethola@blm.gov

CONFIDENTIAL

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

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PECOS DISTRICT

DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Devon Energy Production Company LP
LEASE NO.:	NMNM062223
WELL NAME & NO.:	Alley Cat 17-20 Fed Com 526H
SURFACE HOLE FOOTAGE:	302'/S & 1206'/E
BOTTOM HOLE FOOTAGE:	20'/S & 400'/E
LOCATION:	Section 8, T.23 S., R.32 E., NMPM
COUNTY:	Lea County, New Mexico

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

A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **Sand Dunes, Triste Draw, Wildcat, and Bone Springs** formation. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

1. The 13-3/8 inch surface casing shall be set at approximately **1110 feet** (a minimum of **25 feet (Lea County)** 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 9-5/8 inch intermediate casing shall be set at approximately **4673 feet** is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above.
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.
Cement excess is less than 25%, more cement might be required.
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.

C. 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 **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 **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.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees

of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.

- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

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.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

**PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	Devon Energy Production Company LP
WELL NAME & NO.:	Alley Cat 17-20 Fed Com 526H
SURFACE HOLE FOOTAGE:	302'/S & 1206'/E
BOTTOM HOLE FOOTAGE	20'/S & 400'/E
LOCATION:	Section 8, T.23 S., R.32 E., NMPM
COUNTY:	Lea County, New Mexico

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

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
 - Lesser Prairie-Chicken Timing Stipulations
 - Ground-level Abandoned Well Marker
 - VRM
 - Range
 - Watershed & Surface/Groundwater Quality
 - Tank Battery
- ☐ **Construction**
 - Notification
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- ☐ **Road Section Diagram**
- ☐ **Production (Post Drilling)**
 - Well Structures & Facilities
 - Pipelines
 - Electric Lines
- ☐ **Interim Reclamation**
- ☐ **Final Abandonment & Reclamation**

I. GENERAL PROVISIONS

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

II. PERMIT EXPIRATION

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

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

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

IV. NOXIOUS WEEDS

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

V. SPECIAL REQUIREMENT(S)

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken:

Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006. The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all power line structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. The holder without liability or expense shall make such modifications and/or additions to the United States.

Raptor Nest Mitigation

- A BLM Wildlife Biologist must be contacted by the operator prior to construction activities to determine if the raptor nests/burrows are active.
- Raptor nests on special, natural habitat features, such as trees, large brush, cliff faces and escarpments, will be protected by not allowing surface disturbance within up to 200 meters of nests or by delaying activity for up to 90 days, or a combination of both. Exceptions to this requirement for raptor nests will be

considered if the nests expected to be disturbed are inactive, the proposed activity is of short duration (e.g. habitat enhancement projects, fences, pipelines), and will not result in continuing activity in proximity to the nest.

- Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

Watershed

- The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The berm shall be maintained through the life of the well and after interim reclamation has been completed.
- Any water erosion that may occur due to the construction of the well pad and CTB pad during the life of the well and CTB will be corrected within two weeks and proper measures will be taken to prevent future erosion.
- Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.
- Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.
- Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control.

Range

Temporary Fence Crossing Requirement

Where entry is granted across a fence line, the fence must be braced and tied off on both sides of the passageway with H-braces prior to cutting. Once the work is completed, the fence will be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Livestock Watering Requirement

Devon, in an agreement with the grazing allotment holder, would relocate a water pipeline and trough affected by several proposed actions. See Table 12 above.

Devon must contact the allotment holder prior to construction to identify the location of the pipelines. Devon must take measures to protect the pipelines from compression or other damages. If the pipelines are damaged or compromised in any way near the proposed project as a result of oil and gas activity, Devon is responsible for repairing the pipelines immediately. Devon must notify the BLM office (575-234-5972) and the private surface landowner or the grazing allotment holder if any damage occurs to structures that provide water to livestock.

During construction, Devon shall minimize disturbance to existing fences, water lines, troughs, windmills, and other improvements on public lands. Devon is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the grazing permittee/allottee prior to disturbing any range improvement projects. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

Temporary Fencing Requirement

For the proposed Todd Apache 2 Pad 7-1, the BLM would require temporary fencing be installed before construction begins. This fencing would stay in place and be maintained throughout construction activities to protect nearby dune land habitat from harm.

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing

The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS**Road Width**

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

Surfacing

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

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

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

Crowning

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

Ditching

Ditching shall be required on both sides of the road.

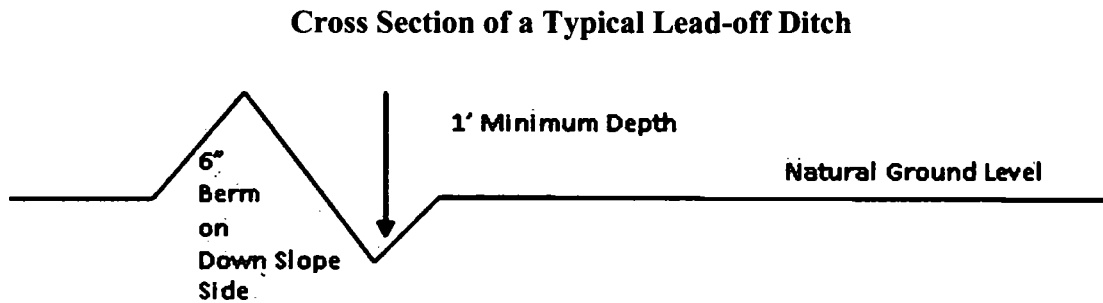
Turnouts

Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

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

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



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

Formula for Spacing Interval of Lead-off Ditches

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

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

Cattle guards

An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access

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

Construction Steps

1. Salvage topsoil
2. Construct road

3. Redistribute topsoil
4. Revegetate slopes

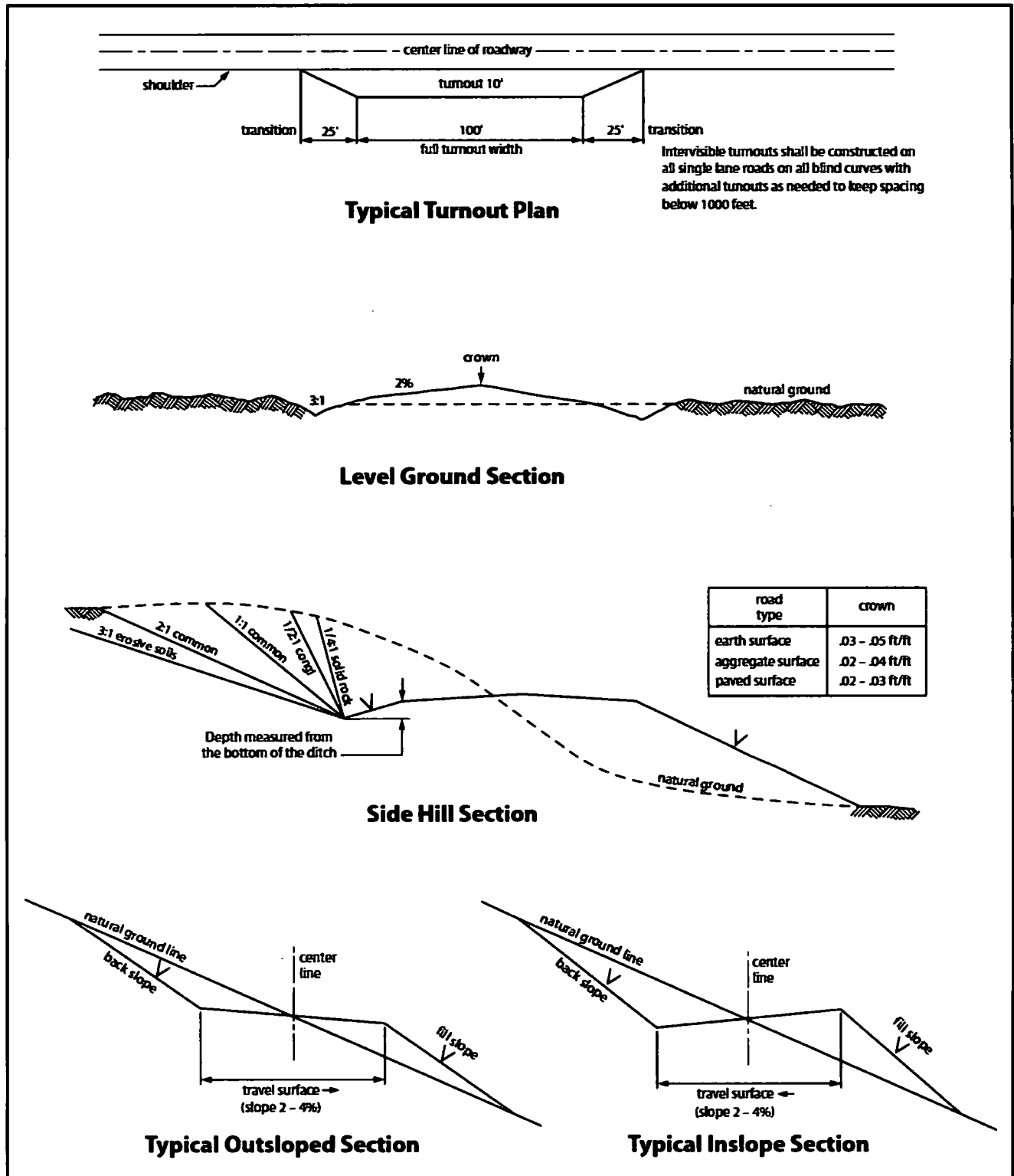


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities

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

Exclosure Netting (Open-top Tanks)

Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening

The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures

The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement

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

VRM Facility Requirement

There are no mitigation measures for this project as currently proposed.

B. PIPELINES

BURIED PIPELINE STIPULATIONS

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way.

This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.
6. The pipeline will be buried with a minimum cover of 36 inches between the top of the pipe and ground level.
7. The maximum allowable disturbance for construction in this right-of-way will be 30 feet:
- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed 20 feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)
 - Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed 30 feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)
 - The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)
8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.
9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.
10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.
11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

- | | |
|--|--|
| ☐ seed mixture 1 | ☐ seed mixture 3 |
| ☐ seed mixture 2 | ☐ seed mixture 4 |
| ☒ seed mixture 2/LPC | ☐ Aplomado Falcon Mixture |

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

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

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches that are not otherwise fenced, screened, or netted to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or

other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

- a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
- b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

19. Special Stipulations:

Lesser Prairie-Chicken

Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the application (Grant, Sundry Notice, APD) and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and

especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

- a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
- b. Activities of other parties including, but not limited to:
 - (1) Land clearing.
 - (2) Earth-disturbing and earth-moving work.
 - (3) Blasting.
 - (4) Vandalism and sabotage.
- c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars (\$1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of

the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve the holder of any responsibility as provided herein.

6. All construction and maintenance activity will be confined to the authorized right-of-way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky or dune areas, the pipeline will be "snaked" around hummocks and dunes rather than suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State

Interagency Committee.

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

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

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

18. Special Stipulations:

- a. **Lesser Prairie-Chicken:** Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted.
- b. This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous

Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

A copy of the grant and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.
2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.
4. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.
5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the

above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrent shall be placed on all vertical poles that extend past the cross arms.

6. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

11. Special Stipulations:

- For reclamation remove poles, lines, transformer, etc. and dispose of properly.
- Fill in any holes from the poles removed.

Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken:

Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

VIII. INTERIM RECLAMATION

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

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

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

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

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

IX. FINAL ABANDONMENT & RECLAMATION

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

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

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

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

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

<u>Species</u>	<u>lb/acre</u>
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

*Pounds of pure live seed:

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

Operator Certification

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

NAME: Jenny Harms**Signed on:** 12/14/2018**Title:** Regulatory Compliance Professional**Street Address:** 333 W Sheridan Ave**City:** Oklahoma City**State:** OK**Zip:** 73102**Phone:** (405)552-6560**Email address:** jenny.harms@dv.com**Field Representative****Representative Name:** Ray Vaz**Street Address:** 333 WEST SHERIDAN AVE**City:** OKLAHOMA CITY**State:** OK**Zip:** 73102**Phone:** (575)748-1871**Email address:** ray.vaz@dv.com

APD ID: 10400037301

Submission Date: 12/14/2018

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Well Type: OIL WELL

Well Work Type: Drill

[Show Final Text](#)

Section 1 - General

APD ID: 10400037301

Tie to previous NOS?
Submission Date: 12/14/2018

BLM Office: CARLSBAD

User: Jenny Harms

Title: Regulatory Compliance

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM062223

Lease Acres: 617.92

Surface access agreement in place?
Allotted?
Reservation:
Agreement in place? NO

Federal or Indian agreement:
Agreement number:
Agreement name:
Keep application confidential? YES

Permitting Agent? NO

APD Operator: DEVON ENERGY PRODUCTION COMPANY LP

Operator letter of designation:

Operator Info

Operator Organization Name: DEVON ENERGY PRODUCTION COMPANY LP

Operator Address: 333 West Sheridan Avenue

Zip: 73102

Operator PO Box:
Operator City: Oklahoma City **State:** OK

Operator Phone: (800)583-3866

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? EXISTING

Master Development Plan name: Todd/Apache MDP 2

Well in Master SUPO? NO

Master SUPO name:
Well in Master Drilling Plan? NO

Master Drilling Plan name:
Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Well API Number:
Field/Pool or Exploratory? Field and Pool

Field Name: SAND DUNES

Pool Name: BONE SPRING

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL,POTASH

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Describe other minerals:

Is the proposed well in a Helium production area? N Use Existing Well Pad? YES New surface disturbance? N

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name: TODD-Number: 8-5

APACHE MDP 2 PAD

Well Class: HORIZONTAL

Number of Legs:

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town:

Distance to nearest well: 280 FT

Distance to lease line: 302 FT

Reservoir well spacing assigned acres Measurement: 640 Acres

Well plat: ALLEY_CAT_17_20_FED_COM_526H_BLM_C102_20181213142129.pdf

Well work start Date: 04/28/2019

Duration: 45 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number: 6693

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	302	FSL	120 6	FEL	23S	32E	8	Aliquot SESE	32.31265 43	- 103.6920 706	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 098826	361 0	0	0
KOP Leg #1	252	FSL	400	FEL	23S	32E	8	Aliquot SESE	32.31250 4	- 103.6894 63	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 098826	- 527 2	894 2	888 2
PPP Leg #1	100	FNL	400	FEL	23S	32E	17	Aliquot NENE	32.31153 6	- 103.6894 63	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 062223	- 580 0	961 5	941 0

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

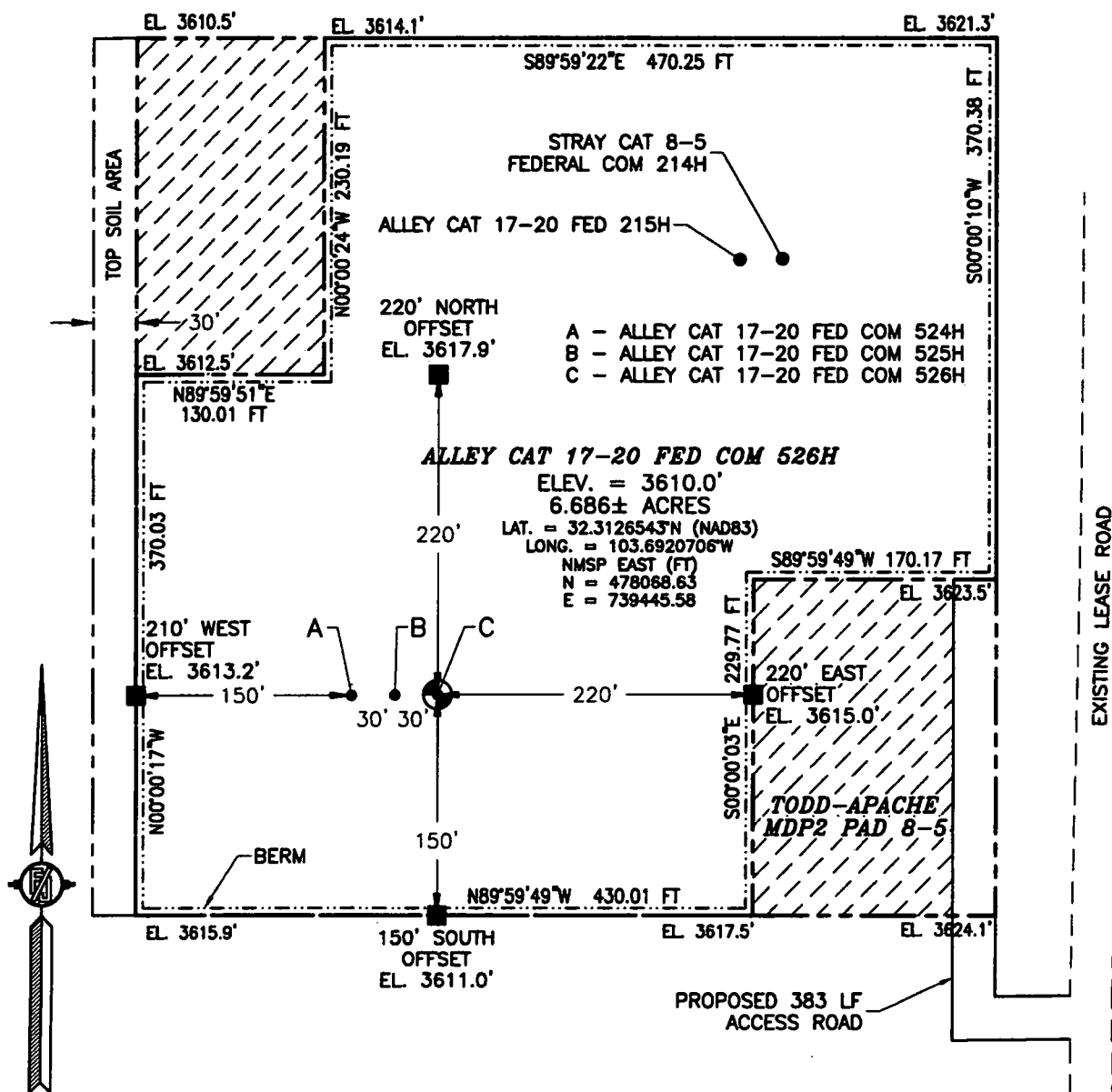
Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
PPP Leg #1	264 0	FSL	400	FEL	23S	32E	17	Aliquot NESE	32.30455 4	- 103.6894 59	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 097891	- 584 5	121 62	945 5
EXIT Leg #1	100	FSL	400	FEL	23S	32E	20	Aliquot SESE	32.28307 7	- 103.6894 5	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 086153	- 584 5	199 75	945 5
BHL Leg #1	20	FSL	400	FEL	23S	32E	20	Aliquot SESE	32.28285 73	- 103.6894 492	LEA	NEW MEXI CO	NEW MEXI CO	F	NMNM 086153	- 584 5	200 55	945 5

SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83) LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE. VERTICAL DATUM NAVD88.



012 60 120 240

SCALE 1" = 120'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF STATE HWY 128 AND CR 788 (RED ROAD) GO NORTH ON CR 788 APPROX. 3.5 MILES TO A LEASE ROAD ON RIGHT (EAST). TURN EAST GO APPROX. 2.1 MILES, ROAD TURNS RIGHT (SOUTH) GO SOUTH APPROX. 0.5 OF A MILE, ROAD TURNS LEFT (EAST) GO EAST APPROX. 0.85 OF A MILE TO A LEASE ROAD ON LEFT (NORTH). TURN NORTH GO APPROX. 0.92 OF A MILE TO A PROPOSED ROAD ON LEFT (WEST) GO WEST APPROX. 82', TURN NORTH GO APPROX. 301' TO SOUTHEAST PAD CORNER FOR THIS LOCATION.

DEVON ENERGY PRODUCTION COMPANY, L.P.
ALLEY CAT 17-20 FED COM 526H
LOCATED 302 FT. FROM THE SOUTH LINE
AND 1206 FT. FROM THE EAST LINE OF
SECTION 8, TOWNSHIP 23 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
LAND STATUS: BLM

NOVEMBER 14, 2018

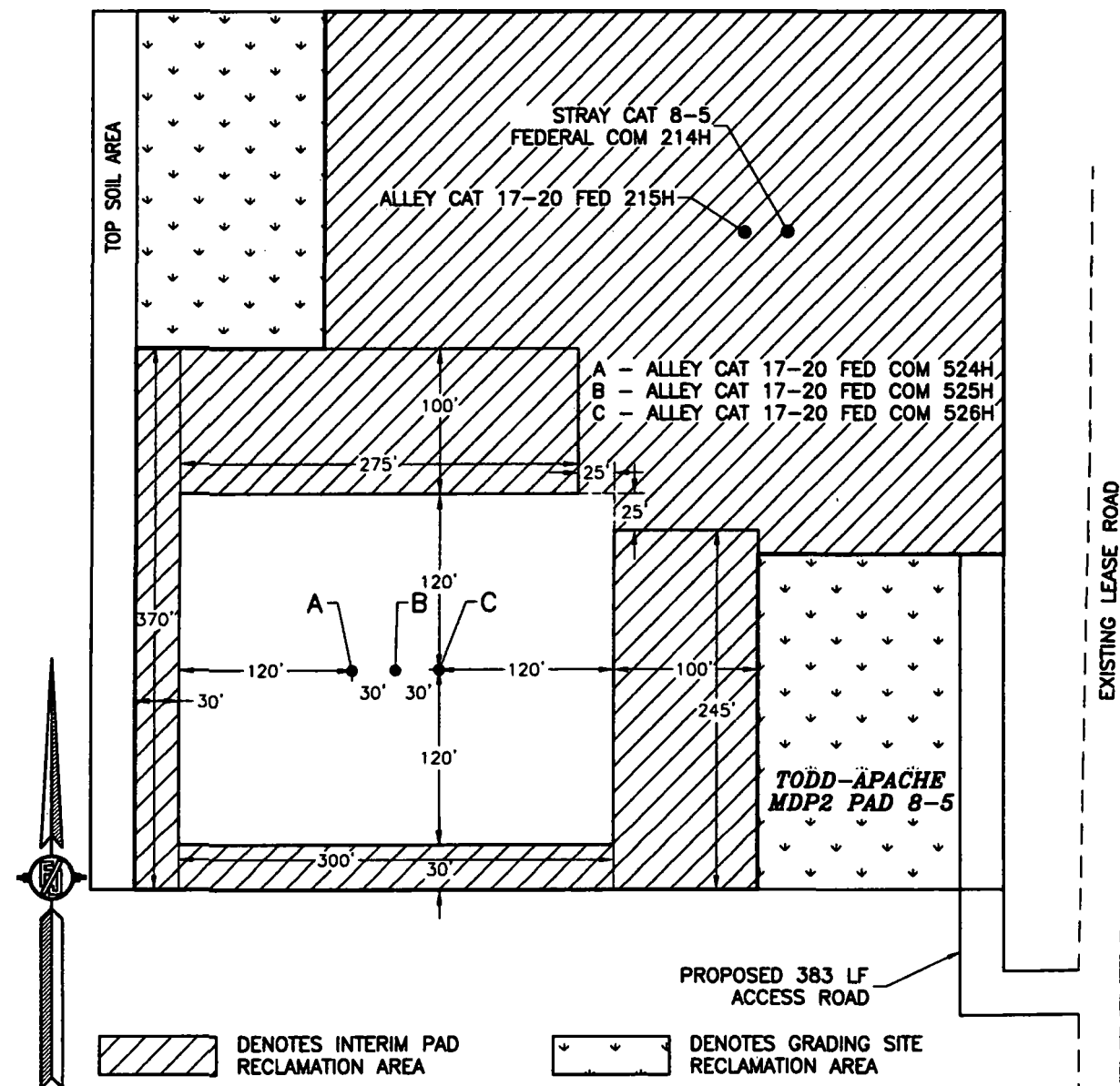
SURVEY NO. 6693

MADRON SURVEYING, INC.

301 SOUTH CANAL
(575) 234-3341

CARLSBAD, NEW MEXICO

SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
INTERIM SITE BUILD PLAN



012 60 120 240
SCALE 1" = 120'

5.033± ACRES INTERIM PAD RECLAMATION AREA
1.426± ACRES GRADING SITE RECLAMATION AREA
1.811± ACRES NON-RECLAIMED AREA
8.270± ACRES TODD-APACHE MDP2 PAD 8-5

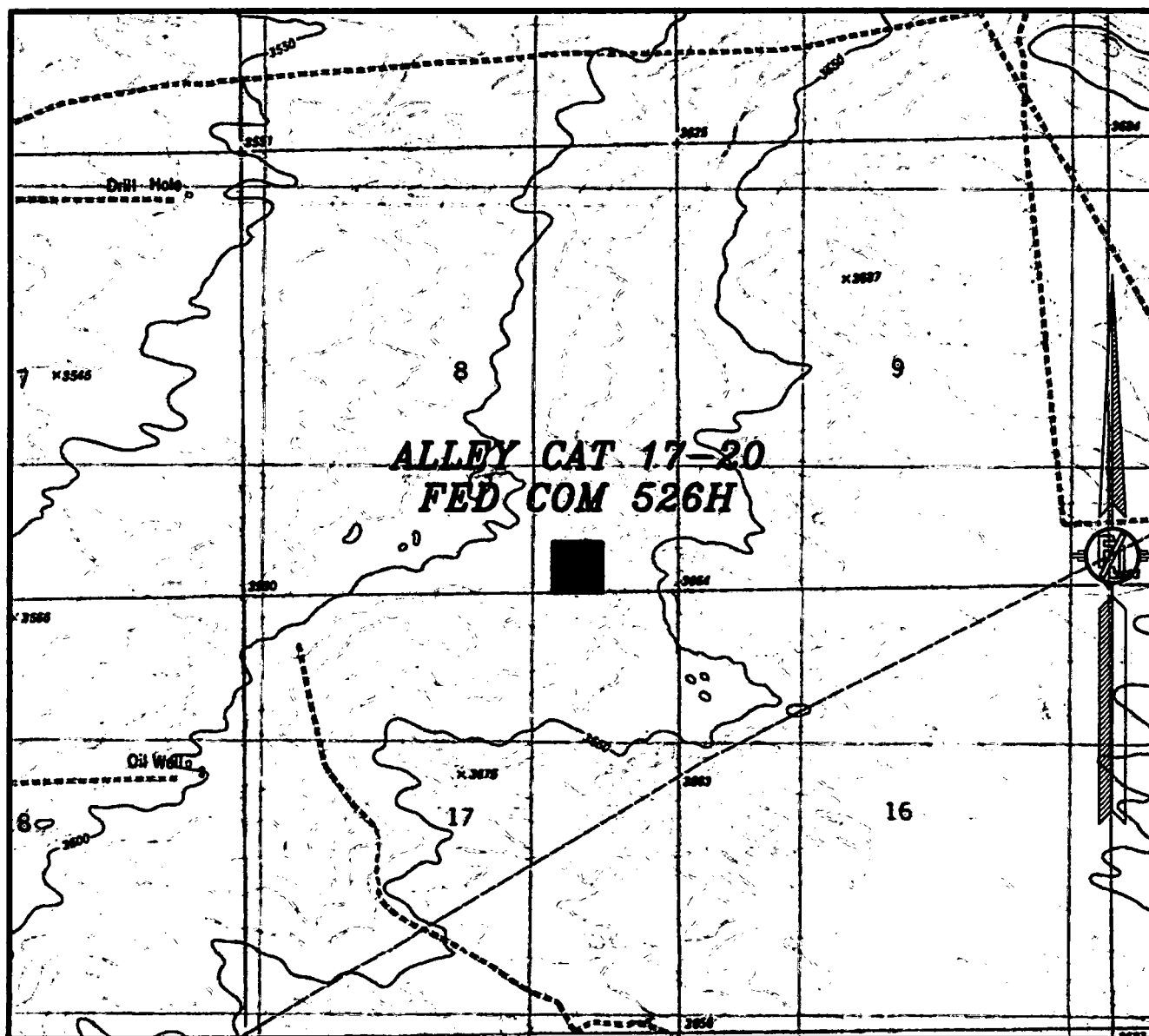
DEVON ENERGY PRODUCTION COMPANY, L.P.
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SECTION 8, TOWNSHIP 23 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
LAND STATUS: BLM

NOVEMBER 14, 2018

SURVEY NO. 6693

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

8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
LOCATION VERIFICATION MAP



**USGS QUAD MAP:
BOOTLEG RIDGE**

NOT TO SCALE

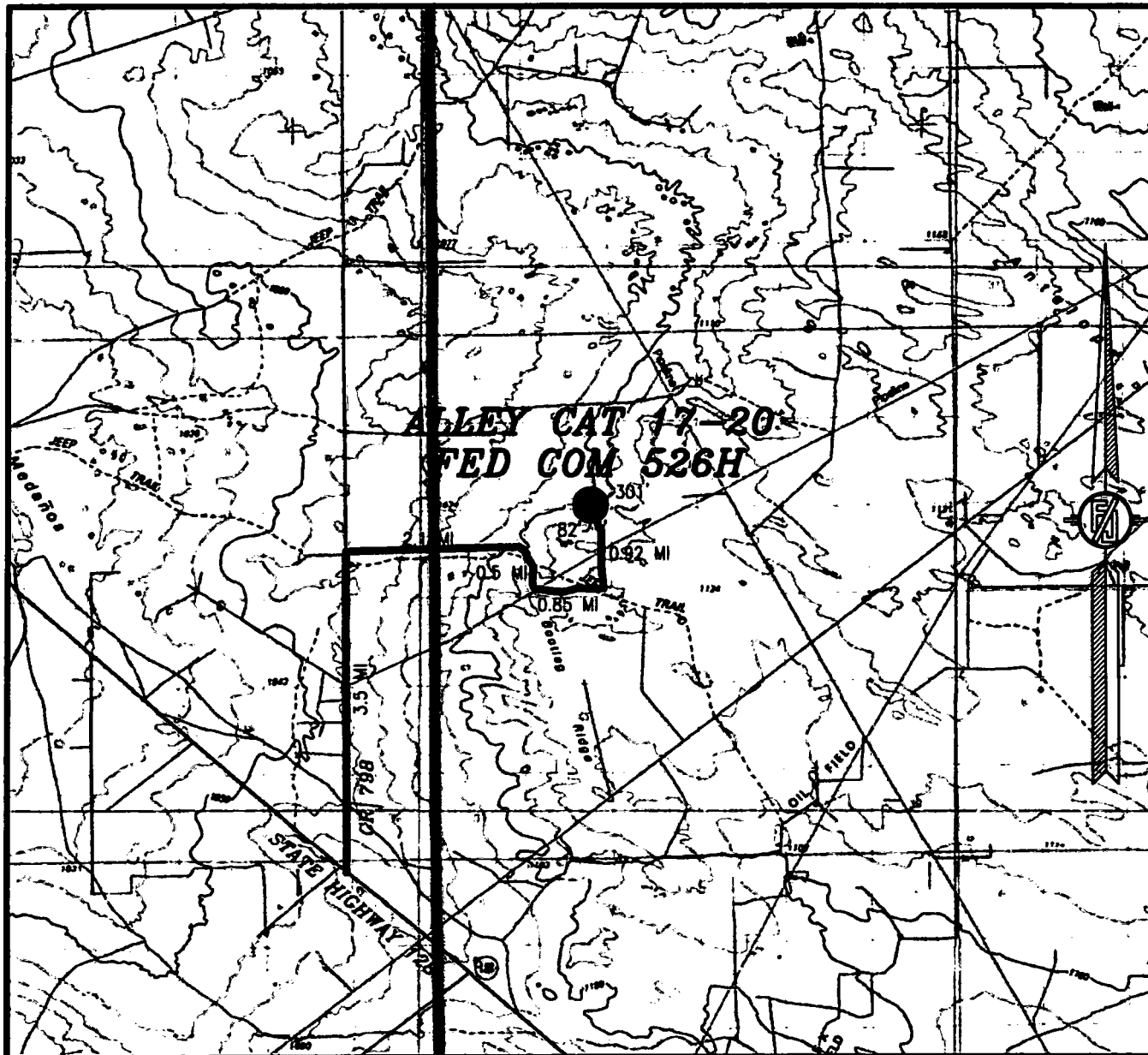
**DEVON ENERGY PRODUCTION COMPANY, L.P.
ALLEY CAT 17-20 FED COM 526H
LOCATED 302 FT. FROM THE SOUTH LINE
AND 1206 FT. FROM THE EAST LINE OF
SECTION 8, TOWNSHIP 23 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
LAND STATUS: BLM**

NOVEMBER 14, 2018

SURVEY NO. 6693

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

SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.

ALLEY CAT 17-20 FED COM 526H

LOCATED 302 FT. FROM THE SOUTH LINE
AND 1206 FT. FROM THE EAST LINE OF

SECTION 8, TOWNSHIP 23 SOUTH,
RANGE 32 EAST, N.M.P.M.

LEA COUNTY, STATE OF NEW MEXICO
LAND STATUS: BLM

DIRECTIONS TO LOCATION

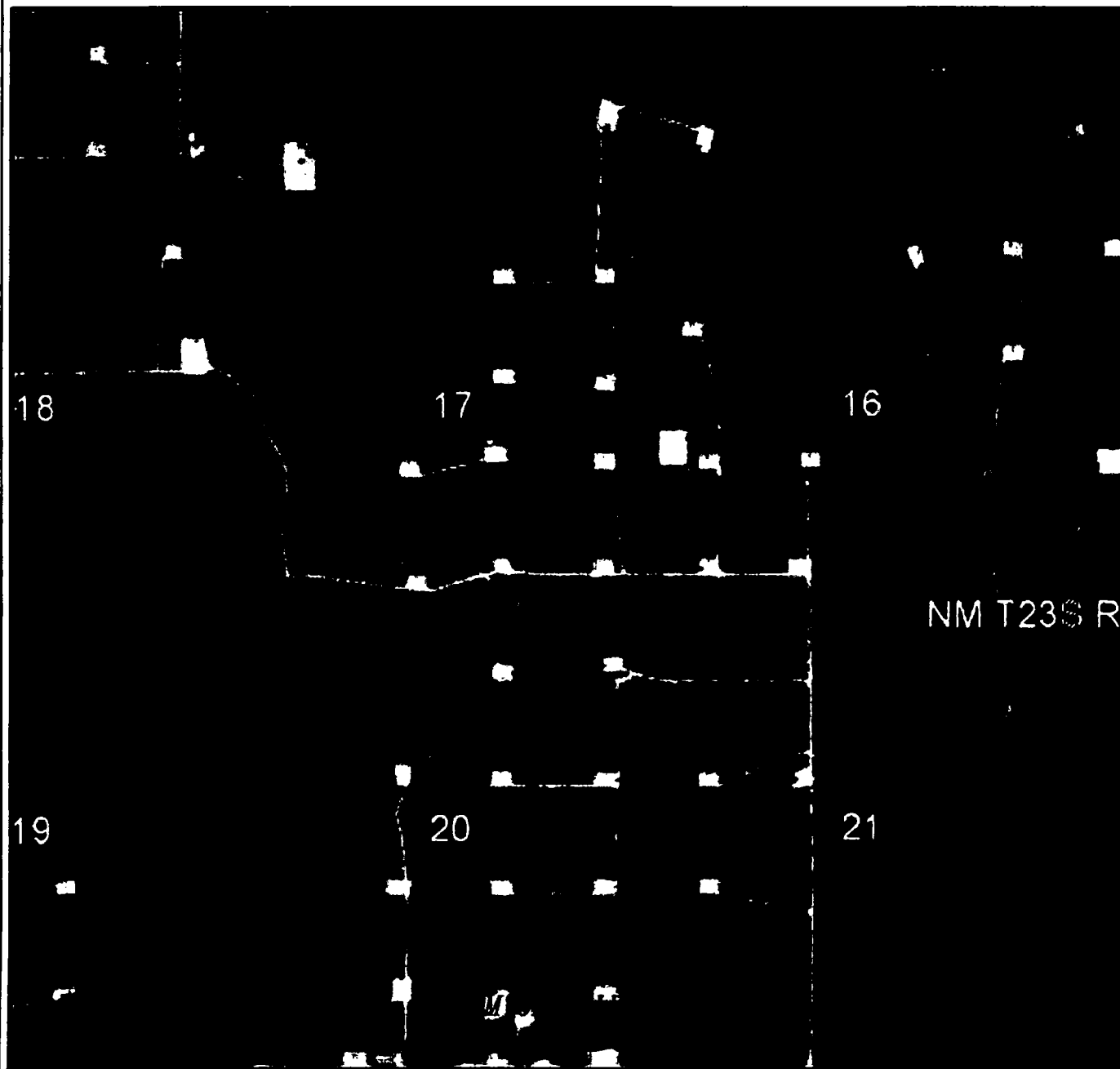
FROM THE INTERSECTION OF STATE HWY 128 AND CR 798 (RED ROAD) GO NORTH ON CR 798 APPROX. 3.5 MILES TO A LEASE ROAD ON RIGHT (EAST), TURN EAST GO APPROX. 2.1 MILES, ROAD TURNS RIGHT (SOUTH) GO SOUTH APPROX. 0.5 OF A MILE, ROAD TURNS LEFT (EAST) GO EAST APPROX. 0.85 OF A MILE TO A LEASE ROAD ON LEFT (NORTH), TURN NORTH GO APPROX. 0.92 OF A MILE TO A PROPOSED ROAD ON LEFT (WEST) GO WEST APPROX. 82', TURN NORTH GO APPROX. 301' TO SOUTHEAST PAD CORNER FOR THIS LOCATION.

NOVEMBER 14, 2018

SURVEY NO. 6693

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

**SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
AERIAL PHOTO**



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEBRUARY 2017

**DEVON ENERGY PRODUCTION COMPANY, L.P.
ALLEY CAT 17-20 FED COM 526H
LOCATED 302 FT. FROM THE SOUTH LINE
AND 1206 FT. FROM THE EAST LINE OF
SECTION 8, TOWNSHIP 23 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
LAND STATUS: BLM**

NOVEMBER 14, 2018

SURVEY NO. 6693

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

**SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
ACCESS AERIAL ROUTE MAP**



**NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEBRUARY 2017**

**DEVON ENERGY PRODUCTION COMPANY, L.P.
ALLEY CAT 17-20 FED COM 526H
LOCATED 302 FT. FROM THE SOUTH LINE
AND 1206 FT. FROM THE EAST LINE OF
SECTION 8, TOWNSHIP 23 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
LAND STATUS: BLM**

NOVEMBER 14, 2018

SURVEY NO. 6693

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

PLAN VIEW

TODD-APACHE
MDP2 PAD 8-4

STRAY CAT 8-5
FEDERAL COM 214H

ALLEY CAT 17-20
FED 215H

LIMITS OF
EARTHWORK
3:1 SLOPE (TYP.)

DRILLING PAD

TODD-APACHE
MDP2 PAD 8-5
CENTER POINT

LIMITS OF
EARTHWORK
3:1 SLOPE (TYP.)

TODD-APACHE
MDP2 PAD 8-5
PROPOSED PAD
EL. = 3613.0

A - ALLEY CAT 17-20 FED COM 524H
B - ALLEY CAT 17-20 FED COM 525H
C - ALLEY CAT 17-20 FED COM 526H

PROPOSED 383 LF
ACCESS ROAD

DEVON ENERGY PRODUCTION COMPANY, L.P.
GRADING PLAN AND CROSS SECTIONS
FOR ALLEY CAT 17-20 FED COM 526H
SECTION 8, TOWNSHIP 23 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

012 60 120 240
SCALE 1" = 120'

CUT	FILL	NET
48629 CU. YD	9006 CU. YD	39623 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

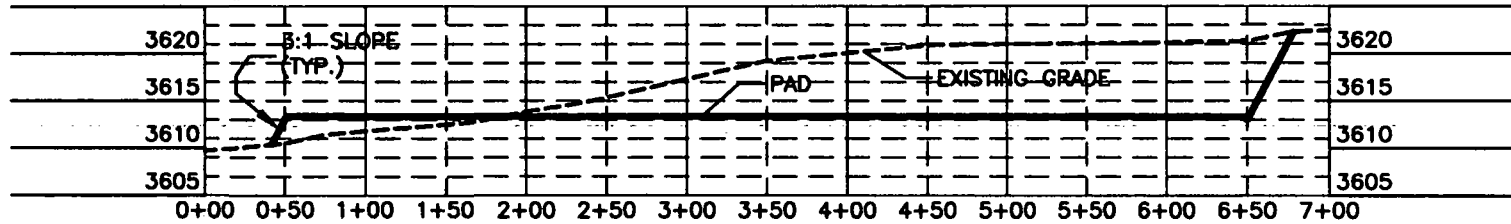
NOVEMBER 14, 2018

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

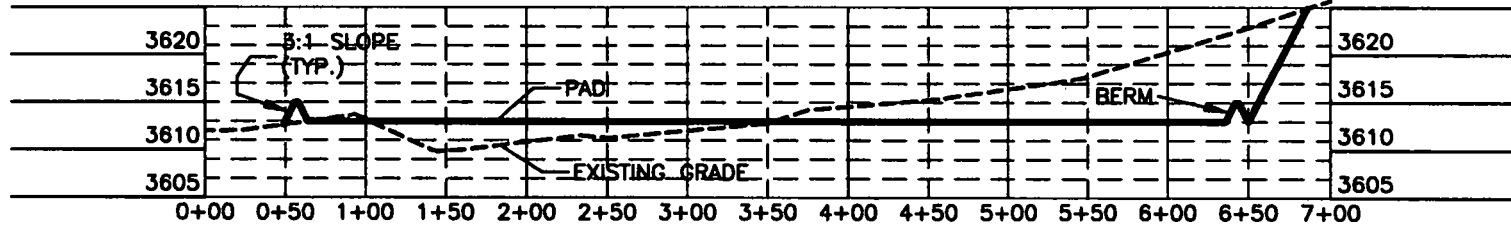
SHEET 1-2
SURVEY NO. 6693

CROSS-SECTIONS

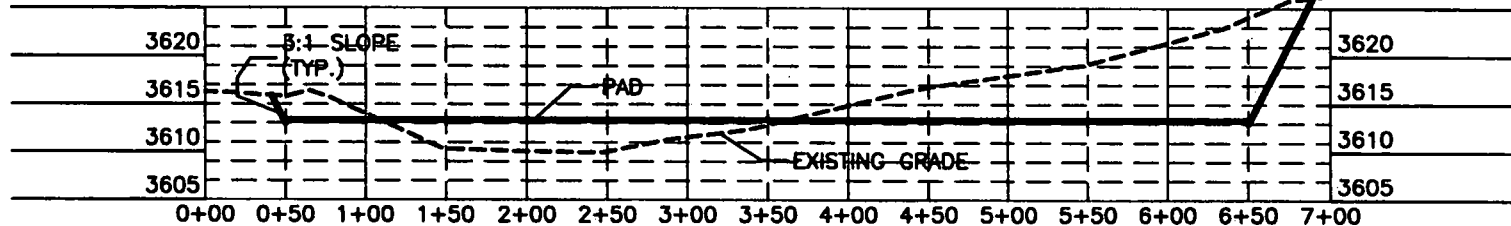
SECTION A-A'



SECTION B-B'



SECTION C-C'



DEVON ENERGY PRODUCTION COMPANY, L.P.
 GRADING PLAN AND CROSS SECTIONS
 FOR ALLEY CAT 17-20 FED COM 526H
 SECTION 8, TOWNSHIP 23 SOUTH,
 RANGE 32 EAST, N.M.P.M.
 LEA COUNTY, STATE OF NEW MEXICO

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

CUT	FILL	NET
48629 CU. YD	9006 CU. YD	39623 CU. YD (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

NOVEMBER 14, 2018

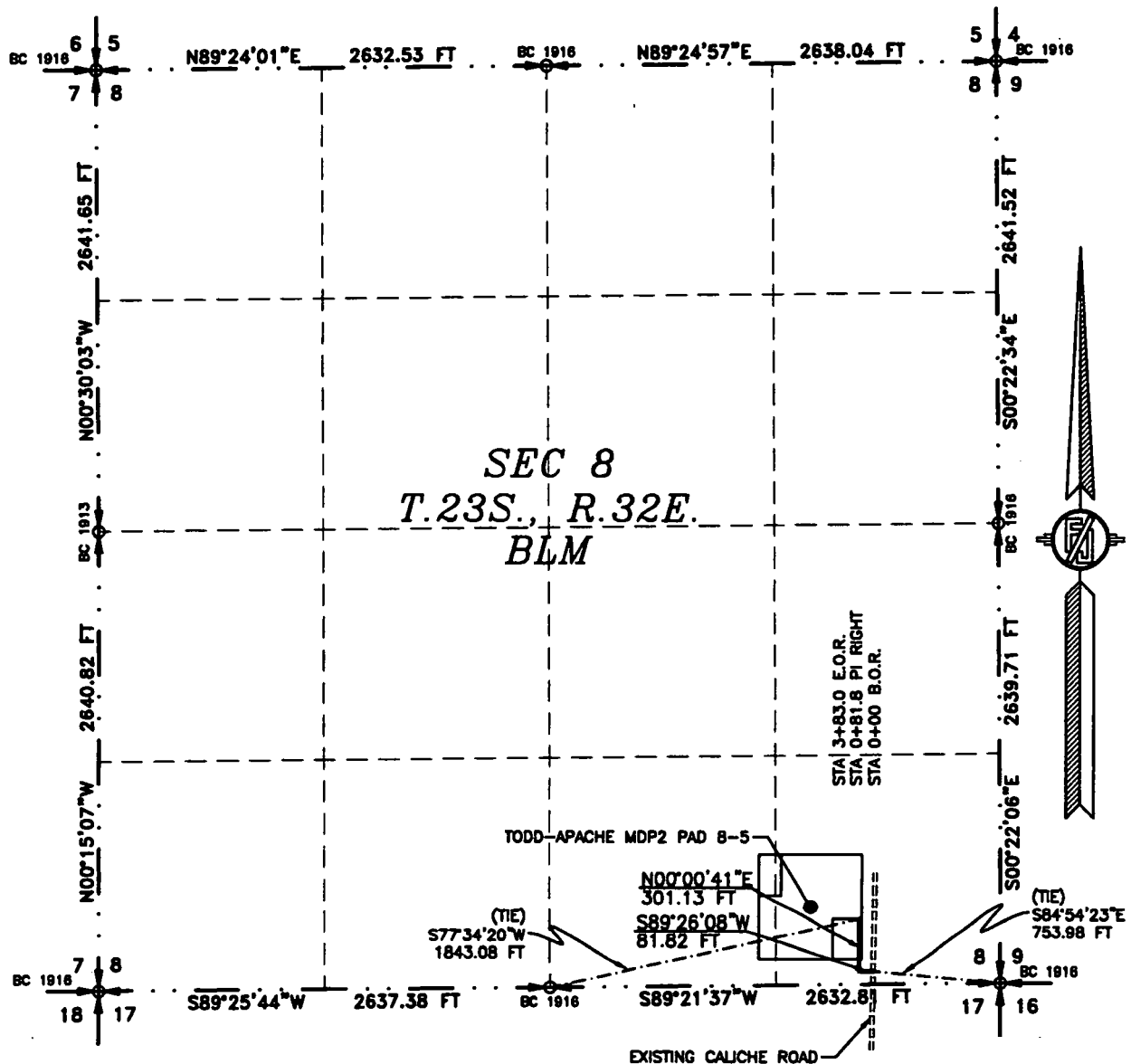
MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO
 (575) 234-3341

SHEET 2-2
 SURVEY NO. 6693

ACCESS ROAD PLAT

ACCESS ROAD TO THE TODD-APACHE MDP2 PAD 8-5 (ALLEY CAT 17-20 FED COM 524H, 525H, 526H,
ALLEY CAT 17-20 FED 215H, STRAY CAT 8-5 FEDERAL COM 214H)

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
NOVEMBER 14, 2018



SEE NEXT SHEET (2-2) FOR DESCRIPTION

SURVEYOR CERTIFICATE

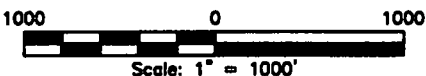
I, FILMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 14 DAY OF NOVEMBER 2018

[Signature of Filmon F. Jaramillo]
FILMON F. JARAMILLO, 12797
301 SOUTH CANAL, CARLSBAD, NEW MEXICO 88220
(575) 234-3341

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

SURVEY NO. 6693



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: 1-2

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD TO THE TODD-APACHE MDP2 PAD 8-5 (ALLEY CAT 17-20 FED COM 524H, 525H, 526H,
ALLEY CAT 17-20 FED 215H, STRAY CAT 8-5 FEDERAL COM 214H)

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
NOVEMBER 14, 2018

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE SE/4 SE/4 OF SAID SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M., WHENCE THE SOUTHEAST CORNER OF SAID SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M. BEARS S84°54'23"E, A DISTANCE OF 753.98 FEET;
THENCE S89°26'08"W A DISTANCE OF 81.82 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N00°00'41"E A DISTANCE OF 301.13 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE SOUTH QUARTER CORNER OF SAID SECTION 8, TOWNSHIP 23 SOUTH, RANGE 32 EAST, N.M.P.M. BEARS S77°34'20"W, A DISTANCE OF 1843.08 FEET;

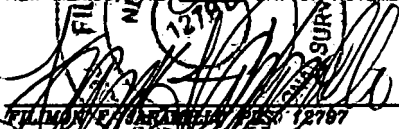
SAID STRIP OF LAND BEING 382.95 FEET OR 23.21 RODS IN LENGTH, CONTAINING 0.264 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

SE/4 SE/4 382.95 L.F. 23.21 RODS 0.264 ACRES

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 14 DAY OF NOVEMBER 2018


FILIMON F. JARAMILLO, SURV. NO. 12797

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: 2-2

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

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

SURVEY NO. 6693

APD ID: 10400037301

Submission Date: 12/14/2018

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Well Type: OIL WELL

Well Work Type: Drill

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	UNKNOWN	3610	0	0	ALLUVIUM,OTHER : Surface	NONE	No
2	RUSTLER	2562	1048	1048	SALT	NONE	No
3	SALADO	2187	1423	1423	SALT	NONE	No
4	BASE OF SALT	-1033	4643	4643	SALT	NONE	No
5	DELAWARE	-1063	4673	4673	SANDSTONE	NATURAL GAS,OIL	No
6	BONE SPRING LIME	-5038	8648	8648	LIMESTONE	NATURAL GAS,OIL	No
7	BONE SPRING	-5845	9455	19455	SANDSTONE	NATURAL GAS,OIL	Yes

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M

Rating Depth: 9455

Equipment: BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below surface casing. BOP/BOPE system with a minimum rating consistent with value listed above will be installed on the wellhead system. BOP/BOPE will be tested by an independent service company per Onshore Oil & Gas Order #2 requirements and MASP (Maximum Anticipated Surface Pressure) calculations. If the system is upgraded, all the components installed will be functional and tested.

Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP stack to the choke manifold. See attached for specs for hydrostatic test chart.

Testing Procedure: 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.

Choke Diagram Attachment:

5M_BOPE__CK_20181213094458.pdf

BOP Diagram Attachment:

5M_BOPE__CK_20181213094514.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Pressure Rating (PSI): 5M

Rating Depth: 4773

Equipment: BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below surface casing, BOP/BOPE system with a minimum rating consistent with value listed above will be installed on the wellhead system. BOP/BOPE will be tested by an independent service company per Onshore Oil & Gas Order #2 requirements and MASP (Maximum Anticipated Surface Pressure) calculations. If the system is upgraded, all the components installed will be functional and tested.

Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP stack to the choke manifold. See attached for specs for hydrostatic test chart.

Testing Procedure: 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.

Choke Diagram Attachment:

5M_BOPE__CK_20181213094639.pdf

BOP Diagram Attachment:

5M_BOPE__CK_20181213094656.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	1073	0	1073	-6965	-8031	1073	H-40	48	STC	1.125	1	BUOY	1.6	BUOY	1.6
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4773	0	4773			4773	J-55	40	OTHER - BTC	1.125	1	BUOY	1.6	BUOY	1.6
3	PRODUCTION	8.75	5.5	NEW	API	N	0	20055	0	9455	-6965	-17514	20055	P-110	17	OTHER - BTC	1.125	1	BUOY	1.6	BUOY	1.6

Casing Attachments

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Surf_Csg_Ass_20181213094858.pdf

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Int_Csg_Ass_20181213094959.pdf

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Prod_Csg_Ass_20181214062006.pdf

Section 4 - Cement

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1073		1.33	13.2	1490.7	100	C	Class C + adds

INTERMEDIATE	Lead		0	4273		1.94	9	1418	50	c	Class C + adds
INTERMEDIATE	Tail		4273	4773			13.2		50	C	
PRODUCTION	Lead		4273	8942		3.27	9	1301.8	10	TUNED	Class C + adds
PRODUCTION	Tail		8942	20055			13.2		10	H	

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
1073	4773	OTHER : BRINE	10	10.5							

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
4773	9455	WATER-BASED MUD	8.5	9							
0	1073	OTHER : FRESH WATER	8.5	9							

Section 6 - Test, Logging, Coring

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

Will run GRMWD from TD to from KOP. Cement bond logs will be run in vertical to determine top of cement. Stated logs run will be in the completion report and submitted to the BLM.

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

CALIPER,CBL,DS,GR,MUDLOG

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4425

Anticipated Surface Pressure: 2344.9

Anticipated Bottom Hole Temperature(F): 151

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geohazards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Alley_Cat_17_20_Fed_Com_526H_H2S_20181213143720.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

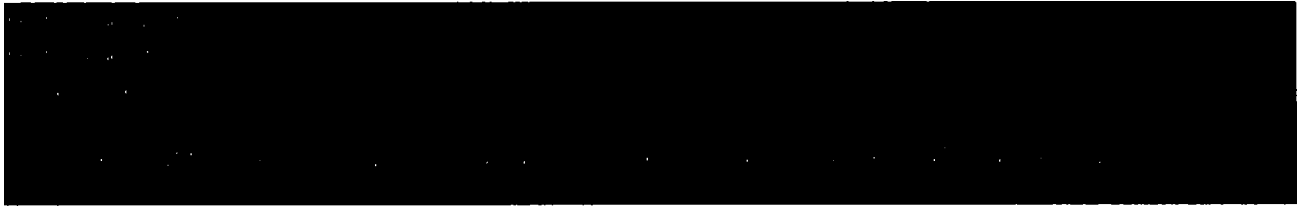
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Devon_Alley_Cat_17_20_Fed_Com_526H_Permit_Plan_1_20181213143823.pdf

Devon_Alley_Cat_17_20_Fed_Com_526H_Plot_Permit_Plan_1_20181213143823.pdf

Drilling_Plan_Alley_Cat_17_20_Fed_Com_526H_6_3_2019_20190603093417.pdf

Other proposed operations facets description:



Other proposed operations facets attachment:

MB_Wellhd_5M_20181213121039.pdf

ALLEY_CAT_GasCapturePlan_12_13_2018_20181213121145.pdf

Clsd_Loop_20181213121037.pdf

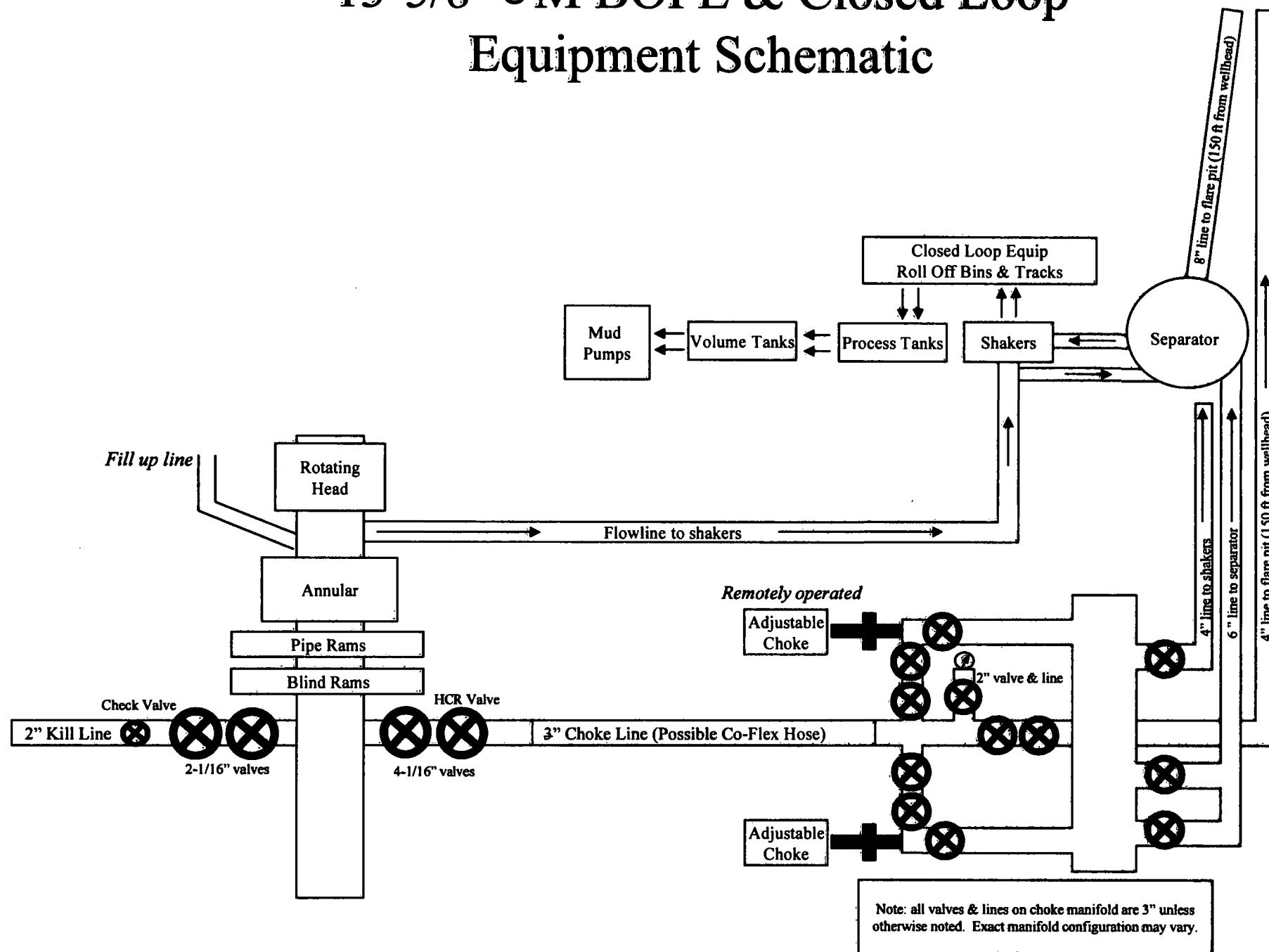
MB_Verb_5M_20181213121038.pdf

Spudder_Rig_Info_20190422122954.pdf

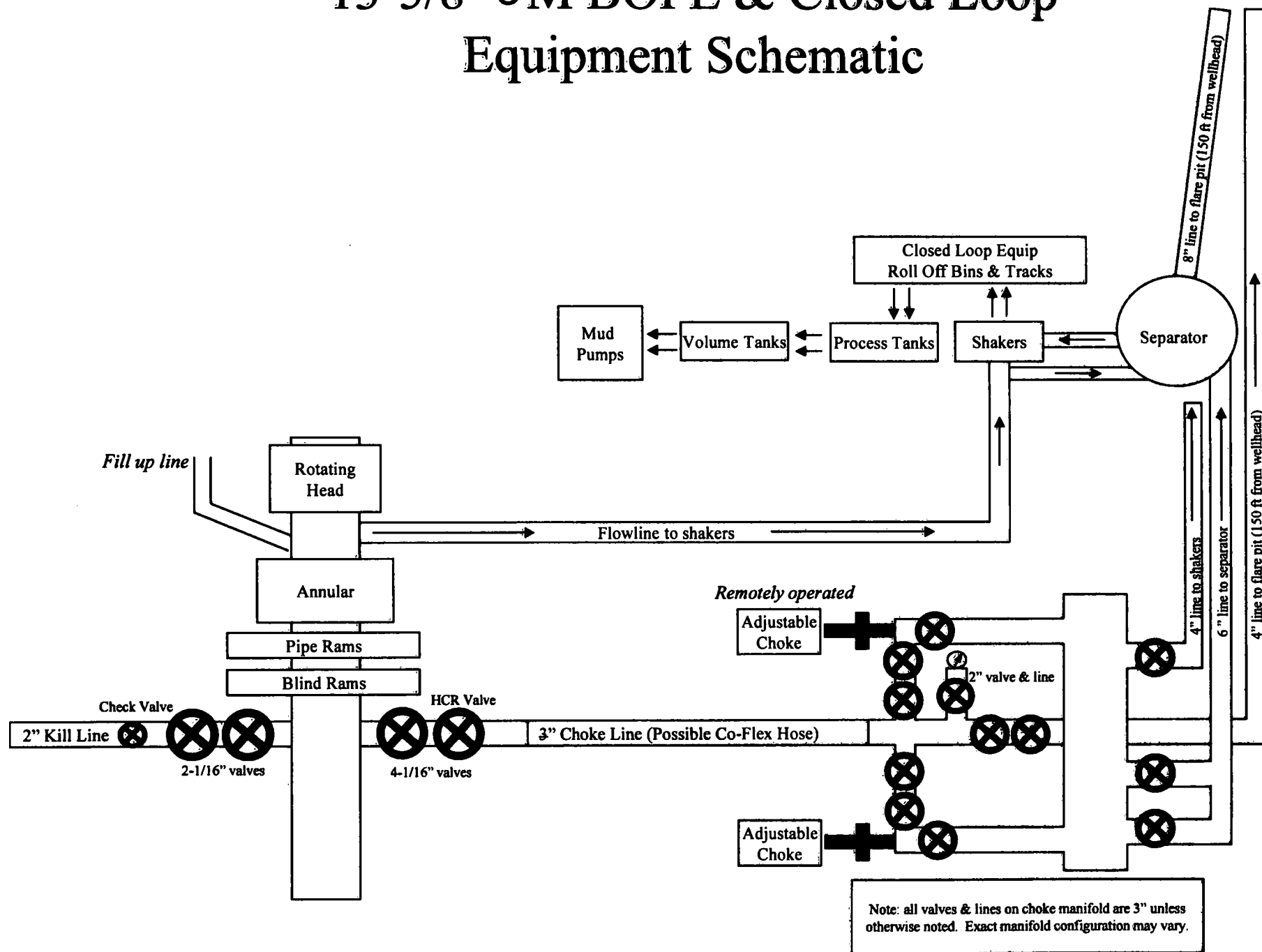
Other Variance attachment:

Co_flex_20181213121301.pdf

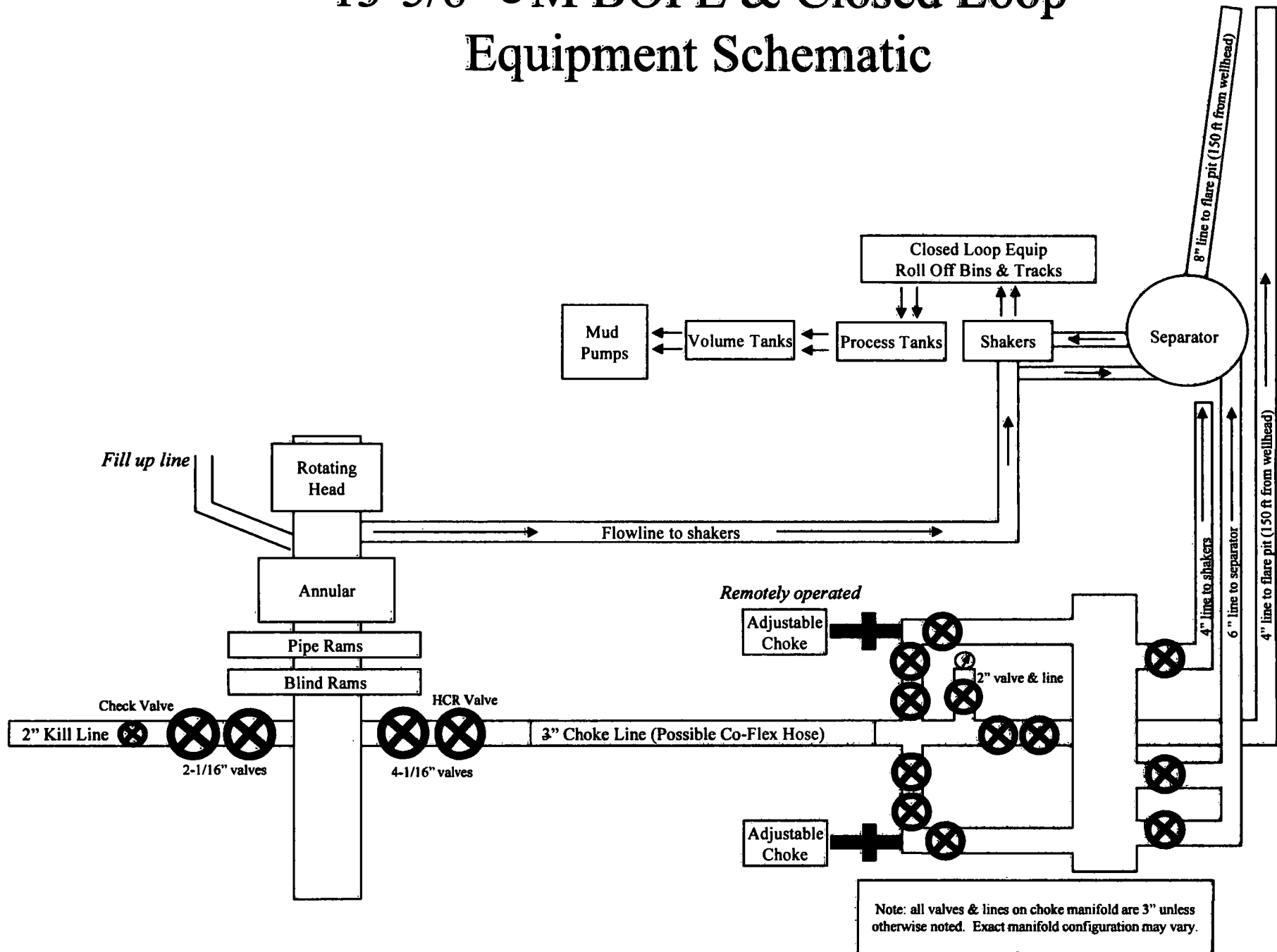
13-5/8" 5M BOPE & Closed Loop Equipment Schematic



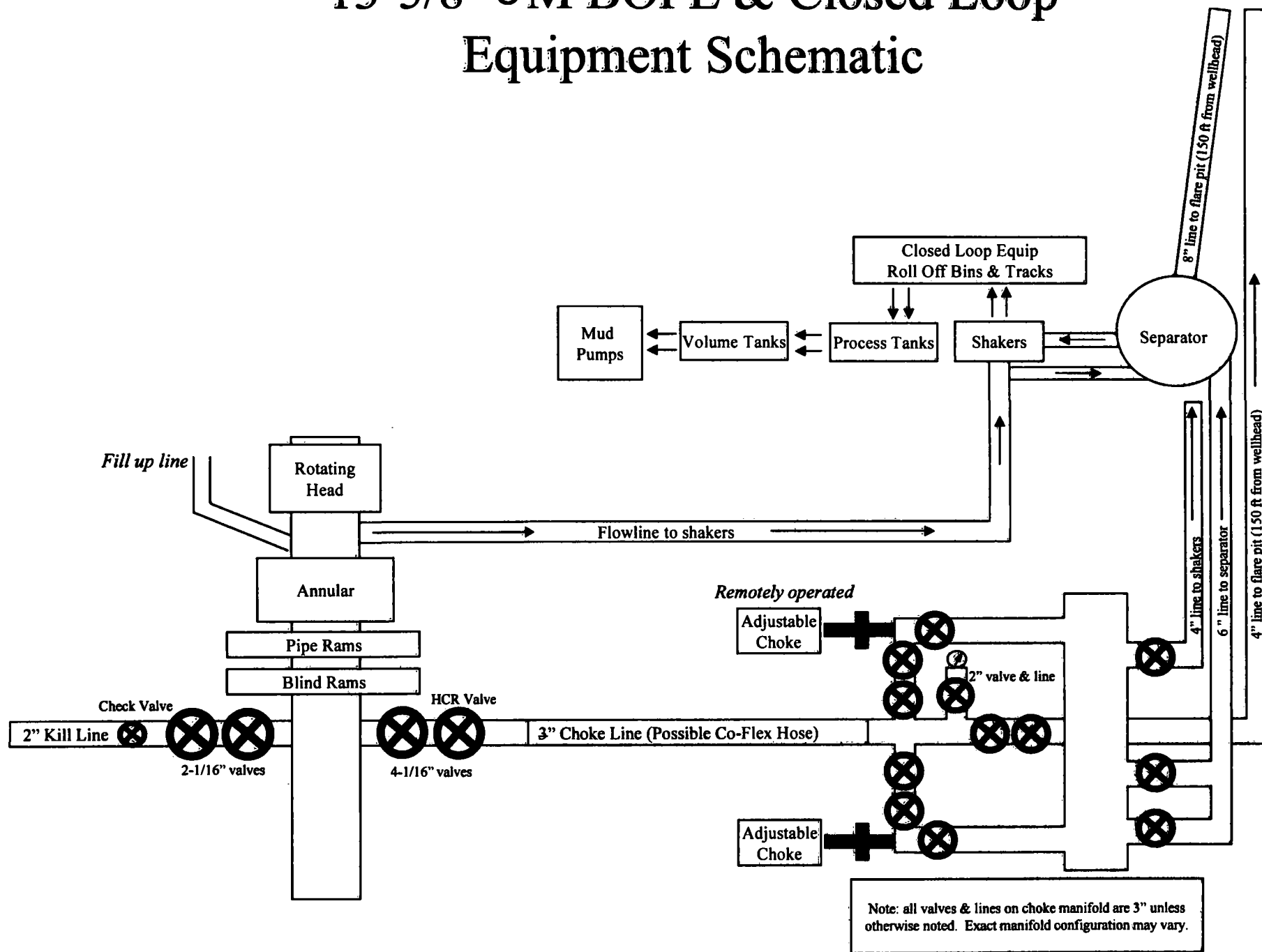
13-5/8" 5M BOPE & Closed Loop Equipment Schematic



13-5/8" 5M BOPE & Closed Loop Equipment Schematic



13-5/8" 5M BOPE & Closed Loop Equipment Schematic



Casing Assumptions and Load Cases

Production

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Production Casing Burst Design		
Load Case	External Pressure	Internal Pressure
Pressure Test	Formation Pore Pressure	Fluid in hole (water or produced water) + test psi
Tubing Leak	Formation Pore Pressure	Packer @ KOP, leak below surface 8.6 ppg packer fluid
Stimulation	Formation Pore Pressure	Max frac pressure with heaviest frac fluid

Production Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC.	None
Cementing	Wet cement weight	Water (8.33ppg)

Production Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A

Casing Assumptions and Load Cases

Intermediate

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Intermediate Casing Burst Design		
Load Case	External Pressure	Internal Pressure
Pressure Test	Formation Pore Pressure	Max mud weight of next hole-section plus Test psi
Drill Ahead	Formation Pore Pressure	Max mud weight of next hole section
Fracture @ Shoe	Formation Pore Pressure	Dry gas

Intermediate Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC	None
Cementing	Wet cement weight	Water (8.33ppg)

Intermediate Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A

Casing Assumptions and Load Cases

Surface

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Surface Casing Burst Design		
Load Case	External Pressure	Internal Pressure
Pressure Test	Formation Pore Pressure	Max mud weight of next hole-section plus Test psi
Drill Ahead	Formation Pore Pressure	Max mud weight of next hole section
Displace to Gas	Formation Pore Pressure	Dry gas from next casing point

Surface Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC	None
Cementing	Wet cement weight	Water (8.33ppg)

Surface Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	3 ft/s
Service Loads	N/A

Casing Assumptions and Load Cases

Production

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Production Casing Burst Design		
Load Case	External Pressure	Internal Pressure
Pressure Test	Formation Pore Pressure	Fluid in hole (water or produced water) + test psi
Tubing Leak	Formation Pore Pressure	Packer @ KOP, leak below surface 8.6 ppg packer fluid
Stimulation	Formation Pore Pressure	Max frac pressure with heaviest frac fluid

Production Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC.	None
Cementing	Wet cement weight	Water (8.33ppg)

Production Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A

Casing Assumptions and Load Cases

Production

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Production Casing Burst Design		
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Production Casing Collapse Design		
Load Case	External Pressure	Internal Pressure
Full Evacuation	Water gradient in cement, mud above TOC.	None
Cementing	Wet cement weight	Water (8.33ppg)

Production Casing Tension Design	
Load Case	Assumptions
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A



**Devon Energy Center
333 West Sheridan Avenue
Oklahoma City, Oklahoma 73102-5015**

Hydrogen Sulfide (H₂S) Contingency Plan

For

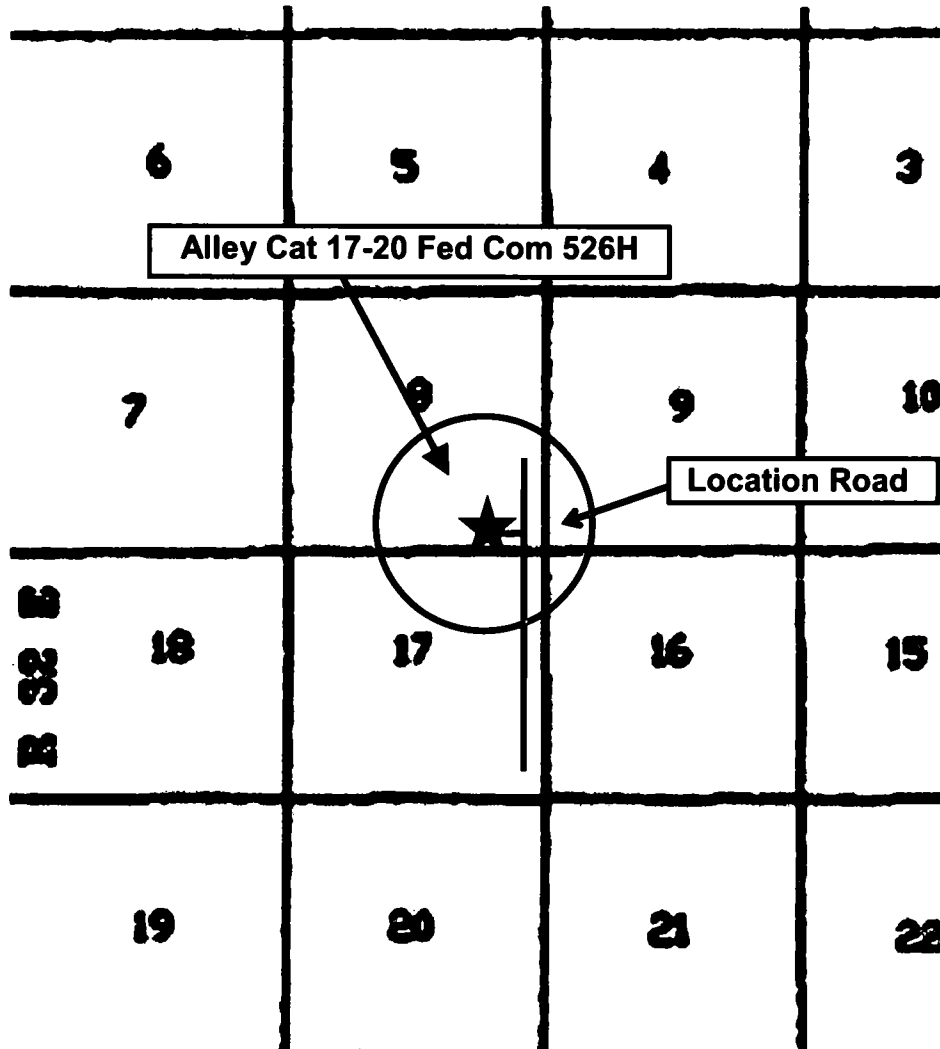
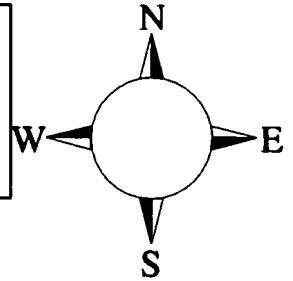
Alley Cat 17-20 Fed Com 526H

**Sec-8 T-23S R-32E
302' FSL & 1206' FEL
LAT. = 32.3126543' N (NAD83)
LONG = 103.6920706' W**

Lea County NM

Alley Cat 17-20 Fed Com 526H

This is an open drilling site. H₂S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H₂S, including warning signs, wind indicators and H₂S monitor.



Assumed 100 ppm ROE = 3000' (Radius of Exposure)
100 ppm H₂S concentration shall trigger activation of this plan.

Escape

Crews shall escape upwind of escaping gas in the event of an emergency release of gas. Escape can be facilitated from the location entrance road. Crews should then block the entrance to the location from the lease road so as not to allow anyone traversing into a hazardous area. The blockade should be at a safe distance outside of the ROE. There are no homes or buildings in or near the ROE.

Assumed 100 ppm ROE = 3000'

100 ppm H₂S concentration shall trigger activation of this plan.

Emergency Procedures

In the event of a release of gas containing H₂S, the first responder(s) must

- **Isolate the area and prevent entry by other persons into the 100 ppm ROE.**
- **Evacuate any public places encompassed by the 100 ppm ROE.**
- **Be equipped with H₂S monitors and air packs in order to control the release.**
- **Use the “buddy system” to ensure no injuries occur during the response**
- **Take precautions to avoid personal injury during this operation.**
- **Contact operator and/or local officials to aid in operation. See list of phone numbers attached.**
- **Have received training in the**
 - **Detection of H₂S, and**
 - **Measures for protection against the gas,**
 - **Equipment used for protection and emergency response.**

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO₂). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas

Characteristics of H₂S and SO₂

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H₂S	1.189 Air = 1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO₂	2.21 Air = 1	2 ppm	N/A	1000 ppm

Contacting Authorities

Devon Energy Corp. personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available. The following call list of essential and potential responders has been prepared for use during a release. Devon Energy Corp. Company response must be in coordination with the State of New Mexico's 'Hazardous Materials Emergency Response Plan' (HMER)

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE (H₂S) TRAINING

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

1. The hazards and characteristics of hydrogen sulfide (H₂S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H₂S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

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

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

There will be an initial training session just prior to encountering a known or probable H₂S zone (within 3 days or 500 feet) and weekly H₂S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H₂S Drilling Operations Plan and the Public Protection Plan.

II. HYDROGEN SULFIDE TRAINING

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

1. Well Control Equipment

- A. Flare line
- B. Choke manifold – Remotely Operated
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
- D. Auxiliary equipment may include if applicable: annular preventer and rotating head.
- E. Mud/Gas Separator

2. Protective equipment for essential personnel:

30-minute SCBA units located at briefing areas, as indicated on well site diagram, with escape units available in the top doghouse. As it may be difficult to communicate audibly while wearing these units, hand signals shall be utilized.

3. H₂S detection and monitoring equipment:

Portable H₂S monitors positioned on location for best coverage and response. These units have warning lights which activate when H₂S levels reach 10 ppm and audible sirens which activate at 15 ppm. Sensor locations:

- Bell nipple
- Possum Belly/Shale shaker
- Rig floor
- Choke manifold
- Cellar

Visual warning systems:

- A. Wind direction indicators as shown on well site diagram
- B. Caution/ Danger signs shall be posted on roads providing direct access to locations. Signs will be painted a high visibility yellow with black lettering of sufficient size to be reasonable distance from the immediate location. Bilingual signs will be used when appropriate.

4. Mud program:

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

5. Metallurgy:

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H₂S trim.
- B. All elastomers used for packing and seals shall be H₂S trim.

6. Communication:

- A. Company personnel have/use cellular telephones in the field.
- B. Land line (telephone) communications at Office

7. Well testing:

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safety and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H₂S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

Devon Energy Corp. Company Call List		
Drilling Supervisor – Basin – Mark Kramer		405-823-4796
EHS Professional – Laura Wright		405-439-8129
Agency Call List		
Lea County (575)	Hobbs	
	Lea County Communication Authority	393-3981
	State Police	392-5588
	City Police	397-9265
	Sheriff's Office	393-2515
	Ambulance	911
	Fire Department	397-9308
	LEPC (Local Emergency Planning Committee)	393-2870
	NMOCD	393-6161
	US Bureau of Land Management	393-3612
Eddy County (575)	Carlsbad	
	State Police	885-3137
	City Police	885-2111
	Sheriff's Office	887-7551
	Ambulance	911
	Fire Department	885-3125
	LEPC (Local Emergency Planning Committee)	887-3798
	US Bureau of Land Management	887-6544
	NM Emergency Response Commission (Santa Fe)	(505) 476-9600
	24 HR	(505) 827-9126
	National Emergency Response Center	(800) 424-8802
	National Pollution Control Center: Direct	(703) 872-6000
	For Oil Spills	(800) 280-7118
	Emergency Services	
	Wild Well Control	(281) 784-4700
	Cudd Pressure Control	(915) 699-0139 (915) 563-3356
	Halliburton	(575) 746-2757
	B. J. Services	(575) 746-3569
Give GPS position:	Native Air – Emergency Helicopter – Hobbs	(575) 392-6429
	Flight For Life - Lubbock, TX	(806) 743-9911
	Aerocare - Lubbock, TX	(806) 747-8923
	Med Flight Air Amb - Albuquerque, NM	(575) 842-4433
	Lifeguard Air Med Svc. Albuquerque, NM	(800) 222-1222
	Poison Control (24/7)	(575) 272-3115
	Oil & Gas Pipeline 24 Hour Service	(800) 364-4366
	NOAA – Website - www.nhc.noaa.gov	

Prepared in conjunction with
Dave Small



WCDSC Permian NM

Lea County (NAD83 New Mexico East)

Sec 08-T23S-R32E

Alley Cat 17-20 Fed Com 526H

Wellbore #1

Permit Plan 1

Anticollision Report

04 December, 2018

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

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

Survey Tool Program		Date	12/4/2018		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	20,055.16	Permit Plan 1 (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
Offset Well - Wellbore - Design						
Sec 08-T23S-R32E						
Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore	4,467.30	4,463.95	302.18	270.99	9.689	CC
Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore	4,550.00	4,544.84	302.58	270.79	9.519	ES
Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore	20,055.16	21,426.97	1,173.84	956.70	5.406	SF
Alley Cat 17-20 Fed Com 216H - Wellbore #1 - Wellbore	992.88	997.61	803.88	797.21	120.449	CC
Alley Cat 17-20 Fed Com 216H - Wellbore #1 - Wellbore	2,300.00	2,299.12	811.09	795.22	51.085	ES
Alley Cat 17-20 Fed Com 216H - Wellbore #1 - Wellbore	5,950.00	5,816.47	1,466.58	1,425.55	35.746	SF
Alley Cat 17-20 Fed Com 524H - Wellbore #1 - Permit PI	2,700.00	2,700.00	59.96	41.03	3.167	Alert, CC, ES
Alley Cat 17-20 Fed Com 524H - Wellbore #1 - Permit PI	2,750.00	2,749.22	60.50	41.22	3.138	Alert, SF
Alley Cat 17-20 Fed Com 525H - Wellbore #1 - Permit PI	2,700.00	2,700.30	29.97	11.03	1.583	Minor Risk, CC
Alley Cat 17-20 Fed Com 525H - Wellbore #1 - Permit PI	2,750.00	2,749.70	30.19	10.90	1.565	Minor Risk, ES, SF
Stray Cat 8 FED COM 1H - Original Hole - Actuals						Out of range
Stray Cat 8-5 Fed Com 213H - Original Hole - Original H	798.17	802.18	834.83	829.71	163.032	CC
Stray Cat 8-5 Fed Com 213H - Original Hole - Original H	2,750.00	2,753.64	838.16	819.27	44.374	ES
Stray Cat 8-5 Fed Com 213H - Original Hole - Original H	7,950.00	7,919.78	1,494.01	1,437.28	26.333	SF
Sec 17-T23S-R32E						
Sharbro Fed #2 (Active) - Wellbore #1 - Wellbore #1	11,848.14	8,710.00	824.04	730.93	8.850	CC
Sharbro Fed #2 (Active) - Wellbore #1 - Wellbore #1	11,850.00	8,710.00	824.05	730.93	8.850	ES
Sharbro Fed #2 (Active) - Wellbore #1 - Wellbore #1	12,500.00	8,710.00	1,050.70	892.80	6.654	SF
Sharbro Fed #3 (Active) - Wellbore #1 - Wellbore #1						Out of range
Sharbro Fed #4 (Active) - Wellbore #1 - Wellbore #1						Out of range
Sharbro Fed #5 (Active) - Wellbore #1 - Wellbore #1	9,127.58	9,082.71	1,257.00	1,025.66	5.433	SF
Sharbro Fed #5 (Active) - Wellbore #1 - Wellbore #1	10,528.33	8,729.00	792.50	703.72	8.927	CC, ES
Tomcat 17 Fed #02 (Active) - Wellbore #1 - Wellbore #1						Out of range
Tomcat 17 Fed #03 (Active) - Wellbore #1 - Wellbore #1	12,833.46	8,874.00	684.66	570.24	5.984	CC, ES
Tomcat 17 Fed #03 (Active) - Wellbore #1 - Wellbore #1	13,300.00	8,874.00	828.50	666.83	5.125	SF
Tomcat 17 Fed #04 (Active) - Wellbore #1 - Wellbore #1						Out of range

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Summary

Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec 20-T23S-R32E						
APJ Fed #008 (Active) - Wellbore #1 - Wellbore #1	19,763.70	8,750.00	1,461.84	1,162.93	4.891	Alert, CC, ES
APJ Fed #008 (Active) - Wellbore #1 - Wellbore #1	19,800.00	8,750.00	1,462.29	1,163.15	4.888	Alert, SF
Tomcat 20 Fed #002 (Active) - Wellbore #1 - Wellbore #1						Out of range
Tomcat 20 Fed #01 (Active) - Wellbore #1 - Wellbore #1	15,374.55	8,850.00	661.91	555.02	6.192	CC
Tomcat 20 Fed #01 (Active) - Wellbore #1 - Wellbore #1	15,400.00	8,850.00	662.40	555.01	6.168	ES
Tomcat 20 Fed #01 (Active) - Wellbore #1 - Wellbore #1	15,850.00	8,850.00	814.97	646.46	4.836	Alert, SF
Tomcat 20 Fed #03 (Active) - Wellbore #1 - Wellbore #1	16,794.25	8,600.00	945.77	823.92	7.762	CC
Tomcat 20 Fed #03 (Active) - Wellbore #1 - Wellbore #1	16,800.00	8,600.00	945.79	823.91	7.760	ES
Tomcat 20 Fed #03 (Active) - Wellbore #1 - Wellbore #1	17,400.00	8,600.00	1,123.13	952.89	6.597	SF
Tomcat 20 Fed #04 (Active) - Wellbore #1 - Wellbore #1						Out of range
Tomcat 20 Fed #05 (Active) - Wellbore #1 - Wellbore #1	18,109.87	8,655.00	900.14	764.63	6.643	CC, ES
Tomcat 20 Fed #05 (Active) - Wellbore #1 - Wellbore #1	18,650.00	8,655.00	1,049.76	871.76	5.897	SF
Tomcat 20 Fed #06 (Active) - Wellbore #1 - Wellbore #1						Out of range
Tomcat 20 Fed #07 (Active) - Wellbore #1 - Wellbore #1	19,429.67	8,650.00	916.91	771.88	6.322	CC, ES
Tomcat 20 Fed #07 (Active) - Wellbore #1 - Wellbore #1	19,900.00	8,650.00	1,030.50	850.39	5.722	SF

Offset Design												Offset Site Error:	0.00 ft
Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore #1												Offset Well Error:	0.50 ft
Survey Program: 147-MWD+HDCM													
Reference Measured Depth (ft)	Vertical Depth (ft)	Offset Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	10.39	10.39	0.50	0.50	35.15	298.32	210.08	364.87				
50.00	50.00	59.88	59.88	0.50	0.51	35.16	298.32	210.17	364.92	363.91	1.01	361.369	
100.00	100.00	109.37	109.37	0.52	0.53	35.19	298.33	210.38	365.04	364.00	1.04	349.848	
150.00	150.00	158.92	158.92	0.59	0.56	35.23	298.34	210.68	365.23	364.07	1.15	316.442	
200.00	200.00	208.68	208.67	0.70	0.67	35.28	298.35	211.06	365.46	364.09	1.37	267.221	
250.00	250.00	258.43	258.42	0.84	0.79	35.33	298.37	211.49	365.73	364.10	1.63	224.044	
300.00	300.00	308.16	308.15	0.99	0.94	35.39	298.40	211.96	366.03	364.10	1.93	189.908	
350.00	350.00	358.05	358.04	1.15	1.10	35.45	298.45	212.48	366.36	364.12	2.24	163.463	
400.00	400.00	408.07	408.06	1.31	1.26	35.51	298.48	213.00	366.70	364.13	2.57	142.840	
450.00	450.00	458.13	458.11	1.48	1.42	35.58	298.52	213.52	367.03	364.13	2.90	126.517	
500.00	500.00	508.21	508.19	1.65	1.59	35.64	298.54	214.05	367.35	364.11	3.24	113.370	
550.00	550.00	558.02	558.00	1.82	1.78	35.71	298.55	214.59	367.67	364.09	3.58	102.632	
600.00	600.00	607.79	607.76	1.99	1.94	35.78	298.56	215.17	368.03	364.10	3.93	93.710	
650.00	650.00	657.57	657.54	2.16	2.11	35.86	298.58	215.80	368.42	364.14	4.27	86.191	
700.00	700.00	707.37	707.34	2.34	2.28	35.94	298.60	216.48	368.83	364.21	4.62	79.779	
750.00	750.00	757.32	757.28	2.51	2.46	36.03	298.63	217.18	369.27	364.29	4.97	74.241	
800.00	800.00	807.28	807.24	2.69	2.64	36.11	298.67	217.87	369.70	364.38	5.33	69.420	
850.00	850.00	857.26	857.21	2.87	2.81	36.19	298.71	218.57	370.15	364.47	5.68	65.187	
900.00	900.00	907.39	907.34	3.04	2.99	36.28	298.75	219.26	370.59	364.55	6.03	61.436	
950.00	950.00	957.70	957.64	3.22	3.17	36.35	298.81	219.86	370.99	364.61	6.39	58.084	
1,000.00	1,000.00	1,007.81	1,007.75	3.40	3.34	36.40	298.89	220.39	371.37	364.62	6.74	55.083	
1,050.00	1,050.00	1,058.13	1,058.07	3.58	3.52	36.46	298.96	220.91	371.73	364.63	7.10	52.373	
1,100.00	1,100.00	1,108.81	1,108.85	3.75	3.70	36.52	298.95	221.39	372.00	364.55	7.46	49.897	
1,150.00	1,150.00	1,159.70	1,159.63	3.93	3.88	36.59	298.84	221.83	372.17	364.36	7.81	47.633	
1,200.00	1,200.00	1,210.07	1,210.00	4.11	4.06	36.65	298.68	222.20	372.27	364.10	8.17	45.569	
1,250.00	1,250.00	1,260.48	1,260.41	4.29	4.24	36.70	298.49	222.52	372.31	363.78	8.53	43.671	
1,300.00	1,300.00	1,310.92	1,310.85	4.46	4.42	36.75	298.29	222.75	372.29	363.41	8.88	41.923	
1,350.00	1,350.00	1,361.24	1,361.17	4.64	4.59	36.79	298.08	222.91	372.22	362.98	9.23	40.308	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 147-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		
1,400.00	1,400.00	1,411.40	1,411.33	4.82	4.77	36.82	297.89	223.00	372.12	362.53	9.59	38.818		
1,450.00	1,450.00	1,461.81	1,461.74	5.00	4.94	36.84	297.71	223.02	371.98	362.05	9.94	37.438		
1,500.00	1,500.00	1,512.39	1,512.31	5.18	5.11	36.85	297.51	222.94	371.78	361.49	10.29	36.144		
1,550.00	1,550.00	1,562.46	1,562.39	5.36	5.28	36.85	297.31	222.78	371.52	360.89	10.63	34.945		
1,600.00	1,600.00	1,612.38	1,612.31	5.53	5.44	36.84	297.14	222.59	371.27	360.30	10.98	33.826		
1,650.00	1,650.00	1,662.35	1,662.28	5.71	5.61	36.82	297.01	222.37	371.03	359.71	11.32	32.774		
1,700.00	1,700.00	1,712.43	1,712.36	5.89	5.78	36.81	296.86	222.15	370.79	359.12	11.67	31.781		
1,750.00	1,750.00	1,762.34	1,762.27	6.07	5.94	36.80	296.70	221.96	370.54	358.52	12.01	30.843		
1,800.00	1,800.00	1,812.02	1,811.94	6.25	6.11	36.80	296.53	221.82	370.32	357.96	12.36	29.959		
1,850.00	1,850.00	1,861.85	1,861.78	6.43	6.28	36.80	296.39	221.71	370.14	357.43	12.71	29.124		
1,900.00	1,900.00	1,911.83	1,911.75	6.61	6.45	36.80	296.26	221.59	369.97	356.91	13.06	28.332		
1,950.00	1,950.00	1,961.80	1,961.73	6.78	6.62	36.79	296.16	221.46	369.80	356.40	13.41	27.582		
2,000.00	2,000.00	2,011.78	2,011.71	6.96	6.79	36.78	296.06	221.31	369.64	355.88	13.76	26.871		
2,050.00	2,050.00	2,061.53	2,061.46	7.14	6.96	36.77	295.98	221.18	369.49	355.38	14.10	26.196		
2,100.00	2,100.00	2,111.22	2,111.14	7.32	7.13	36.76	295.92	221.08	369.38	354.93	14.45	25.556		
2,150.00	2,150.00	2,161.07	2,160.99	7.50	7.30	36.76	295.88	221.00	369.31	354.50	14.80	24.949		
2,200.00	2,200.00	2,210.94	2,210.87	7.68	7.47	36.75	295.87	220.92	369.25	354.10	15.15	24.370		
2,250.00	2,250.00	2,261.02	2,260.95	7.86	7.64	36.74	295.87	220.83	369.19	353.69	15.50	23.817		
2,300.00	2,300.00	2,311.11	2,311.03	8.04	7.82	36.73	295.85	220.75	369.13	353.28	15.85	23.287		
2,350.00	2,350.00	2,361.01	2,360.93	8.22	7.99	36.72	295.83	220.66	369.06	352.86	16.20	22.779		
2,400.00	2,400.00	2,411.03	2,410.95	8.39	8.16	36.71	295.83	220.57	369.01	352.46	16.55	22.294		
2,450.00	2,450.00	2,461.39	2,461.31	8.57	8.33	36.70	295.81	220.45	368.92	352.02	16.90	21.824		
2,500.00	2,500.00	2,511.65	2,511.57	8.75	8.51	36.68	295.76	220.30	368.79	351.53	17.26	21.371		
2,550.00	2,550.00	2,561.72	2,561.64	8.93	8.68	36.67	295.69	220.14	368.64	351.03	17.61	20.934		
2,600.00	2,600.00	2,611.75	2,611.67	9.11	8.85	36.66	295.61	219.98	368.48	350.52	17.96	20.514		
2,650.00	2,650.00	2,661.73	2,661.65	9.29	9.03	36.64	295.53	219.83	368.33	350.01	18.32	20.110		
2,700.00	2,700.00	2,711.97	2,711.89	9.47	9.20	36.63	295.44	219.67	368.16	349.49	18.67	19.720		
2,750.00	2,750.00	2,762.38	2,762.30	9.64	9.38	-56.95	295.27	219.53	367.82	348.80	19.02	19.339		
2,800.00	2,799.99	2,812.49	2,812.41	9.82	9.55	-57.04	295.06	219.39	367.21	347.84	19.37	18.957		
2,850.00	2,849.98	2,862.47	2,862.39	9.99	9.73	-57.19	294.85	219.22	366.36	346.64	19.72	18.582		
2,900.00	2,899.96	2,912.43	2,912.35	10.16	9.91	-57.41	294.67	219.04	365.27	345.21	20.06	18.207		
2,950.00	2,949.92	2,962.38	2,962.30	10.33	10.08	-57.69	294.48	218.86	363.96	343.55	20.41	17.834		
3,000.00	2,999.86	3,012.88	3,012.80	10.50	10.26	-58.03	294.28	218.62	362.39	341.63	20.76	17.459		
3,050.00	3,049.78	3,063.42	3,063.33	10.67	10.44	-58.46	294.05	218.28	360.52	339.41	21.11	17.082		
3,100.00	3,099.68	3,114.37	3,114.28	10.84	10.62	-58.97	293.78	217.79	358.32	336.86	21.46	16.701		
3,150.00	3,149.54	3,164.83	3,164.74	11.02	10.79	-59.57	293.46	217.12	355.78	333.98	21.80	16.317		
3,200.00	3,199.37	3,214.12	3,214.02	11.19	10.97	-60.25	293.22	216.36	353.07	330.92	22.15	15.940		
3,250.00	3,249.16	3,262.72	3,262.62	11.36	11.13	-61.00	293.13	215.56	350.29	327.79	22.49	15.572		
3,300.00	3,298.90	3,310.29	3,310.18	11.54	11.30	-61.78	293.12	215.10	347.61	324.78	22.83	15.224		
3,350.00	3,348.61	3,358.58	3,358.47	11.72	11.47	-62.59	293.19	215.03	345.08	321.90	23.18	14.890		
3,400.00	3,398.26	3,407.89	3,407.78	11.89	11.64	-63.45	293.23	215.19	342.52	319.00	23.52	14.562		
3,450.00	3,447.86	3,457.64	3,457.53	12.07	11.81	-64.38	293.23	215.49	339.88	316.01	23.87	14.238		
3,500.00	3,497.40	3,507.79	3,507.68	12.25	11.98	-65.42	293.22	215.65	337.07	312.85	24.22	13.916		
3,550.00	3,546.89	3,557.21	3,557.10	12.43	12.15	-66.55	293.23	215.68	334.15	309.57	24.57	13.598		
3,600.00	3,596.30	3,606.19	3,606.08	12.61	12.32	-67.75	293.27	215.78	331.24	306.32	24.92	13.280		
3,650.00	3,645.68	3,655.26	3,655.14	12.79	12.49	-68.97	293.33	215.95	328.45	303.17	25.28	12.994		
3,700.00	3,695.06	3,704.40	3,704.29	12.97	12.66	-70.21	293.40	216.22	325.86	300.23	25.63	12.715		
3,750.00	3,744.44	3,753.31	3,753.19	13.16	12.83	-71.43	293.48	216.61	323.48	297.50	25.98	12.450		
3,800.00	3,793.82	3,802.20	3,802.08	13.34	13.00	-72.65	293.59	217.17	321.35	295.01	26.34	12.201		
3,850.00	3,843.20	3,852.15	3,852.03	13.53	13.18	-73.87	293.64	217.92	319.38	292.68	26.70	11.963		
3,900.00	3,892.58	3,902.33	3,902.20	13.71	13.35	-75.07	293.53	218.86	317.46	290.40	27.06	11.732		
3,950.00	3,941.96	3,953.89	3,953.75	13.90	13.53	-76.31	293.18	219.84	315.46	288.03	27.43	11.502		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 147-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		
4,000.00	3,991.34	4,005.43	4,005.28	14.09	13.72	-77.57	292.52	220.66	313.28	285.49	27.79	11.271		
4,050.00	4,040.72	4,053.46	4,053.30	14.27	13.88	-78.83	292.01	221.06	311.25	283.10	28.15	11.056		
4,100.00	4,090.10	4,101.93	4,101.77	14.46	14.06	-80.21	291.77	221.01	309.54	281.03	28.51	10.856		
4,150.00	4,139.48	4,150.76	4,150.60	14.65	14.23	-81.64	291.66	220.86	308.14	279.27	28.87	10.672		
4,200.00	4,188.86	4,200.26	4,200.10	14.84	14.40	-83.09	291.60	220.78	307.01	277.77	29.24	10.501		
4,250.00	4,238.24	4,251.40	4,251.24	15.03	14.58	-84.53	291.28	221.03	305.89	276.28	29.61	10.332		
4,300.00	4,287.61	4,301.95	4,301.78	15.22	14.76	-85.88	290.65	221.63	304.68	274.71	29.97	10.165		
4,350.00	4,336.99	4,351.65	4,351.47	15.41	14.93	-87.24	289.95	222.13	303.57	273.23	30.34	10.005		
4,400.00	4,386.37	4,400.08	4,399.90	15.61	15.10	-88.62	289.32	222.43	302.65	271.95	30.71	9.857		
4,450.00	4,435.75	4,447.54	4,447.36	15.80	15.27	-90.01	288.99	222.48	302.21	271.14	31.07	9.728		
4,467.30	4,452.84	4,463.95	4,463.76	15.87	15.33	-90.51	288.95	222.45	302.18	270.99	31.19	9.689 CC		
4,500.00	4,485.13	4,495.87	4,495.68	15.99	15.44	-91.48	288.93	222.34	302.25	270.82	31.43	9.618		
4,550.00	4,534.51	4,544.84	4,544.65	16.19	15.61	-92.96	288.96	222.18	302.58	270.79	31.79	9.519 ES		
4,600.00	4,583.89	4,594.32	4,594.13	16.38	15.78	-94.46	289.02	222.03	303.16	271.01	32.15	9.429		
4,650.00	4,633.27	4,644.07	4,643.88	16.57	15.95	-95.96	289.03	221.87	303.90	271.38	32.51	9.346		
4,700.00	4,682.65	4,693.65	4,693.46	16.77	16.12	-97.45	288.98	221.70	304.78	271.91	32.88	9.270		
4,750.00	4,732.03	4,743.17	4,742.99	16.96	16.30	-98.92	288.91	221.55	305.85	272.61	33.24	9.200		
4,800.00	4,781.41	4,792.38	4,792.19	17.16	16.47	-100.37	288.83	221.42	307.12	273.51	33.61	9.139		
4,850.00	4,830.79	4,841.54	4,841.36	17.35	16.64	-101.80	288.79	221.31	308.62	274.65	33.97	9.085		
4,900.00	4,880.17	4,890.87	4,890.69	17.55	16.81	-103.22	288.77	221.25	310.33	276.00	34.33	9.039		
4,950.00	4,929.55	4,940.24	4,940.05	17.75	16.99	-104.61	288.77	221.23	312.24	277.55	34.69	9.000		
5,000.00	4,978.93	4,989.91	4,989.72	17.94	17.16	-105.98	288.74	221.24	314.32	279.26	35.06	8.966		
5,050.00	5,028.30	5,039.58	5,039.40	18.14	17.34	-107.34	288.68	221.25	316.52	281.10	35.42	8.936		
5,100.00	5,077.68	5,088.79	5,088.61	18.34	17.51	-108.67	288.61	221.29	318.90	283.12	35.78	8.913		
5,150.00	5,127.06	5,138.01	5,137.83	18.54	17.68	-109.96	288.57	221.37	321.47	285.33	36.14	8.895		
5,200.00	5,176.44	5,187.06	5,186.88	18.73	17.85	-111.23	288.59	221.47	324.25	287.75	36.50	8.884		
5,250.00	5,225.82	5,236.23	5,236.05	18.93	18.02	-112.46	288.67	221.61	327.24	290.38	36.85	8.879		
5,300.00	5,275.20	5,285.65	5,285.47	19.13	18.19	-113.68	288.76	221.75	330.39	293.18	37.21	8.879		
5,350.00	5,324.58	5,335.00	5,334.81	19.33	18.36	-114.87	288.85	221.90	333.68	296.12	37.56	8.883		
5,400.00	5,373.96	5,384.22	5,384.03	19.53	18.53	-116.04	288.96	222.03	337.15	299.23	37.92	8.891		
5,450.00	5,423.34	5,433.50	5,433.31	19.73	18.70	-117.19	289.09	222.14	340.77	302.50	38.27	8.904		
5,500.00	5,472.72	5,482.84	5,482.65	19.93	18.87	-118.31	289.22	222.25	344.55	305.92	38.63	8.920		
5,550.00	5,522.10	5,532.52	5,532.33	20.13	19.05	-119.42	289.36	222.36	348.44	309.46	38.98	8.939		
5,600.00	5,571.48	5,582.47	5,582.28	20.33	19.22	-120.50	289.45	222.55	352.40	313.06	39.34	8.958		
5,650.00	5,620.86	5,631.72	5,631.53	20.53	19.39	-121.54	289.52	222.78	356.44	316.75	39.69	8.980		
5,700.00	5,670.24	5,680.82	5,680.43	20.73	19.56	-122.55	289.62	222.95	360.65	320.81	40.04	9.007		
5,750.00	5,719.61	5,729.92	5,729.73	20.93	19.73	-123.55	289.75	223.06	365.03	324.63	40.39	9.037		
5,800.00	5,768.99	5,779.35	5,779.16	21.13	19.90	-124.54	289.87	223.18	369.51	328.76	40.75	9.069		
5,850.00	5,818.37	5,828.70	5,828.51	21.33	20.07	-125.49	290.00	223.30	374.10	333.00	41.10	9.103		
5,900.00	5,867.75	5,878.04	5,877.85	21.53	20.25	-126.43	290.13	223.41	378.80	337.35	41.45	9.139		
5,950.00	5,917.13	5,927.76	5,927.57	21.73	20.42	-127.35	290.25	223.53	383.58	341.78	41.80	9.176		
6,000.00	5,966.51	5,977.50	5,977.31	21.94	20.59	-128.24	290.33	223.68	388.42	346.26	42.16	9.214		
6,050.00	6,015.89	6,026.28	6,026.08	22.14	20.76	-129.10	290.43	223.81	393.37	350.86	42.51	9.255		
6,100.00	6,065.27	6,075.24	6,075.04	22.34	20.93	-129.94	290.57	223.88	398.48	355.62	42.85	9.298		
6,150.00	6,114.65	6,125.04	6,124.85	22.54	21.10	-130.78	290.71	223.97	403.66	360.46	43.21	9.342		
6,200.00	6,164.03	6,174.77	6,174.58	22.74	21.28	-131.59	290.83	224.09	408.88	365.32	43.56	9.387		
6,250.00	6,213.41	6,224.24	6,224.05	22.95	21.45	-132.38	290.90	224.21	414.16	370.25	43.91	9.432		
6,300.00	6,262.79	6,273.63	6,273.44	23.15	21.62	-133.15	290.95	224.29	419.51	375.25	44.26	9.478		
6,350.00	6,312.17	6,322.87	6,322.68	23.35	21.79	-133.90	291.02	224.39	424.94	380.33	44.61	9.525		
6,400.00	6,361.55	6,372.26	6,372.07	23.56	21.97	-134.63	291.13	224.51	430.46	385.50	44.96	9.573		
6,450.00	6,410.93	6,421.82	6,421.63	23.76	22.14	-135.34	291.20	224.61	436.04	390.72	45.32	9.622		
6,500.00	6,460.30	6,471.59	6,471.39	23.96	22.31	-136.05	291.23	224.70	441.65	395.98	45.67	9.670		

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

Anticollision Report

Company:	WCDCS Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 147-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)	Separation (ft)	Factor		
6,550.00	6,509.68	6,521.53	6,521.33	24.17	22.49	-136.74	291.22	224.83	447.27	401.25	46.03	9.718		
6,600.00	6,559.06	6,571.47	6,571.28	24.37	22.87	-137.41	291.16	225.00	452.90	406.52	46.38	9.765		
6,650.00	6,608.44	6,621.42	6,621.23	24.57	22.84	-138.08	291.03	225.18	458.53	411.79	46.74	9.811		
6,700.00	6,657.82	6,670.81	6,670.62	24.78	23.02	-138.72	290.84	225.34	464.18	417.09	47.09	9.858		
6,750.00	6,707.20	6,720.04	6,719.84	24.98	23.19	-139.36	290.61	225.45	469.80	422.46	47.44	9.905		
6,800.00	6,756.58	6,769.88	6,769.67	25.18	23.36	-140.00	290.32	225.51	475.68	427.88	47.79	9.953		
6,850.00	6,805.96	6,819.77	6,819.58	25.39	23.54	-140.63	289.94	225.56	481.45	433.31	48.15	10.000		
6,900.00	6,855.34	6,869.73	6,869.54	25.59	23.72	-141.25	289.48	225.62	487.23	438.73	48.50	10.046		
6,950.00	6,904.72	6,919.71	6,919.51	25.80	23.89	-141.86	288.99	225.73	493.01	444.15	48.86	10.091		
7,000.00	6,954.10	6,969.27	6,969.07	26.00	24.07	-142.47	288.39	225.79	498.80	449.59	49.21	10.137		
7,050.00	7,003.48	7,018.76	7,018.55	26.21	24.24	-143.07	287.66	225.76	504.63	455.07	49.56	10.182		
7,100.00	7,052.86	7,067.92	7,067.71	26.41	24.41	-143.67	286.93	225.70	510.52	460.81	49.91	10.229		
7,150.00	7,102.24	7,116.89	7,116.67	26.61	24.58	-144.24	286.24	225.66	516.49	466.23	50.26	10.277		
7,200.00	7,151.62	7,165.39	7,165.16	26.82	24.75	-144.79	285.60	225.57	522.58	471.97	50.60	10.327		
7,250.00	7,200.99	7,214.03	7,213.80	27.02	24.93	-145.33	285.02	225.42	528.79	477.84	50.95	10.379		
7,300.00	7,250.37	7,262.94	7,262.71	27.23	25.10	-145.87	284.42	225.20	535.11	483.81	51.30	10.432		
7,350.00	7,299.75	7,311.91	7,311.67	27.43	25.27	-146.40	283.81	224.92	541.50	489.86	51.64	10.485		
7,400.00	7,349.13	7,360.97	7,360.72	27.64	25.44	-146.92	283.20	224.60	547.97	495.98	51.99	10.540		
7,450.00	7,398.51	7,410.74	7,410.50	27.84	25.62	-147.43	282.61	224.30	554.50	502.15	52.35	10.593		
7,500.00	7,447.89	7,461.22	7,460.97	28.05	25.79	-147.92	282.15	224.19	560.98	508.27	52.70	10.644		
7,550.00	7,497.27	7,512.05	7,511.79	28.26	25.97	-148.37	281.81	224.31	567.38	514.32	53.06	10.692		
7,600.00	7,546.65	7,563.07	7,562.82	28.46	26.15	-148.79	281.53	224.65	573.69	520.26	53.43	10.738		
7,650.00	7,596.03	7,613.68	7,613.43	28.67	26.33	-149.20	281.28	225.15	579.90	526.11	53.79	10.781		
7,700.00	7,645.41	7,664.22	7,663.96	28.87	26.51	-149.59	281.00	225.74	586.04	531.89	54.15	10.823		
7,750.00	7,694.79	7,713.24	7,712.97	29.08	26.68	-149.96	280.69	226.32	592.18	537.68	54.50	10.866		
7,800.00	7,744.17	7,762.20	7,761.93	29.28	26.86	-150.34	280.33	226.82	598.39	543.54	54.85	10.909		
7,850.00	7,793.55	7,811.85	7,811.38	29.49	27.03	-150.71	279.95	227.29	604.64	549.44	55.21	10.953		
7,900.00	7,842.93	7,861.15	7,860.87	29.70	27.21	-151.08	279.56	227.75	610.92	555.36	55.56	10.996		
7,950.00	7,892.31	7,910.98	7,910.70	29.90	27.38	-151.44	279.12	228.21	617.21	561.29	55.92	11.038		
8,000.00	7,941.69	7,960.84	7,960.55	30.11	27.56	-151.82	278.60	228.66	623.48	567.20	56.27	11.079		
8,050.00	7,991.14	8,010.83	8,010.54	30.31	27.74	-152.20	278.03	229.12	629.35	572.72	56.63	11.113		
8,100.00	8,040.68	8,061.15	8,060.86	30.51	27.91	-152.55	277.40	229.60	634.62	577.63	56.99	11.136		
8,150.00	8,090.30	8,111.95	8,111.64	30.71	28.09	-152.87	276.70	230.13	639.25	581.90	57.35	11.147		
8,200.00	8,140.00	8,162.84	8,162.32	30.90	28.27	-153.16	275.92	230.72	643.23	585.53	57.71	11.147		
8,250.00	8,189.77	8,213.22	8,212.90	31.09	28.45	-153.42	275.03	231.31	646.58	588.52	58.06	11.136		
8,300.00	8,239.60	8,263.61	8,263.28	31.28	28.63	-153.65	274.05	231.91	649.31	590.89	58.42	11.115		
8,350.00	8,289.47	8,313.93	8,313.58	31.46	28.81	-153.85	273.02	232.51	651.42	592.65	58.77	11.084		
8,400.00	8,339.39	8,363.12	8,362.75	31.64	28.98	-154.03	271.98	233.07	652.96	593.84	59.12	11.044		
8,450.00	8,389.34	8,412.04	8,411.66	31.82	29.16	-154.17	270.95	233.55	653.99	594.52	59.47	10.998		
8,500.00	8,439.32	8,460.33	8,459.94	31.99	29.33	-154.28	270.03	233.97	654.53	594.73	59.81	10.944		
8,550.00	8,489.31	8,508.54	8,508.15	32.16	29.50	-154.35	269.34	234.36	654.63	594.48	60.14	10.884		
8,600.00	8,539.31	8,558.62	8,558.22	32.33	29.67	-60.84	268.74	234.65	654.28	593.80	60.48	10.818		
8,650.00	8,589.31	8,604.68	8,604.27	32.49	29.84	-60.89	268.04	234.72	653.86	593.05	60.81	10.752		
8,700.00	8,639.31	8,651.50	8,651.09	32.65	30.01	-60.97	267.23	234.50	653.64	592.50	61.14	10.691		
8,750.00	8,689.31	8,701.70	8,701.27	32.82	30.18	-61.06	266.26	234.04	653.57	592.09	61.48	10.630		
8,800.00	8,739.31	8,753.14	8,752.70	32.98	30.36	-61.14	265.39	233.76	653.41	591.57	61.84	10.567		
8,838.45	8,775.76	8,786.69	8,786.26	33.10	30.48	-61.17	265.00	233.64	653.31	591.24	62.07	10.526		
8,850.00	8,789.31	8,798.96	8,798.52	33.15	30.52	-61.18	264.94	233.60	653.32	591.17	62.15	10.511		
8,900.00	8,839.31	8,844.19	8,843.75	33.31	30.68	-61.17	265.12	233.40	653.61	591.14	62.46	10.464		
8,950.00	8,889.31	8,892.66	8,892.22	33.47	30.85	-61.23	265.81	233.18	654.17	591.38	62.80	10.418		
9,000.00	8,939.22	8,941.66	8,941.21	33.63	31.01	-61.33	266.71	232.99	656.16	593.04	63.13	10.394		
9,050.00	8,988.69	8,995.09	8,994.63	33.79	31.20	-61.61	267.54	232.83	660.23	596.73	63.49	10.398		

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 Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore #1											Offset Site Error: 0.00 ft		
Survey Program: 147-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 Tooface (")	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
9,100.00	9,037.34	9,048.32	9,047.86	33.95	31.38	120.02	267.72	232.73	666.21	602.35	63.86	10.432	
9,150.00	9,084.82	9,096.34	9,095.88	34.10	31.55	120.42	267.65	232.68	674.39	610.19	64.20	10.505	
9,200.00	9,130.75	9,143.41	9,142.95	34.25	31.71	120.85	267.51	232.68	684.99	620.46	64.53	10.615	
9,250.00	9,174.79	9,186.30	9,185.84	34.39	31.86	121.16	267.46	232.71	698.26	633.42	64.84	10.769	
9,300.00	9,216.60	9,227.24	9,226.78	34.53	32.01	121.36	267.52	232.77	714.35	649.22	65.13	10.967	
9,350.00	9,255.87	9,262.41	9,261.95	34.66	32.13	121.19	267.71	232.77	733.47	668.08	65.39	11.217	
9,400.00	9,292.29	9,294.68	9,294.22	34.79	32.24	120.70	268.03	232.68	755.74	690.12	65.62	11.516	
9,450.00	9,325.59	9,323.91	9,323.44	34.91	32.34	119.80	268.45	232.51	781.11	715.28	65.83	11.865	
9,500.00	9,355.51	9,350.54	9,350.07	35.03	32.43	118.43	268.90	232.28	809.47	743.45	66.02	12.261	
9,550.00	9,381.83	9,373.73	9,373.26	35.15	32.51	116.44	269.33	232.02	840.64	774.45	66.18	12.702	
9,600.00	9,404.35	9,393.33	9,392.84	35.28	32.58	113.73	269.72	231.75	874.39	808.08	66.32	13.185	
9,650.00	9,422.89	9,409.19	9,408.71	35.40	32.63	110.17	270.06	231.50	910.47	844.04	66.42	13.707	
9,700.00	9,437.31	9,421.52	9,421.03	35.54	32.67	105.64	270.33	231.29	948.54	882.03	66.50	14.263	
9,750.00	9,447.51	9,430.18	9,429.68	35.69	32.70	100.07	270.51	231.13	988.25	921.69	66.56	14.848	
9,800.00	9,453.41	9,434.74	9,434.25	35.85	32.72	93.41	270.61	231.04	1,029.25	962.66	66.59	15.458	
9,850.00	9,455.00	9,435.23	9,434.73	36.02	32.72	86.93	270.62	231.03	1,071.13	1,004.54	66.59	16.086	
9,900.00	9,455.00	9,434.19	9,433.70	36.20	32.72	86.82	270.60	231.05	1,113.88	1,047.09	66.59	16.726	
9,950.00	9,455.00	9,433.16	9,432.66	36.40	32.71	86.72	270.58	231.07	1,156.82	1,090.23	66.59	17.373	
10,000.00	9,455.00	11,337.08	10,544.56	36.60	39.99	154.93	-763.86	305.70	1,191.48	1,141.39	50.09	23.785	
10,050.00	9,455.00	11,384.34	10,545.32	36.83	40.27	154.93	-811.11	305.68	1,192.36	1,141.91	50.44	23.638	
10,100.00	9,455.00	11,431.13	10,546.15	37.06	40.56	154.93	-857.90	305.54	1,193.36	1,142.57	50.79	23.495	
10,150.00	9,455.00	11,475.24	10,547.03	37.32	40.84	154.92	-901.99	305.26	1,194.53	1,143.37	51.16	23.350	
10,200.00	9,455.00	11,517.96	10,548.05	37.58	41.12	154.91	-944.69	304.76	1,196.00	1,144.48	51.53	23.211	
10,250.00	9,455.00	11,572.71	10,549.42	37.85	41.48	154.88	-999.42	303.81	1,197.65	1,145.67	51.98	23.042	
10,300.00	9,455.00	11,639.18	10,550.18	38.14	41.94	154.82	-1,065.87	302.48	1,198.72	1,146.21	52.51	22.827	
10,350.00	9,455.00	11,684.91	10,550.48	38.44	42.27	154.77	-1,111.59	301.52	1,199.60	1,146.64	52.86	22.649	
10,400.00	9,455.00	11,738.00	10,550.90	38.75	42.65	154.72	-1,164.67	300.44	1,200.53	1,147.07	53.46	22.456	
10,450.00	9,455.00	11,810.66	10,550.89	39.07	43.20	154.67	-1,237.32	299.84	1,200.84	1,146.74	54.11	22.194	
10,500.00	9,455.00	11,861.56	10,550.54	39.40	43.60	154.65	-1,288.23	299.90	1,200.64	1,146.03	54.61	21.987	
10,550.00	9,455.00	11,911.60	10,550.19	39.75	43.99	154.63	-1,338.26	299.92	1,200.45	1,145.33	55.12	21.780	
10,600.00	9,455.00	11,969.42	10,549.50	40.10	44.47	154.60	-1,396.08	299.82	1,200.09	1,144.38	55.70	21.544	
10,650.00	9,455.00	12,022.46	10,548.46	40.47	44.91	154.55	-1,449.11	299.53	1,199.45	1,143.17	56.28	21.311	
10,700.00	9,455.00	12,070.16	10,547.41	40.84	45.31	154.49	-1,496.79	298.99	1,198.85	1,142.01	56.83	21.094	
10,750.00	9,455.00	12,114.54	10,546.44	41.23	45.69	154.43	-1,541.16	298.21	1,198.38	1,141.00	57.37	20.887	
10,795.35	9,455.00	12,152.27	10,545.76	41.58	46.02	154.38	-1,578.86	297.31	1,198.23	1,140.38	57.85	20.712	
10,800.00	9,455.00	12,158.13	10,545.70	41.62	46.05	154.36	-1,582.73	297.21	1,198.23	1,140.33	57.90	20.695	
10,850.00	9,455.00	12,196.79	10,545.19	42.02	46.41	154.28	-1,623.38	296.00	1,198.45	1,140.02	58.43	20.509	
10,900.00	9,455.00	12,235.58	10,545.09	42.43	46.75	154.22	-1,662.13	294.87	1,199.11	1,140.16	58.95	20.341	
10,950.00	9,455.00	12,276.00	10,545.48	42.85	47.11	154.17	-1,702.54	293.82	1,200.23	1,140.75	59.48	20.178	
11,000.00	9,455.00	12,316.80	10,546.28	43.28	47.49	154.14	-1,743.32	292.87	1,201.75	1,141.74	60.02	20.024	
11,050.00	9,455.00	12,359.38	10,547.44	43.72	47.88	154.11	-1,785.88	291.98	1,203.58	1,143.01	60.57	19.872	
11,100.00	9,455.00	12,423.94	10,549.26	44.16	48.49	154.09	-1,850.40	290.94	1,205.36	1,144.05	61.31	19.659	
11,150.00	9,455.00	12,491.96	10,550.27	44.61	49.14	154.07	-1,918.41	290.41	1,206.33	1,144.22	62.11	19.422	
11,200.00	9,455.00	12,556.81	10,550.46	45.06	49.78	154.05	-1,983.27	290.27	1,206.65	1,143.76	62.89	19.186	
11,250.00	9,455.00	12,623.11	10,549.87	45.53	50.43	154.02	-2,049.56	290.46	1,206.33	1,142.62	63.71	18.934	
11,300.00	9,455.00	12,677.86	10,548.88	46.00	50.99	154.01	-2,104.30	290.86	1,205.49	1,141.07	64.42	18.713	
11,350.00	9,455.00	12,727.31	10,548.04	46.48	51.49	154.00	-2,153.74	291.37	1,204.64	1,139.57	65.08	18.512	
11,400.00	9,455.00	12,788.61	10,546.94	46.96	52.11	153.99	-2,213.02	292.19	1,203.65	1,137.81	65.84	18.282	
11,450.00	9,455.00	12,844.79	10,545.42	47.46	52.72	153.99	-2,271.17	293.25	1,202.21	1,135.61	66.60	18.051	
11,500.00	9,455.00	12,896.82	10,543.93	47.95	53.27	153.99	-2,323.18	294.34	1,200.60	1,133.30	67.30	17.840	
11,550.00	9,455.00	12,945.34	10,542.52	48.46	53.79	154.00	-2,371.86	295.43	1,198.95	1,130.98	67.97	17.640	
11,600.00	9,455.00	12,990.82	10,541.37	48.96	54.28	154.00	-2,417.11	296.46	1,197.45	1,128.85	68.60	17.456	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 147-MWD+HDGM													Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N-S (ft)	+E-W (ft)						
11,650.00	9,455.00	13,034.17	10,540.46	49.48	54.75	154.01	-2,460.44	297.43	1,196.16	1,126.95	69.21	17.283		
11,700.00	9,455.00	13,074.87	10,539.87	50.00	55.20	154.02	-2,501.13	298.20	1,195.23	1,125.44	69.79	17.125		
11,750.00	9,455.00	13,116.12	10,539.55	50.53	55.65	154.03	-2,542.37	298.84	1,194.69	1,124.30	70.39	16.972		
11,800.00	9,455.00	13,160.75	10,539.48	51.05	56.15	154.05	-2,587.00	299.51	1,194.43	1,123.40	71.03	16.816		
11,832.42	9,455.00	13,189.69	10,539.57	51.40	56.47	154.06	-2,615.93	299.98	1,194.38	1,122.94	71.44	16.719		
11,850.00	9,455.00	13,206.03	10,539.67	51.59	56.65	154.07	-2,632.28	300.26	1,194.40	1,122.73	71.67	16.666		
11,900.00	9,455.00	13,271.66	10,539.71	52.13	57.39	154.11	-2,697.89	301.58	1,194.12	1,121.58	72.54	16.461		
11,950.00	9,455.00	13,330.14	10,539.14	52.67	58.05	154.15	-2,756.35	303.01	1,193.28	1,119.94	73.34	16.270		
12,000.00	9,455.00	13,383.82	10,538.46	53.22	58.66	154.18	-2,810.00	304.50	1,192.25	1,118.16	74.09	16.093		
12,050.00	9,455.00	13,436.90	10,537.76	53.77	59.28	154.23	-2,863.04	306.26	1,191.07	1,116.25	74.82	15.919		
12,100.00	9,455.00	13,489.84	10,537.16	54.33	59.89	154.30	-2,915.93	308.53	1,189.77	1,114.23	75.54	15.751		
12,150.00	9,455.00	13,536.79	10,538.60	54.89	60.44	154.36	-2,962.84	310.45	1,188.47	1,112.28	76.19	15.598		
12,200.00	9,455.00	13,584.16	10,535.90	55.45	61.00	154.39	-3,010.19	311.90	1,187.29	1,110.42	76.88	15.444		
12,250.00	9,455.00	13,630.90	10,535.22	56.02	61.55	154.42	-3,058.91	313.05	1,186.24	1,108.66	77.57	15.292		
12,300.00	9,455.00	13,677.95	10,534.61	56.59	62.10	154.44	-3,103.94	314.09	1,185.31	1,107.04	78.27	15.143		
12,350.00	9,455.00	13,727.94	10,534.00	57.17	62.70	154.45	-3,153.92	315.13	1,184.45	1,105.43	79.02	14.989		
12,400.00	9,455.00	13,778.35	10,533.38	57.75	63.30	154.47	-3,204.31	316.19	1,183.58	1,103.81	79.77	14.837		
12,450.00	9,455.00	13,830.45	10,532.64	58.33	63.92	154.49	-3,256.40	317.21	1,182.66	1,102.10	80.55	14.682		
12,500.00	9,455.00	13,879.03	10,531.84	58.92	64.51	154.50	-3,304.96	318.07	1,181.67	1,100.37	81.30	14.535		
12,550.00	9,455.00	13,922.18	10,531.33	59.51	65.03	154.51	-3,348.11	318.83	1,180.90	1,098.92	81.98	14.405		
12,600.00	9,455.00	13,965.69	10,531.10	60.10	65.56	154.52	-3,391.61	319.58	1,180.42	1,097.77	82.66	14.281		
12,650.00	9,455.00	14,010.46	10,531.05	60.70	66.10	154.54	-3,436.37	320.26	1,180.19	1,096.83	83.35	14.159		
12,678.38	9,455.00	14,035.87	10,531.09	61.03	66.41	154.55	-3,461.78	320.58	1,180.15	1,096.40	83.75	14.091		
12,700.00	9,455.00	14,055.42	10,531.15	61.29	66.65	154.55	-3,481.33	320.79	1,180.17	1,096.11	84.06	14.040		
12,750.00	9,455.00	14,101.79	10,531.39	61.89	67.21	154.56	-3,527.70	321.22	1,180.34	1,095.55	84.79	13.921		
12,800.00	9,455.00	14,148.46	10,531.74	62.50	67.78	154.57	-3,574.36	321.58	1,180.65	1,095.13	85.52	13.806		
12,850.00	9,455.00	14,198.09	10,532.12	63.10	68.39	154.57	-3,623.99	321.79	1,181.04	1,094.74	86.31	13.684		
12,900.00	9,455.00	14,248.88	10,532.41	63.71	69.02	154.57	-3,674.78	321.78	1,181.45	1,094.32	87.12	13.561		
12,950.00	9,455.00	14,305.15	10,532.39	64.32	69.71	154.54	-3,731.04	321.48	1,181.68	1,093.64	88.04	13.422		
13,000.00	9,455.00	14,357.08	10,532.00	64.94	70.35	154.49	-3,782.97	320.96	1,181.69	1,092.78	88.92	13.290		
13,050.00	9,455.00	14,404.77	10,531.63	65.55	70.94	154.44	-3,830.66	320.33	1,181.76	1,092.02	89.74	13.169		
13,100.00	9,455.00	14,448.05	10,531.38	66.17	71.47	154.40	-3,873.93	319.67	1,181.97	1,091.47	90.50	13.060		
13,150.00	9,455.00	14,487.49	10,531.52	66.79	71.96	154.36	-3,913.36	319.08	1,182.60	1,091.40	91.20	12.967		
13,200.00	9,455.00	14,528.59	10,532.09	67.41	72.48	154.34	-3,954.45	318.49	1,183.66	1,091.76	91.91	12.879		
13,250.00	9,455.00	14,579.12	10,532.91	68.04	73.11	154.31	-4,004.98	317.70	1,184.88	1,092.11	92.77	12.772		
13,300.00	9,455.00	14,631.99	10,533.65	68.68	73.77	154.26	-4,057.83	316.72	1,186.05	1,092.38	93.68	12.661		
13,350.00	9,455.00	14,690.58	10,534.12	69.29	74.50	154.21	-4,116.41	315.64	1,186.95	1,092.26	94.69	12.536		
13,400.00	9,455.00	14,745.15	10,534.22	69.92	75.19	154.16	-4,170.98	314.70	1,187.54	1,091.90	95.64	12.417		
13,450.00	9,455.00	14,797.73	10,534.19	70.56	75.85	154.10	-4,223.55	313.84	1,188.01	1,091.45	96.56	12.303		
13,500.00	9,455.00	14,842.70	10,534.18	71.19	76.42	154.06	-4,268.50	313.08	1,188.52	1,091.15	97.37	12.206		
13,550.00	9,455.00	14,886.62	10,534.35	71.83	76.98	154.01	-4,312.42	312.19	1,189.28	1,091.11	98.17	12.115		
13,600.00	9,455.00	14,947.85	10,534.52	72.48	77.76	153.94	-4,373.63	310.90	1,190.02	1,090.77	99.25	11.990		
13,650.00	9,455.00	15,010.88	10,533.93	73.10	78.56	153.87	-4,436.65	309.83	1,190.10	1,089.73	100.37	11.857		
13,700.00	9,455.00	15,065.77	10,533.03	73.75	79.26	153.79	-4,491.52	308.92	1,189.87	1,088.49	101.37	11.737		
13,750.00	9,455.00	15,116.07	10,532.00	74.39	79.91	153.72	-4,541.81	308.03	1,189.49	1,087.18	102.31	11.626		
13,800.00	9,455.00	15,163.70	10,531.05	75.03	80.52	153.64	-4,589.42	307.05	1,189.19	1,085.97	103.22	11.521		
13,850.00	9,455.00	15,218.13	10,529.96	75.68	81.22	153.56	-4,643.83	305.93	1,188.90	1,084.66	104.24	11.406		
13,900.00	9,455.00	15,276.10	10,528.63	76.33	81.97	153.48	-4,701.78	305.20	1,188.30	1,083.00	105.30	11.285		
13,950.00	9,455.00	15,318.73	10,527.80	76.98	82.52	153.44	-4,744.40	304.93	1,187.70	1,081.60	106.10	11.194		
14,000.00	9,455.00	15,361.91	10,527.33	77.63	83.08	153.41	-4,787.58	304.88	1,187.38	1,080.49	106.89	11.109		
14,050.00	9,455.00	15,410.96	10,527.10	78.28	83.72	153.40	-4,836.62	305.03	1,187.25	1,079.50	107.75	11.019		
14,100.00	9,455.00	15,460.96	10,526.86	78.93	84.38	153.40	-4,886.62	305.37	1,187.12	1,078.50	108.61	10.930		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 147-MWD+HDGM													Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset		+N/-S (ft)	+E/-W (ft)						
14,150.00	9,455.00	15,509.55	10,526.94	79.59	85.02	153.41	-4,935.21	305.88	1,187.02	1,077.57	109.45	10.846		
14,200.00	9,455.00	15,558.12	10,527.05	80.24	85.66	153.42	-4,983.77	306.47	1,186.98	1,076.71	110.27	10.764		
14,203.76	9,455.00	15,561.77	10,527.06	80.29	85.71	153.42	-4,987.42	306.53	1,186.98	1,076.64	110.33	10.758		
14,250.00	9,455.00	15,598.88	10,527.45	80.90	86.20	153.45	-5,024.52	307.18	1,187.17	1,076.21	110.96	10.699		
14,300.00	9,455.00	15,639.94	10,528.32	81.56	86.74	153.50	-5,065.56	308.14	1,187.73	1,076.11	111.62	10.641		
14,350.00	9,455.00	15,695.32	10,529.81	82.22	87.48	153.59	-5,120.90	309.73	1,188.45	1,075.99	112.46	10.567		
14,400.00	9,455.00	15,755.37	10,531.01	82.88	88.29	153.68	-5,180.91	311.66	1,188.77	1,075.40	113.37	10.486		
14,450.00	9,455.00	15,810.73	10,531.69	83.54	89.03	153.75	-5,236.24	313.37	1,188.79	1,074.56	114.22	10.408		
14,500.00	9,455.00	15,863.71	10,532.01	84.20	89.74	153.81	-5,289.20	314.86	1,188.57	1,073.51	115.06	10.330		
14,550.00	9,455.00	15,913.72	10,532.23	84.86	90.41	153.85	-5,339.19	316.16	1,188.33	1,072.47	115.87	10.256		
14,600.00	9,455.00	15,958.03	10,532.44	85.53	91.01	153.89	-5,383.48	317.23	1,188.17	1,071.57	116.60	10.190		
14,600.12	9,455.00	15,958.12	10,532.44	85.53	91.01	153.89	-5,383.58	317.24	1,188.17	1,071.56	116.60	10.190		
14,650.00	9,455.00	15,998.76	10,532.93	86.20	91.55	153.93	-5,424.20	318.13	1,188.36	1,071.08	117.28	10.133		
14,700.00	9,455.00	16,050.80	10,533.86	86.86	92.25	153.98	-5,476.23	319.17	1,188.87	1,070.76	118.11	10.065		
14,750.00	9,455.00	16,128.45	10,534.04	87.53	93.30	154.04	-5,553.85	321.02	1,188.60	1,069.28	119.32	9.961		
14,800.00	9,455.00	16,177.43	10,533.71	88.20	93.96	154.08	-5,602.81	322.39	1,187.82	1,067.69	120.13	9.888		
14,850.00	9,455.00	16,228.22	10,533.36	88.87	94.65	154.13	-5,653.57	323.95	1,188.97	1,066.03	120.95	9.814		
14,900.00	9,455.00	16,277.20	10,533.08	89.54	95.32	154.18	-5,702.53	325.56	1,188.15	1,064.41	121.74	9.743		
14,950.00	9,455.00	16,326.02	10,532.90	90.21	95.98	154.24	-5,751.32	327.24	1,185.36	1,062.84	122.52	9.675		
15,000.00	9,455.00	16,374.54	10,532.80	90.88	96.64	154.30	-5,799.80	328.97	1,184.64	1,061.35	123.29	9.609		
15,050.00	9,455.00	16,423.32	10,532.78	91.56	97.30	154.36	-5,848.55	330.72	1,183.98	1,059.92	124.06	9.544		
15,100.00	9,455.00	16,472.49	10,532.66	92.23	97.87	154.41	-5,897.70	332.20	1,183.35	1,058.50	124.88	9.478		
15,150.00	9,455.00	16,522.42	10,532.38	92.91	98.65	154.43	-5,947.62	333.32	1,182.76	1,057.07	125.69	9.410		
15,200.00	9,455.00	16,573.11	10,531.88	93.58	99.34	154.44	-5,998.30	334.05	1,182.14	1,055.57	126.57	9.340		
15,250.00	9,455.00	16,621.08	10,531.25	94.26	99.99	154.43	-6,046.27	334.39	1,181.53	1,054.09	127.44	9.271		
15,300.00	9,455.00	16,667.45	10,530.74	94.94	100.62	154.42	-6,092.63	334.63	1,181.06	1,052.77	128.29	9.206		
15,350.00	9,455.00	16,717.97	10,530.23	95.61	101.30	154.40	-6,143.15	334.75	1,180.69	1,051.49	129.21	9.138		
15,400.00	9,455.00	16,771.25	10,529.42	96.29	102.03	154.36	-6,196.43	334.59	1,180.21	1,050.01	130.20	9.065		
15,450.00	9,455.00	16,815.79	10,528.66	96.97	102.63	154.32	-6,240.95	334.27	1,179.74	1,048.68	131.07	9.001		
15,500.00	9,455.00	16,858.61	10,528.20	97.65	103.21	154.28	-6,283.77	333.93	1,179.57	1,047.68	131.90	8.943		
15,502.79	9,455.00	16,861.00	10,528.19	97.69	103.24	154.28	-6,286.16	333.91	1,179.57	1,047.63	131.94	8.940		
15,550.00	9,455.00	16,903.99	10,527.96	98.33	103.82	154.24	-6,329.15	333.51	1,179.67	1,046.91	132.76	8.885		
15,600.00	9,455.00	16,950.80	10,527.81	99.02	104.46	154.20	-6,375.95	332.96	1,179.92	1,046.26	133.66	8.828		
15,650.00	9,455.00	16,999.28	10,527.74	99.70	105.11	154.16	-6,424.43	332.32	1,180.28	1,045.68	134.60	8.769		
15,700.00	9,455.00	17,048.74	10,527.76	100.38	105.78	154.12	-6,473.89	331.78	1,180.67	1,045.14	135.53	8.711		
15,750.00	9,455.00	17,095.97	10,527.85	101.07	106.43	154.09	-6,521.11	331.30	1,181.12	1,044.69	136.43	8.657		
15,800.00	9,455.00	17,142.37	10,527.98	101.75	107.08	154.05	-6,567.51	330.60	1,181.72	1,044.39	137.33	8.605		
15,850.00	9,455.00	17,191.23	10,528.19	102.43	107.72	154.00	-6,616.36	329.77	1,182.43	1,044.15	138.28	8.551		
15,900.00	9,455.00	17,241.13	10,528.59	103.12	108.40	153.98	-6,666.26	329.26	1,183.15	1,043.94	139.21	8.499		
15,950.00	9,455.00	17,307.36	10,529.04	103.81	109.31	153.97	-6,732.49	329.30	1,183.59	1,043.20	140.39	8.431		
16,000.00	9,455.00	17,368.49	10,528.90	104.49	110.15	153.99	-6,793.61	330.18	1,183.30	1,041.86	141.44	8.366		
16,050.00	9,455.00	17,420.08	10,528.53	105.18	110.86	153.99	-6,845.20	330.84	1,182.84	1,040.49	142.35	8.309		
16,100.00	9,455.00	17,469.10	10,528.04	105.87	111.53	153.99	-6,894.21	331.27	1,182.34	1,039.10	143.24	8.254		
16,150.00	9,455.00	17,516.76	10,527.64	106.56	112.19	153.98	-6,941.87	331.64	1,181.93	1,037.82	144.11	8.201		
16,200.00	9,455.00	17,566.36	10,527.28	107.25	112.87	153.98	-6,991.47	331.97	1,181.60	1,036.57	145.02	8.148		
16,250.00	9,455.00	17,616.87	10,526.87	107.93	113.57	153.97	-7,041.97	332.27	1,181.24	1,035.30	145.95	8.094		
16,300.00	9,455.00	17,663.32	10,526.51	108.62	114.21	153.96	-7,088.42	332.46	1,180.94	1,034.13	146.81	8.044		
16,350.00	9,455.00	17,708.87	10,526.26	109.32	114.84	153.94	-7,133.97	332.50	1,180.82	1,033.15	147.67	7.996		
16,356.38	9,455.00	17,714.88	10,526.24	109.40	114.92	153.94	-7,139.78	332.49	1,180.82	1,033.04	147.78	7.990		
16,400.00	9,455.00	17,755.39	10,526.12	110.01	115.48	153.92	-7,180.49	332.39	1,180.88	1,032.32	148.56	7.949		
16,450.00	9,455.00	17,802.22	10,526.06	110.70	116.12	153.89	-7,227.32	332.15	1,181.07	1,031.62	149.45	7.903		
16,500.00	9,455.00	17,852.81	10,526.05	111.39	116.82	153.87	-7,277.91	331.86	1,181.33	1,030.92	150.41	7.854		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 147-MWD+HDGM													Offset Well Error:	0.50 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
16,550.00	9,455.00	17,904.82	10,526.05	112.08	117.53	153.85	-7,329.92	331.74	1,181.52	1,030.14	151.38	7.805		
16,600.00	9,455.00	17,961.12	10,525.83	112.77	118.31	153.83	-7,388.22	331.79	1,181.55	1,029.12	152.42	7.752		
16,650.00	9,455.00	18,017.79	10,525.50	113.47	119.10	153.81	-7,442.89	331.96	1,181.29	1,027.82	153.47	7.697		
16,680.53	9,455.00	18,038.84	10,525.44	113.89	119.39	153.81	-7,463.94	331.98	1,181.24	1,027.36	153.88	7.676		
16,700.00	9,455.00	18,054.88	10,525.41	114.16	119.61	153.80	-7,479.95	331.99	1,181.27	1,027.08	154.19	7.661		
16,750.00	9,455.00	18,095.98	10,525.55	114.86	120.18	153.79	-7,521.07	331.91	1,181.60	1,026.64	154.97	7.625		
16,800.00	9,455.00	18,152.23	10,525.86	115.55	120.96	153.78	-7,577.32	331.88	1,182.00	1,026.00	156.00	7.577		
16,850.00	9,455.00	18,206.79	10,525.99	116.25	121.71	153.78	-7,631.89	332.18	1,182.13	1,025.14	156.99	7.530		
16,900.00	9,455.00	18,256.85	10,525.92	116.94	122.41	153.77	-7,681.94	332.21	1,182.19	1,024.27	157.92	7.486		
16,950.00	9,455.00	18,313.63	10,525.58	117.64	123.20	153.73	-7,738.72	331.90	1,182.19	1,023.18	159.01	7.435		
17,000.00	9,455.00	18,379.03	10,524.49	118.33	124.10	153.68	-7,804.11	331.74	1,181.64	1,021.39	160.25	7.374		
17,050.00	9,455.00	18,431.05	10,523.26	119.03	124.83	153.64	-7,856.12	331.74	1,180.72	1,019.45	161.27	7.321		
17,100.00	9,455.00	18,483.18	10,521.93	119.73	125.55	153.60	-7,908.23	331.74	1,179.72	1,017.42	162.30	7.269		
17,150.00	9,455.00	18,535.74	10,520.45	120.42	126.28	153.55	-7,960.77	331.70	1,178.61	1,015.27	163.34	7.216		
17,200.00	9,455.00	18,591.81	10,518.67	121.12	127.06	153.49	-8,016.81	331.64	1,177.37	1,012.92	164.45	7.160		
17,250.00	9,455.00	18,653.01	10,516.31	121.82	127.92	153.43	-8,077.96	331.85	1,175.71	1,010.09	165.63	7.099		
17,300.00	9,455.00	18,692.88	10,514.77	122.52	128.47	153.40	-8,117.80	332.15	1,173.97	1,007.49	166.47	7.052		
17,350.00	9,455.00	18,729.10	10,513.88	123.22	128.98	153.39	-8,154.01	332.50	1,172.80	1,005.57	167.23	7.013		
17,400.00	9,455.00	18,785.48	10,513.50	123.92	129.49	153.39	-8,190.38	332.92	1,172.21	1,004.27	167.94	6.980		
17,426.30	9,455.00	18,784.82	10,513.48	124.28	129.76	153.39	-8,209.72	333.14	1,172.13	1,003.83	168.30	6.964		
17,450.00	9,455.00	18,802.24	10,513.56	124.62	130.00	153.40	-8,227.14	333.32	1,172.20	1,003.57	168.62	6.952		
17,500.00	9,455.00	18,839.00	10,514.06	125.32	130.52	153.41	-8,263.90	333.63	1,172.75	1,003.47	169.28	6.928		
17,550.00	9,455.00	18,881.08	10,515.09	126.02	131.11	153.44	-8,305.96	334.01	1,173.78	1,003.79	169.99	6.905		
17,600.00	9,455.00	18,925.41	10,516.58	126.72	131.73	153.49	-8,350.27	334.71	1,175.07	1,004.37	170.70	6.884		
17,650.00	9,455.00	18,973.87	10,518.56	127.42	132.42	153.56	-8,398.67	335.79	1,176.55	1,005.11	171.44	6.863		
17,700.00	9,455.00	19,025.33	10,520.67	128.12	133.14	153.65	-8,450.07	337.01	1,178.00	1,005.78	172.22	6.840		
17,750.00	9,455.00	19,104.85	10,523.00	128.82	134.27	153.77	-8,529.53	339.07	1,178.93	1,005.49	173.45	6.797		
17,800.00	9,455.00	19,164.94	10,523.39	129.52	135.12	153.83	-8,589.59	340.83	1,178.69	1,004.29	174.39	6.759		
17,850.00	9,455.00	19,211.72	10,523.69	130.22	135.78	153.89	-8,636.35	342.17	1,178.49	1,003.34	175.16	6.728		
17,900.00	9,455.00	19,264.35	10,524.07	130.93	136.52	153.94	-8,688.96	343.61	1,178.35	1,002.35	176.00	6.695		
17,950.00	9,455.00	19,319.81	10,524.15	131.63	137.31	153.99	-8,744.40	345.03	1,178.00	1,001.09	176.91	6.659		
17,989.05	9,455.00	19,347.82	10,524.28	132.18	137.71	154.02	-8,772.40	345.79	1,177.81	1,000.42	177.39	6.640		
18,000.00	9,455.00	19,355.55	10,524.39	132.33	137.82	154.03	-8,780.12	346.03	1,177.82	1,000.31	177.51	6.635		
18,050.00	9,455.00	19,390.82	10,525.25	133.03	138.32	154.09	-8,815.36	347.30	1,178.27	1,000.24	178.04	6.618		
18,100.00	9,455.00	19,432.77	10,526.98	133.74	138.91	154.20	-8,857.24	349.13	1,179.31	1,000.72	178.58	6.604		
18,150.00	9,455.00	19,489.52	10,529.17	134.44	139.72	154.33	-8,913.89	351.51	1,180.27	1,000.92	179.35	6.581		
18,200.00	9,455.00	19,543.29	10,530.82	135.14	140.49	154.44	-8,967.60	353.50	1,180.99	1,000.88	180.11	6.557		
18,250.00	9,455.00	19,595.52	10,532.11	135.85	141.23	154.52	-9,019.80	355.03	1,181.61	1,000.71	180.90	6.532		
18,300.00	9,455.00	19,655.73	10,533.14	136.55	142.09	154.59	-9,079.98	356.53	1,181.99	1,000.14	181.85	6.500		
18,350.00	9,455.00	19,715.55	10,533.57	137.26	142.94	154.65	-9,139.77	358.07	1,181.90	999.10	182.80	6.466		
18,400.00	9,455.00	19,771.83	10,533.48	137.96	143.73	154.69	-9,196.04	359.30	1,181.49	997.76	183.73	6.431		
18,450.00	9,455.00	19,827.72	10,532.92	138.67	144.52	154.70	-9,251.92	360.21	1,180.82	996.12	184.71	6.393		
18,500.00	9,455.00	19,883.41	10,531.90	139.37	145.31	154.69	-9,307.60	360.78	1,179.91	994.18	185.73	6.353		
18,550.00	9,455.00	19,937.79	10,530.93	140.08	146.08	154.66	-9,361.96	361.11	1,178.79	992.02	186.77	6.312		
18,600.00	9,455.00	19,992.12	10,528.50	140.79	146.84	154.62	-9,416.27	361.33	1,177.48	989.65	187.83	6.269		
18,650.00	9,455.00	20,044.30	10,527.15	141.49	147.58	154.57	-9,468.42	361.48	1,176.04	987.17	188.87	6.227		
18,700.00	9,455.00	20,094.60	10,525.34	142.20	148.29	154.53	-9,518.68	361.58	1,174.51	984.62	189.89	6.185		
18,750.00	9,455.00	20,142.17	10,523.76	142.91	148.96	154.49	-9,566.22	361.79	1,173.06	982.19	190.86	6.146		
18,800.00	9,455.00	20,190.89	10,522.29	143.61	149.65	154.46	-9,614.92	362.11	1,171.69	979.86	191.83	6.108		
18,850.00	9,455.00	20,240.87	10,520.81	144.32	150.35	154.43	-9,664.88	362.46	1,170.34	977.52	192.82	6.070		
18,900.00	9,455.00	20,284.30	10,519.58	145.03	150.97	154.40	-9,708.29	362.73	1,169.07	975.37	193.71	6.035		
18,950.00	9,455.00	20,323.33	10,518.76	145.73	151.52	154.38	-9,747.31	362.78	1,168.24	973.71	194.52	6.006		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 215H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 147-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		
19,000.00	9,455.00	20,364.34	10,518.23	146.44	152.10	154.35	-9,788.32	362.63	1,167.86	972.49	195.37	5.978		
19,050.00	9,455.00	20,413.87	10,517.71	147.15	152.79	154.31	-9,837.84	362.34	1,167.66	971.29	196.37	5.946		
19,100.00	9,455.00	20,461.37	10,517.22	147.88	153.48	154.27	-9,885.34	362.02	1,167.48	970.15	197.33	5.916		
19,113.88	9,455.00	20,473.18	10,517.13	148.05	153.63	154.26	-9,897.15	361.93	1,167.47	969.89	197.58	5.909		
19,150.00	9,455.00	20,503.92	10,516.99	148.57	154.08	154.24	-9,927.88	361.87	1,167.55	969.35	198.20	5.891		
19,200.00	9,455.00	20,546.73	10,517.03	149.27	154.66	154.21	-9,970.70	361.25	1,167.94	968.88	199.06	5.867		
19,250.00	9,455.00	20,592.62	10,517.35	149.98	155.31	154.19	-10,016.58	360.88	1,168.57	968.61	199.96	5.844		
19,300.00	9,455.00	20,638.64	10,517.94	150.69	155.96	154.18	-10,062.60	360.71	1,169.37	968.55	200.83	5.823		
19,350.00	9,455.00	20,688.63	10,518.73	151.40	156.66	154.18	-10,112.59	360.62	1,170.26	968.50	201.75	5.800		
19,400.00	9,455.00	20,739.04	10,519.52	152.11	157.38	154.17	-10,162.99	360.53	1,171.14	968.45	202.69	5.778		
19,450.00	9,455.00	20,792.15	10,520.25	152.82	158.13	154.17	-10,216.09	360.44	1,171.94	968.26	203.68	5.754		
19,500.00	9,455.00	20,844.90	10,520.82	153.53	158.87	154.16	-10,268.84	360.34	1,172.61	967.94	204.67	5.729		
19,550.00	9,455.00	20,897.00	10,521.20	154.24	159.61	154.15	-10,320.94	360.07	1,173.18	967.50	205.68	5.704		
19,600.00	9,455.00	20,950.03	10,521.35	154.95	160.36	154.11	-10,373.96	359.59	1,173.65	966.91	206.74	5.677		
19,650.00	9,455.00	21,003.78	10,521.20	155.66	161.11	154.08	-10,427.71	358.83	1,173.97	966.11	207.86	5.648		
19,700.00	9,455.00	21,056.15	10,520.82	156.37	161.85	154.00	-10,480.07	357.96	1,174.15	965.18	208.97	5.619		
19,750.00	9,455.00	21,108.19	10,520.39	157.08	162.58	153.94	-10,532.11	357.18	1,174.25	964.17	210.08	5.590		
19,800.00	9,455.00	21,155.71	10,519.97	157.79	163.25	153.89	-10,579.61	356.41	1,174.35	963.25	211.10	5.563		
19,850.00	9,455.00	21,203.82	10,519.55	158.50	163.93	153.82	-10,627.71	355.41	1,174.56	962.40	212.18	5.538		
19,900.00	9,455.00	21,257.47	10,518.99	159.21	164.68	153.74	-10,681.34	354.22	1,174.72	961.38	213.35	5.506		
19,950.00	9,455.00	21,312.58	10,518.24	159.92	165.45	153.66	-10,736.44	353.06	1,174.72	960.15	214.57	5.475		
20,000.00	9,455.00	21,370.82	10,517.08	160.64	166.27	153.57	-10,794.66	351.89	1,174.41	958.55	215.87	5.440		
20,050.00	9,455.00	21,421.81	10,515.84	161.35	166.99	153.48	-10,845.62	350.92	1,173.89	956.87	217.02	5.409		
20,055.16	9,455.00	21,426.97	10,515.71	161.42	167.06	153.47	-10,850.78	350.82	1,173.84	956.70	217.14	5.406 SF		

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 216H - Wellbore #1 - Wellbore #1												Offset Site Error:	0.00 ft
Survey Program: 139-MWD+HDGM												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 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	4.87	4.87	0.50	0.50	-68.88	291.55	-754.67	809.03				
50.00	50.00	56.64	56.64	0.50	0.51	-68.87	291.59	-754.58	808.97	807.96	1.01	802.541	
100.00	100.00	108.42	108.42	0.52	0.52	-68.86	291.70	-754.35	808.79	807.75	1.04	778.081	
150.00	150.00	159.73	159.73	0.59	0.57	-68.84	291.87	-753.97	808.51	807.35	1.16	699.276	
200.00	200.00	210.37	210.36	0.70	0.67	-68.81	292.13	-753.52	808.18	806.81	1.37	588.853	
250.00	250.00	260.28	260.27	0.84	0.80	-68.77	292.45	-753.01	807.82	806.19	1.64	493.085	
300.00	300.00	309.76	309.75	0.99	0.95	-68.74	292.77	-752.54	807.50	805.56	1.93	417.772	
350.00	350.00	359.30	359.28	1.15	1.10	-68.71	293.07	-752.10	807.20	804.95	2.25	359.447	
400.00	400.00	408.88	408.86	1.31	1.26	-68.68	293.35	-751.71	806.93	804.36	2.57	313.969	
450.00	450.00	459.20	459.18	1.48	1.43	-68.66	293.58	-751.33	806.67	803.76	2.90	277.720	
500.00	500.00	509.91	509.89	1.65	1.60	-68.63	293.77	-750.94	806.37	803.12	3.25	248.433	
550.00	550.00	559.71	559.69	1.82	1.77	-68.61	293.93	-750.53	806.05	802.46	3.59	224.669	
600.00	600.00	609.30	609.28	1.99	1.94	-68.59	294.14	-750.13	805.75	801.82	3.93	204.936	
650.00	650.00	659.72	659.69	2.16	2.12	-68.56	294.35	-749.73	805.45	801.17	4.28	188.159	
700.00	700.00	710.18	710.15	2.34	2.29	-68.54	294.52	-749.31	805.13	800.50	4.63	173.837	
750.00	750.00	759.82	759.79	2.51	2.47	-68.53	294.63	-748.92	804.81	799.83	4.98	161.593	
800.00	800.00	809.21	809.18	2.69	2.64	-68.51	294.68	-748.58	804.50	799.18	5.33	150.951	
850.00	850.00	858.29	858.25	2.87	2.81	-68.50	294.79	-748.27	804.26	798.58	5.68	141.631	
900.00	900.00	907.35	907.31	3.04	2.99	-68.48	294.96	-748.00	804.06	798.04	6.03	133.387	
950.00	950.00	956.40	956.36	3.22	3.16	-68.46	295.13	-747.80	803.93	797.55	6.38	126.044	
992.88	992.88	997.61	997.58	3.37	3.30	-68.45	295.28	-747.69	803.88	797.21	6.67	120.449 CC	
1,000.00	1,000.00	1,004.41	1,004.38	3.40	3.33	-68.45	295.31	-747.68	803.88	797.16	6.72	119.572	
1,050.00	1,050.00	1,052.36	1,052.32	3.58	3.49	-68.43	295.54	-747.68	803.97	796.90	7.07	113.768	
1,100.00	1,100.00	1,101.33	1,101.29	3.75	3.66	-68.42	295.82	-747.76	804.15	798.74	7.41	108.496	
1,150.00	1,150.00	1,150.30	1,150.26	3.93	3.83	-68.40	296.11	-747.90	804.40	796.64	7.76	103.697	
1,200.00	1,200.00	1,199.51	1,199.47	4.11	4.00	-68.38	296.47	-748.08	804.70	796.59	8.10	99.299	
1,250.00	1,250.00	1,248.98	1,248.94	4.29	4.17	-68.36	296.90	-748.27	805.04	796.59	8.45	95.251	
1,300.00	1,300.00	1,299.90	1,299.85	4.46	4.34	-68.33	297.38	-748.45	805.37	796.57	8.81	91.450	
1,350.00	1,350.00	1,350.29	1,350.25	4.64	4.52	-68.30	297.84	-748.56	805.65	796.49	9.16	87.953	
1,400.00	1,400.00	1,399.73	1,399.68	4.82	4.69	-68.28	298.24	-748.72	805.95	796.44	9.51	84.746	
1,450.00	1,450.00	1,449.53	1,449.48	5.00	4.87	-68.26	298.61	-748.92	806.27	796.41	9.86	81.755	
1,500.00	1,500.00	1,499.70	1,499.65	5.18	5.04	-68.24	299.05	-749.08	806.59	796.37	10.22	78.958	
1,550.00	1,550.00	1,550.15	1,550.10	5.36	5.22	-68.21	299.56	-749.21	806.89	796.32	10.57	76.330	
1,600.00	1,600.00	1,600.77	1,600.71	5.53	5.40	-68.18	300.07	-749.30	807.16	796.23	10.93	73.862	
1,650.00	1,650.00	1,650.35	1,650.29	5.71	5.57	-68.15	300.52	-749.38	807.41	796.13	11.28	71.575	
1,700.00	1,700.00	1,699.60	1,699.54	5.89	5.74	-68.13	300.89	-749.55	807.70	796.07	11.63	69.438	
1,750.00	1,750.00	1,749.37	1,749.31	6.07	5.92	-68.11	301.19	-749.78	808.03	796.05	11.98	67.425	
1,800.00	1,800.00	1,799.23	1,799.17	6.25	6.09	-68.10	301.48	-750.03	808.37	796.03	12.34	65.526	
1,850.00	1,850.00	1,850.41	1,850.34	6.43	6.27	-68.09	301.77	-750.25	808.68	795.98	12.69	63.701	
1,900.00	1,900.00	1,901.61	1,901.54	6.61	6.45	-68.08	302.03	-750.40	808.91	795.86	13.05	61.970	
1,950.00	1,950.00	1,950.80	1,950.73	6.78	6.62	-68.06	302.32	-750.53	809.14	795.74	13.41	60.358	
2,000.00	2,000.00	2,000.69	2,000.62	6.96	6.80	-68.04	302.65	-750.68	809.40	795.64	13.76	58.821	
2,050.00	2,050.00	2,051.83	2,051.76	7.14	6.98	-68.03	302.91	-750.81	809.62	795.50	14.12	57.342	
2,100.00	2,100.00	2,101.67	2,101.60	7.32	7.15	-68.02	303.04	-750.93	809.78	795.31	14.47	55.953	
2,150.00	2,150.00	2,149.46	2,149.39	7.50	7.32	-68.02	303.17	-751.15	810.04	795.22	14.82	54.667	
2,200.00	2,200.00	2,198.53	2,198.45	7.68	7.49	-68.02	303.34	-751.48	810.42	795.25	15.17	53.431	
2,250.00	2,250.00	2,249.48	2,249.41	7.86	7.67	-68.01	303.55	-751.79	810.77	795.25	15.52	52.225	
2,300.00	2,300.00	2,299.12	2,299.05	8.04	7.84	-68.00	303.79	-752.03	811.09	795.22	15.88	51.085 ES	
2,350.00	2,350.00	2,347.63	2,347.55	8.22	8.01	-68.00	304.01	-752.36	811.49	795.26	16.23	50.012	
2,400.00	2,400.00	2,398.62	2,398.54	8.39	8.19	-68.00	304.21	-752.76	811.93	795.35	16.58	48.961	
2,450.00	2,450.00	2,451.42	2,451.34	8.57	8.38	-67.99	304.35	-753.04	812.22	795.28	16.95	47.928	
2,500.00	2,500.00	2,494.92	2,494.84	8.75	8.53	-67.99	304.50	-753.30	812.57	795.30	17.28	47.031	

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 Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 216H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 139-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		
2,550.00	2,550.00	2,536.09	2,536.00	8.93	8.67	-67.98	304.85	-753.93	813.45	795.85	17.60	46.225		
2,600.00	2,600.00	2,578.77	2,578.67	9.11	8.82	-67.97	305.44	-754.98	814.85	796.92	17.92	45.464		
2,650.00	2,650.00	2,622.88	2,622.75	9.29	8.98	-67.96	306.26	-756.34	816.62	798.37	18.25	44.740		
2,700.00	2,700.00	2,669.84	2,669.66	9.47	9.14	-67.93	307.34	-758.04	818.73	800.13	18.59	44.031		
2,750.00	2,750.00	2,721.40	2,721.18	9.64	9.33	-161.45	308.51	-759.89	821.02	802.07	18.95	43.323		
2,800.00	2,799.99	2,771.96	2,771.69	9.82	9.51	-161.43	309.62	-761.63	823.65	804.35	19.30	42.687		
2,850.00	2,849.98	2,821.66	2,821.35	9.99	9.68	-161.40	310.92	-763.26	826.69	807.04	19.65	42.073		
2,900.00	2,899.96	2,867.63	2,867.27	10.16	9.84	-161.37	312.33	-764.76	830.23	810.25	19.98	41.556		
2,950.00	2,949.92	2,911.35	2,910.93	10.33	10.00	-161.34	313.90	-766.42	834.52	814.22	20.30	41.113		
3,000.00	2,999.86	2,958.70	2,958.20	10.50	10.17	-161.30	315.81	-768.46	839.54	818.90	20.63	40.688		
3,050.00	3,049.78	3,010.40	3,009.82	10.67	10.35	-161.28	317.81	-770.66	844.92	823.93	20.99	40.254		
3,100.00	3,099.68	3,062.79	3,062.13	10.84	10.54	-161.28	319.67	-772.81	850.58	829.23	21.35	39.842		
3,150.00	3,149.54	3,115.61	3,114.88	11.02	10.73	-161.29	321.32	-774.86	856.47	834.76	21.71	39.451		
3,200.00	3,199.37	3,161.29	3,160.51	11.19	10.89	-161.32	322.58	-776.69	862.76	840.72	22.04	39.148		
3,250.00	3,249.16	3,205.31	3,204.46	11.36	11.05	-161.37	323.64	-778.81	869.76	847.40	22.36	38.900		
3,300.00	3,298.90	3,249.89	3,248.97	11.54	11.21	-161.45	324.55	-781.31	877.47	854.79	22.68	38.688		
3,350.00	3,348.61	3,294.60	3,293.58	11.72	11.36	-161.55	325.26	-784.15	885.85	862.85	23.00	38.511		
3,400.00	3,398.26	3,337.80	3,336.66	11.89	11.52	-161.67	325.75	-787.22	894.92	871.61	23.32	38.383		
3,450.00	3,447.86	3,379.82	3,378.55	12.07	11.67	-161.81	326.01	-790.64	904.77	881.15	23.62	38.303		
3,500.00	3,497.40	3,423.76	3,422.30	12.25	11.82	-161.99	326.07	-794.84	915.40	891.46	23.94	38.243		
3,550.00	3,546.89	3,472.03	3,470.37	12.43	11.99	-162.19	326.13	-799.14	926.54	902.26	24.27	38.169		
3,600.00	3,596.30	3,522.14	3,520.26	12.61	12.17	-162.39	326.27	-803.77	938.10	913.47	24.62	38.097		
3,650.00	3,645.68	3,575.51	3,573.43	12.79	12.36	-162.63	326.63	-808.40	949.70	924.71	24.99	38.003		
3,700.00	3,695.06	3,627.07	3,624.82	12.97	12.55	-162.84	327.11	-812.57	961.10	935.75	25.35	37.917		
3,750.00	3,744.44	3,677.32	3,674.90	13.16	12.73	-163.06	327.22	-816.66	972.41	946.72	25.70	37.840		
3,800.00	3,793.82	3,728.67	3,724.09	13.34	12.90	-163.29	327.01	-820.72	983.67	957.63	26.04	37.770		
3,850.00	3,843.20	3,775.66	3,772.91	13.53	13.08	-163.51	326.78	-824.73	994.92	968.53	26.39	37.704		
3,900.00	3,892.58	3,834.67	3,831.74	13.71	13.29	-163.78	326.41	-829.32	1,005.98	979.20	26.78	37.560		
3,950.00	3,941.96	3,897.02	3,893.95	13.90	13.51	-164.05	325.71	-833.43	1,016.41	989.22	27.19	37.377		
4,000.00	3,991.34	3,942.33	3,939.16	14.09	13.67	-164.26	325.03	-836.34	1,026.72	999.20	27.52	37.308		
4,050.00	4,040.72	3,988.49	3,985.21	14.27	13.83	-164.47	324.18	-839.35	1,037.04	1,009.19	27.85	37.234		
4,100.00	4,090.10	4,029.04	4,025.64	14.46	13.98	-164.66	323.38	-842.27	1,047.67	1,019.52	28.15	37.211		
4,150.00	4,139.48	4,069.42	4,065.89	14.65	14.12	-164.85	322.56	-845.52	1,058.70	1,030.24	28.46	37.205		
4,200.00	4,188.86	4,118.34	4,114.63	14.84	14.30	-165.09	321.54	-849.67	1,069.94	1,041.13	28.80	37.148		
4,250.00	4,238.24	4,168.33	4,164.43	15.03	14.48	-165.32	320.45	-853.88	1,081.14	1,051.99	29.15	37.084		
4,300.00	4,287.61	4,229.97	4,225.85	15.22	14.70	-165.62	318.77	-858.73	1,092.04	1,062.47	29.57	36.937		
4,350.00	4,336.99	4,284.85	4,280.55	15.41	14.89	-165.89	316.86	-862.59	1,102.44	1,072.50	29.94	36.820		
4,400.00	4,386.37	4,332.76	4,328.33	15.61	15.06	-166.12	315.41	-865.84	1,112.82	1,082.54	30.28	36.748		
4,450.00	4,435.75	4,375.48	4,370.94	15.80	15.21	-166.29	314.41	-868.74	1,123.31	1,092.71	30.60	36.711		
4,500.00	4,485.13	4,413.58	4,408.94	15.99	15.35	-166.44	313.81	-871.57	1,134.22	1,103.33	30.89	36.717		
4,550.00	4,534.51	4,452.16	4,447.39	16.19	15.49	-166.58	313.49	-874.73	1,145.60	1,114.42	31.18	36.738		
4,600.00	4,583.89	4,504.94	4,499.98	16.38	15.68	-166.75	313.22	-879.12	1,157.10	1,125.55	31.55	36.671		
4,650.00	4,633.27	4,558.59	4,553.46	16.57	15.88	-166.92	312.94	-883.38	1,168.43	1,136.50	31.93	36.594		
4,700.00	4,682.65	4,614.85	4,609.57	16.77	16.08	-167.10	312.61	-887.52	1,179.48	1,147.16	32.32	36.495		
4,750.00	4,732.03	4,665.25	4,659.84	16.96	16.26	-167.25	312.27	-890.99	1,190.30	1,157.62	32.68	36.426		
4,800.00	4,781.41	4,710.78	4,705.26	17.16	16.43	-167.38	312.01	-894.19	1,201.21	1,168.20	33.01	36.390		
4,850.00	4,830.79	4,756.13	4,750.49	17.35	16.59	-167.51	311.79	-897.48	1,212.26	1,178.92	33.34	36.359		
4,900.00	4,880.17	4,801.27	4,795.50	17.55	16.76	-167.63	311.64	-900.88	1,223.45	1,189.78	33.67	36.334		
4,950.00	4,929.55	4,847.30	4,841.40	17.75	16.92	-167.76	311.54	-904.46	1,234.78	1,200.78	34.01	36.309		
5,000.00	4,978.93	4,894.83	4,888.78	17.94	17.10	-167.88	311.61	-908.17	1,246.18	1,211.83	34.35	36.277		
5,050.00	5,028.30	4,943.58	4,937.38	18.14	17.28	-167.99	311.84	-911.97	1,257.62	1,222.92	34.70	36.240		
5,100.00	5,077.68	4,994.31	4,987.96	18.34	17.46	-168.11	312.02	-915.87	1,269.00	1,233.94	35.07	36.180		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 216H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 139-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		
5,150.00	5,127.06	5,040.48	5,034.00	18.54	17.63	-168.21	312.09	-919.41	1,280.36	1,244.95	35.40	36.166		
5,200.00	5,176.44	5,082.25	5,075.63	18.73	17.78	-168.31	312.29	-922.78	1,291.93	1,256.22	35.71	36.174		
5,250.00	5,225.82	5,125.70	5,118.92	18.93	17.94	-168.40	312.66	-926.46	1,303.78	1,267.72	36.04	36.180		
5,300.00	5,275.20	5,174.79	5,167.83	19.13	18.12	-168.50	313.10	-930.68	1,315.65	1,279.26	36.39	36.154		
5,350.00	5,324.58	5,225.90	5,218.75	19.33	18.31	-168.60	313.49	-935.06	1,327.51	1,290.76	36.76	36.117		
5,400.00	5,373.96	5,281.29	5,273.95	19.53	18.52	-168.72	313.73	-939.61	1,339.18	1,302.03	37.15	36.051		
5,450.00	5,423.34	5,335.23	5,327.73	19.73	18.71	-168.83	313.80	-943.83	1,350.62	1,313.09	37.53	35.989		
5,500.00	5,472.72	5,388.25	5,380.60	19.93	18.91	-168.94	313.88	-947.79	1,361.90	1,324.00	37.91	35.929		
5,550.00	5,522.10	5,431.85	5,424.08	20.13	19.07	-169.03	313.93	-951.03	1,373.17	1,334.94	38.23	35.919		
5,600.00	5,571.48	5,473.22	5,465.31	20.33	19.22	-169.12	313.95	-954.32	1,384.69	1,346.15	38.54	35.928		
5,650.00	5,620.86	5,515.98	5,507.92	20.53	19.38	-169.21	313.93	-957.96	1,396.45	1,357.59	38.86	35.937		
5,700.00	5,670.24	5,560.05	5,551.81	20.73	19.54	-169.30	313.87	-961.88	1,408.39	1,369.20	39.18	35.943		
5,750.00	5,719.61	5,609.98	5,601.54	20.93	19.72	-169.42	313.77	-966.44	1,420.44	1,380.89	39.54	35.920		
5,800.00	5,768.99	5,670.40	5,661.73	21.13	19.95	-169.54	313.61	-971.60	1,432.21	1,392.24	39.97	35.835		
5,850.00	5,818.37	5,722.62	5,713.79	21.33	20.14	-169.65	313.52	-975.73	1,443.69	1,403.34	40.34	35.787		
5,900.00	5,867.75	5,772.90	5,763.92	21.53	20.32	-169.74	313.54	-979.61	1,455.11	1,414.40	40.70	35.749		
5,950.00	5,917.13	5,816.47	5,807.35	21.73	20.48	-169.82	313.62	-983.00	1,466.58	1,425.55	41.03	35.746 SF		
6,000.00	5,966.51	5,859.35	5,850.10	21.94	20.64	-169.90	313.71	-986.50	1,478.24	1,436.89	41.35	35.752		
6,050.00	6,015.89	5,902.95	5,893.54	22.14	20.80	-169.98	313.77	-990.24	1,490.09	1,448.41	41.67	35.758		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 524H - 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)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.50	0.50	-90.55	-0.58	-59.96	59.96					
50.00	50.00	50.00	50.00	0.50	0.50	-90.55	-0.58	-59.96	59.96	58.96	1.01	59.576		
100.00	100.00	100.00	100.00	0.52	0.52	-90.55	-0.58	-59.96	59.96	58.93	1.04	57.807		
150.00	150.00	150.00	150.00	0.59	0.59	-90.55	-0.58	-59.96	59.96	58.78	1.18	50.795		
200.00	200.00	200.00	200.00	0.70	0.70	-90.55	-0.58	-59.96	59.96	58.56	1.40	42.702		
250.00	250.00	250.00	250.00	0.84	0.84	-90.55	-0.58	-59.96	59.96	58.29	1.68	35.790		
300.00	300.00	300.00	300.00	0.99	0.99	-90.55	-0.58	-59.96	59.96	57.99	1.97	30.366		
350.00	350.00	350.00	350.00	1.15	1.15	-90.55	-0.58	-59.96	59.96	57.67	2.29	26.173		
400.00	400.00	400.00	400.00	1.31	1.31	-90.55	-0.58	-59.96	59.96	57.34	2.62	22.903		
450.00	450.00	450.00	450.00	1.48	1.48	-90.55	-0.58	-59.96	59.96	57.01	2.95	20.308		
500.00	500.00	500.00	500.00	1.65	1.65	-90.55	-0.58	-59.96	59.96	56.67	3.29	18.214		
550.00	550.00	550.00	550.00	1.82	1.82	-90.55	-0.58	-59.96	59.96	56.33	3.64	16.494		
600.00	600.00	600.00	600.00	1.99	1.99	-90.55	-0.58	-59.96	59.96	55.98	3.98	15.062		
650.00	650.00	650.00	650.00	2.16	2.16	-90.55	-0.58	-59.96	59.96	55.63	4.33	13.851		
700.00	700.00	700.00	700.00	2.34	2.34	-90.55	-0.58	-59.96	59.96	55.28	4.68	12.816		
750.00	750.00	750.00	750.00	2.51	2.51	-90.55	-0.58	-59.96	59.96	54.93	5.03	11.922		
800.00	800.00	800.00	800.00	2.69	2.69	-90.55	-0.58	-59.96	59.96	54.58	5.38	11.143		
850.00	850.00	850.00	850.00	2.87	2.87	-90.55	-0.58	-59.96	59.96	54.23	5.73	10.458		
900.00	900.00	900.00	900.00	3.04	3.04	-90.55	-0.58	-59.96	59.96	53.88	6.09	9.851		
950.00	950.00	950.00	950.00	3.22	3.22	-90.55	-0.58	-59.96	59.96	53.52	6.44	9.310		
1,000.00	1,000.00	1,000.00	1,000.00	3.40	3.40	-90.55	-0.58	-59.96	59.96	53.17	6.80	8.824		
1,050.00	1,050.00	1,050.00	1,050.00	3.58	3.58	-90.55	-0.58	-59.96	59.96	52.81	7.15	8.386		
1,100.00	1,100.00	1,100.00	1,100.00	3.75	3.75	-90.55	-0.58	-59.96	59.96	52.46	7.51	7.990		
1,150.00	1,150.00	1,150.00	1,150.00	3.93	3.93	-90.55	-0.58	-59.96	59.96	52.10	7.86	7.628		
1,200.00	1,200.00	1,200.00	1,200.00	4.11	4.11	-90.55	-0.58	-59.96	59.96	51.75	8.22	7.288		
1,250.00	1,250.00	1,250.00	1,250.00	4.29	4.29	-90.55	-0.58	-59.96	59.96	51.39	8.57	6.995		
1,300.00	1,300.00	1,300.00	1,300.00	4.46	4.46	-90.55	-0.58	-59.96	59.96	51.03	8.93	6.716		
1,350.00	1,350.00	1,350.00	1,350.00	4.64	4.64	-90.55	-0.58	-59.96	59.96	50.68	9.28	6.458		
1,400.00	1,400.00	1,400.00	1,400.00	4.82	4.82	-90.55	-0.58	-59.96	59.96	50.32	9.64	6.220		
1,450.00	1,450.00	1,450.00	1,450.00	5.00	5.00	-90.55	-0.58	-59.96	59.96	49.97	10.00	5.998		
1,500.00	1,500.00	1,500.00	1,500.00	5.18	5.18	-90.55	-0.58	-59.96	59.96	49.61	10.35	5.791		
1,550.00	1,550.00	1,550.00	1,550.00	5.36	5.36	-90.55	-0.58	-59.96	59.96	49.25	10.71	5.598		
1,600.00	1,600.00	1,600.00	1,600.00	5.53	5.53	-90.55	-0.58	-59.96	59.96	48.89	11.07	5.418		
1,650.00	1,650.00	1,650.00	1,650.00	5.71	5.71	-90.55	-0.58	-59.96	59.96	48.54	11.43	5.248		
1,700.00	1,700.00	1,700.00	1,700.00	5.89	5.89	-90.55	-0.58	-59.96	59.96	48.18	11.78	5.089		
1,750.00	1,750.00	1,750.00	1,750.00	6.07	6.07	-90.55	-0.58	-59.96	59.96	47.82	12.14	4.939 Alert		
1,800.00	1,800.00	1,800.00	1,800.00	6.25	6.25	-90.55	-0.58	-59.96	59.96	47.47	12.50	4.798 Alert		
1,850.00	1,850.00	1,850.00	1,850.00	6.43	6.43	-90.55	-0.58	-59.96	59.96	47.11	12.85	4.665 Alert		
1,900.00	1,900.00	1,900.00	1,900.00	6.61	6.61	-90.55	-0.58	-59.96	59.96	46.75	13.21	4.539 Alert		
1,950.00	1,950.00	1,950.00	1,950.00	6.78	6.78	-90.55	-0.58	-59.96	59.96	46.39	13.57	4.419 Alert		
2,000.00	2,000.00	2,000.00	2,000.00	6.96	6.96	-90.55	-0.58	-59.96	59.96	46.04	13.93	4.306 Alert		
2,050.00	2,050.00	2,050.00	2,050.00	7.14	7.14	-90.55	-0.58	-59.96	59.96	45.68	14.28	4.198 Alert		
2,100.00	2,100.00	2,100.00	2,100.00	7.32	7.32	-90.55	-0.58	-59.96	59.96	45.32	14.64	4.095 Alert		
2,150.00	2,150.00	2,150.00	2,150.00	7.50	7.50	-90.55	-0.58	-59.96	59.96	44.96	15.00	3.998 Alert		
2,200.00	2,200.00	2,200.00	2,200.00	7.68	7.68	-90.55	-0.58	-59.96	59.96	44.61	15.36	3.905 Alert		
2,250.00	2,250.00	2,250.00	2,250.00	7.86	7.86	-90.55	-0.58	-59.96	59.96	44.25	15.71	3.816 Alert		
2,300.00	2,300.00	2,300.00	2,300.00	8.04	8.04	-90.55	-0.58	-59.96	59.96	43.89	16.07	3.731 Alert		
2,350.00	2,350.00	2,350.00	2,350.00	8.22	8.22	-90.55	-0.58	-59.96	59.96	43.53	16.43	3.649 Alert		
2,400.00	2,400.00	2,400.00	2,400.00	8.39	8.39	-90.55	-0.58	-59.96	59.96	43.17	16.79	3.572 Alert		
2,450.00	2,450.00	2,450.00	2,450.00	8.57	8.57	-90.55	-0.58	-59.96	59.96	42.82	17.15	3.497 Alert		
2,500.00	2,500.00	2,500.00	2,500.00	8.75	8.75	-90.55	-0.58	-59.96	59.96	42.46	17.50	3.426 Alert		
2,550.00	2,550.00	2,550.00	2,550.00	8.93	8.93	-90.55	-0.58	-59.96	59.96	42.10	17.86	3.357 Alert		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 524H - 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	Separation Factor	Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
2,600.00	2,600.00	2,600.00	2,600.00	9.11	9.11	-90.55	-0.58	-59.96	59.96	41.74	18.22	3.291	Alert	
2,650.00	2,650.00	2,650.00	2,650.00	9.29	9.29	-90.55	-0.58	-59.96	59.96	41.39	18.58	3.228	Alert	
2,700.00	2,700.00	2,700.00	2,700.00	9.47	9.47	-90.55	-0.58	-59.96	59.96	41.03	18.94	3.187	Alert, CC, ES	
2,750.00	2,750.00	2,749.22	2,749.22	9.64	9.64	175.89	-0.60	-60.28	60.50	41.22	19.28	3.138	Alert, SF	
2,800.00	2,799.99	2,798.41	2,798.40	9.82	9.81	175.89	-0.66	-61.23	62.12	42.50	19.62	3.166	Alert	
2,850.00	2,849.98	2,847.52	2,847.48	9.99	9.98	175.89	-0.75	-62.80	64.81	44.86	19.95	3.249	Alert	
2,900.00	2,899.96	2,896.52	2,896.44	10.16	10.15	175.88	-0.88	-65.01	68.58	48.31	20.28	3.382	Alert	
2,950.00	2,949.92	2,945.38	2,945.21	10.33	10.31	175.87	-1.06	-67.82	73.42	52.82	20.60	3.564	Alert	
3,000.00	2,999.86	2,994.06	2,993.77	10.50	10.48	175.87	-1.26	-71.25	79.33	58.41	20.92	3.792	Alert	
3,050.00	3,049.78	3,042.52	3,042.06	10.67	10.65	175.86	-1.51	-75.28	86.30	65.06	21.24	4.063	Alert	
3,100.00	3,099.68	3,090.74	3,090.06	10.84	10.81	175.85	-1.78	-79.89	94.32	72.77	21.55	4.377	Alert	
3,150.00	3,149.54	3,138.67	3,137.71	11.02	10.98	175.84	-2.10	-85.08	103.39	81.53	21.86	4.730	Alert	
3,200.00	3,199.37	3,186.29	3,184.97	11.19	11.15	175.83	-2.44	-90.82	113.50	91.33	22.16	5.121		
3,250.00	3,249.16	3,233.81	3,232.07	11.36	11.32	175.82	-2.82	-97.12	124.63	102.16	22.47	5.547		
3,300.00	3,298.90	3,282.41	3,280.21	11.54	11.49	175.82	-3.23	-103.78	136.40	113.59	22.81	5.981		
3,350.00	3,348.61	3,330.90	3,328.24	11.72	11.66	175.83	-3.63	-110.42	148.59	125.45	23.14	6.421		
3,400.00	3,398.26	3,379.28	3,376.17	11.89	11.83	175.85	-4.03	-117.05	161.20	137.72	23.48	6.866		
3,450.00	3,447.86	3,427.55	3,423.98	12.07	12.01	175.88	-4.43	-123.66	174.23	150.42	23.81	7.317		
3,500.00	3,497.40	3,475.71	3,471.68	12.25	12.18	175.91	-4.83	-130.26	187.69	163.54	24.15	7.772		
3,550.00	3,546.89	3,523.74	3,519.27	12.43	12.35	175.94	-5.22	-136.84	201.56	177.07	24.48	8.233		
3,600.00	3,596.30	3,571.66	3,566.73	12.61	12.53	175.98	-5.62	-143.40	215.84	191.03	24.82	8.697		
3,650.00	3,645.68	3,619.50	3,614.12	12.79	12.70	176.02	-6.02	-149.95	230.37	205.22	25.15	9.159		
3,700.00	3,695.06	3,667.34	3,661.51	12.97	12.88	176.06	-6.41	-156.51	244.90	219.41	25.49	9.609		
3,750.00	3,744.44	3,715.19	3,708.90	13.16	13.05	176.10	-6.81	-163.06	259.43	233.60	25.82	10.046		
3,800.00	3,793.82	3,763.03	3,756.29	13.34	13.23	176.13	-7.20	-169.61	273.96	247.80	26.16	10.473		
3,850.00	3,843.20	3,810.87	3,803.68	13.53	13.40	176.16	-7.60	-176.17	288.48	261.99	26.50	10.888		
3,900.00	3,892.58	3,858.71	3,851.07	13.71	13.58	176.18	-7.99	-182.72	303.01	276.18	26.83	11.292		
3,950.00	3,941.96	3,906.56	3,898.46	13.90	13.76	176.21	-8.39	-189.27	317.54	290.37	27.17	11.687		
4,000.00	3,991.34	3,954.40	3,945.85	14.09	13.94	176.23	-8.79	-195.82	332.07	304.56	27.51	12.071		
4,050.00	4,040.72	4,002.24	3,993.24	14.27	14.12	176.25	-9.18	-202.38	346.60	318.75	27.85	12.446		
4,100.00	4,090.10	4,050.08	4,040.63	14.46	14.29	176.27	-9.58	-208.93	361.13	332.94	28.19	12.811		
4,150.00	4,139.48	4,102.07	4,088.02	14.65	14.49	176.28	-9.97	-215.48	375.65	347.11	28.54	13.161		
4,200.00	4,188.86	4,145.77	4,135.41	14.84	14.65	176.30	-10.37	-222.04	390.18	361.31	28.87	13.516		
4,250.00	4,238.24	4,206.39	4,182.80	15.03	14.88	176.31	-10.77	-228.59	404.71	375.46	29.26	13.834		
4,300.00	4,287.61	4,241.45	4,230.19	15.22	15.01	176.33	-11.16	-235.14	419.24	389.69	29.55	14.187		
4,350.00	4,336.99	4,289.30	4,277.58	15.41	15.20	176.34	-11.56	-241.70	433.77	403.88	29.89	14.511		
4,400.00	4,386.37	4,337.14	4,324.97	15.61	15.38	176.35	-11.95	-248.25	448.30	418.06	30.23	14.827		
4,450.00	4,435.75	4,384.98	4,372.36	15.80	15.56	176.36	-12.35	-254.80	462.83	432.25	30.58	15.136		
4,500.00	4,485.13	4,432.83	4,419.75	15.99	15.74	176.37	-12.74	-261.36	477.36	446.43	30.92	15.438		
4,550.00	4,534.51	4,480.67	4,467.14	16.19	15.92	176.38	-13.14	-267.91	491.88	460.62	31.26	15.733		
4,600.00	4,583.89	4,528.51	4,514.53	16.38	16.10	176.39	-13.54	-274.46	506.41	474.81	31.61	16.022		
4,650.00	4,633.27	4,576.35	4,561.92	16.57	16.29	176.40	-13.93	-281.01	520.94	488.99	31.95	16.304		
4,700.00	4,682.65	4,624.20	4,609.31	16.77	16.47	176.41	-14.33	-287.57	535.47	503.17	32.30	16.580		
4,750.00	4,732.03	4,672.04	4,656.70	16.96	16.65	176.42	-14.72	-294.12	550.00	517.36	32.64	16.850		
4,800.00	4,781.41	4,719.88	4,704.09	17.16	16.84	176.42	-15.12	-300.67	564.53	531.54	32.99	17.114		
4,850.00	4,830.79	4,767.72	4,751.48	17.35	17.02	176.43	-15.52	-307.23	579.06	545.72	33.33	17.372		
4,900.00	4,880.17	4,815.57	4,798.87	17.55	17.21	176.44	-15.91	-313.78	593.59	559.91	33.68	17.625		
4,950.00	4,929.55	4,863.41	4,846.26	17.75	17.39	176.44	-16.31	-320.33	608.11	574.09	34.02	17.873		
5,000.00	4,978.93	4,911.25	4,893.65	17.94	17.57	176.45	-16.70	-326.89	622.64	588.27	34.37	18.116		
5,050.00	5,028.30	4,959.09	4,941.04	18.14	17.76	176.45	-17.10	-333.44	637.17	602.46	34.72	18.353		
5,100.00	5,077.68	5,006.94	4,988.43	18.34	17.94	176.46	-17.49	-339.99	651.70	616.64	35.06	18.586		
5,150.00	5,127.06	5,054.78	5,035.82	18.54	18.13	176.46	-17.89	-346.55	666.23	630.82	35.41	18.814		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 524H - Wellbore #1 - Permit Plan 1													Offset Site Error:	0.00 ft
Survey Program: O-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 (")	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,200.00	5,176.44	5,102.62	5,083.21	18.73	18.31	176.47	-18.29	-353.10	680.76	645.00	35.76	19.038		
5,250.00	5,225.82	5,150.46	5,130.60	18.93	18.50	176.47	-18.68	-359.85	695.29	659.18	36.11	19.257		
5,300.00	5,275.20	5,198.31	5,177.99	19.13	18.69	176.48	-19.08	-366.21	709.82	673.36	36.45	19.471		
5,350.00	5,324.58	5,246.15	5,225.38	19.33	18.87	176.48	-19.47	-372.76	724.35	687.54	36.80	19.682		
5,400.00	5,373.96	5,306.01	5,272.77	19.53	19.11	176.49	-19.87	-379.31	738.87	701.68	37.19	19.865		
5,450.00	5,423.34	5,341.83	5,320.16	19.73	19.24	176.49	-20.27	-385.86	753.40	715.90	37.50	20.091		
5,500.00	5,472.72	5,389.68	5,367.55	19.93	19.43	176.50	-20.66	-392.42	767.93	730.08	37.85	20.290		
5,550.00	5,522.10	5,437.52	5,414.94	20.13	19.62	176.50	-21.06	-398.97	782.46	744.26	38.20	20.485		
5,600.00	5,571.48	5,485.36	5,462.33	20.33	19.80	176.50	-21.45	-405.52	796.99	758.44	38.55	20.676		
5,650.00	5,620.86	5,533.20	5,509.72	20.53	19.99	176.51	-21.85	-412.08	811.52	772.62	38.90	20.863		
5,700.00	5,670.24	5,581.05	5,557.11	20.73	20.18	176.51	-22.24	-418.63	826.05	786.80	39.25	21.048		
5,750.00	5,719.61	5,628.89	5,604.50	20.93	20.37	176.51	-22.64	-425.18	840.58	800.98	39.60	21.229		
5,800.00	5,768.99	5,676.73	5,651.89	21.13	20.55	176.52	-23.04	-431.74	855.10	815.16	39.95	21.406		
5,850.00	5,818.37	5,724.57	5,699.28	21.33	20.74	176.52	-23.43	-438.29	869.63	829.34	40.30	21.581		
5,900.00	5,867.75	5,772.42	5,746.67	21.53	20.93	176.52	-23.83	-444.84	884.16	843.52	40.65	21.752		
5,950.00	5,917.13	5,820.26	5,794.06	21.73	21.12	176.52	-24.22	-451.40	898.69	857.69	41.00	21.920		
6,000.00	5,966.51	5,868.10	5,841.45	21.94	21.31	176.53	-24.62	-457.95	913.22	871.87	41.35	22.086		
6,050.00	6,015.89	5,915.94	5,888.84	22.14	21.49	176.53	-25.01	-464.50	927.75	886.05	41.70	22.248		
6,100.00	6,065.27	5,963.79	5,936.23	22.34	21.68	176.53	-25.41	-471.06	942.28	900.23	42.05	22.408		
6,150.00	6,114.65	6,011.63	5,983.62	22.54	21.87	176.54	-25.81	-477.61	956.81	914.40	42.40	22.565		
6,200.00	6,164.03	6,059.47	6,031.01	22.74	22.06	176.54	-26.20	-484.16	971.34	928.58	42.75	22.719		
6,250.00	6,213.41	6,107.31	6,078.40	22.95	22.25	176.54	-26.60	-490.71	985.86	942.76	43.11	22.871		
6,300.00	6,262.79	6,155.18	6,125.79	23.15	22.44	176.54	-26.99	-497.27	1,000.39	956.94	43.46	23.020		
6,350.00	6,312.17	6,203.00	6,173.18	23.35	22.62	176.54	-27.39	-503.82	1,014.92	971.11	43.81	23.166		
6,400.00	6,361.55	6,250.84	6,220.57	23.56	22.81	176.55	-27.79	-510.37	1,029.45	985.29	44.16	23.311		
6,450.00	6,410.93	6,298.68	6,267.96	23.76	23.00	176.55	-28.18	-516.93	1,043.98	999.47	44.51	23.452		
6,500.00	6,460.30	6,346.53	6,315.35	23.96	23.19	176.55	-28.58	-523.48	1,058.51	1,013.64	44.87	23.592		
6,550.00	6,509.68	6,405.63	6,362.74	24.17	23.43	176.55	-28.97	-530.03	1,073.04	1,027.78	45.26	23.708		
6,600.00	6,559.06	6,442.21	6,410.13	24.37	23.57	176.55	-29.37	-536.59	1,087.57	1,041.99	45.57	23.864		
6,650.00	6,608.44	6,490.05	6,457.52	24.57	23.76	176.56	-29.76	-543.14	1,102.10	1,056.17	45.93	23.997		
6,700.00	6,657.82	6,537.90	6,504.91	24.76	23.95	176.56	-30.16	-549.69	1,116.62	1,070.35	46.28	24.128		
6,750.00	6,707.20	6,585.74	6,552.30	24.98	24.14	176.56	-30.56	-556.25	1,131.15	1,084.52	46.63	24.257		
6,800.00	6,756.58	6,633.58	6,599.69	25.18	24.33	176.56	-30.95	-562.80	1,145.68	1,098.70	46.99	24.384		
6,850.00	6,805.96	6,681.43	6,647.08	25.39	24.52	176.56	-31.35	-569.35	1,160.21	1,112.87	47.34	24.509		
6,900.00	6,855.34	6,729.27	6,694.47	25.59	24.71	176.57	-31.74	-575.90	1,174.74	1,127.05	47.69	24.632		
6,950.00	6,904.72	6,777.11	6,741.86	25.80	24.90	176.57	-32.14	-582.46	1,189.27	1,141.22	48.05	24.753		
7,000.00	6,954.10	6,824.95	6,789.25	26.00	25.09	176.57	-32.54	-589.01	1,203.80	1,155.40	48.40	24.872		
7,050.00	7,003.48	6,872.80	6,836.64	26.21	25.28	176.57	-32.93	-595.56	1,218.33	1,169.57	48.75	24.989		
7,100.00	7,052.86	6,920.64	6,884.03	26.41	25.47	176.57	-33.33	-602.12	1,232.86	1,183.75	49.11	25.105		
7,150.00	7,102.24	6,968.48	6,931.42	26.61	25.66	176.57	-33.72	-608.67	1,247.39	1,197.92	49.46	25.219		
7,200.00	7,151.62	7,016.32	6,978.81	26.82	25.85	176.57	-34.12	-615.22	1,261.91	1,212.10	49.82	25.331		
7,250.00	7,200.99	7,064.17	7,026.20	27.02	26.04	176.58	-34.51	-621.78	1,276.44	1,226.27	50.17	25.442		
7,300.00	7,250.37	7,112.01	7,073.59	27.23	26.23	176.58	-34.91	-628.33	1,290.97	1,240.45	50.53	25.551		
7,350.00	7,299.75	7,159.85	7,120.98	27.43	26.42	176.58	-35.31	-634.88	1,305.50	1,254.62	50.88	25.658		
7,400.00	7,349.13	7,207.69	7,168.37	27.64	26.61	176.58	-35.70	-641.44	1,320.03	1,268.79	51.24	25.764		
7,450.00	7,398.51	7,255.54	7,215.76	27.84	26.80	176.58	-36.10	-647.99	1,334.56	1,282.97	51.59	25.868		
7,500.00	7,447.89	7,303.38	7,263.15	28.05	26.99	176.58	-36.49	-654.54	1,349.09	1,297.14	51.95	25.971		
7,550.00	7,497.27	7,351.22	7,310.54	28.26	27.18	176.58	-36.89	-661.10	1,363.62	1,311.32	52.30	26.073		
7,600.00	7,546.65	7,400.94	7,357.93	28.46	27.38	176.58	-37.29	-667.65	1,378.15	1,325.48	52.66	26.169		
7,650.00	7,596.03	7,448.91	7,405.32	28.67	27.57	176.59	-37.68	-674.20	1,392.67	1,339.66	53.01	26.271		
7,700.00	7,645.41	7,505.25	7,452.71	28.87	27.80	176.59	-38.08	-680.75	1,407.20	1,353.80	53.41	26.350		
7,750.00	7,694.79	7,542.59	7,500.10	29.08	27.95	176.59	-38.47	-687.31	1,421.73	1,368.01	53.72	26.464		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 524H - 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	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre +N/-S	+E/-W	Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)			
7,800.00	7,744.17	7,609.57	7,547.49	29.28	28.22	176.59	-38.87	-693.86	1,438.26	1,382.11	54.15	26.525		
7,850.00	7,793.55	7,638.28	7,594.88	29.49	28.33	176.59	-39.26	-700.41	1,450.79	1,396.36	54.43	26.652		
7,900.00	7,842.93	7,686.12	7,642.27	29.70	28.52	176.59	-39.66	-706.97	1,465.32	1,410.53	54.79	26.744		
7,950.00	7,892.31	7,733.96	7,689.66	29.90	28.71	176.59	-40.06	-713.52	1,479.85	1,424.70	55.15	26.835		
8,000.00	7,941.69	7,781.81	7,737.05	30.11	28.90	176.60	-40.45	-720.07	1,494.36	1,438.86	55.50	26.925		

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 525H - 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		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)					
0.00	0.00	0.30	-0.30	0.50	0.50	-90.50	-0.26	-29.97	29.97				
50.00	50.00	49.70	49.70	0.50	0.50	-90.50	-0.26	-29.97	29.97	28.96	1.01	29.779	
100.00	100.00	100.30	99.70	0.52	0.52	-90.50	-0.26	-29.97	29.97	28.94	1.04	28.936	
150.00	150.00	149.70	149.70	0.59	0.59	-90.50	-0.26	-29.97	29.97	28.79	1.18	25.401	
200.00	200.00	200.30	199.70	0.70	0.70	-90.50	-0.26	-29.97	29.97	28.57	1.40	21.332	
250.00	250.00	249.70	249.70	0.84	0.84	-90.50	-0.26	-29.97	29.97	28.30	1.67	17.898	
300.00	300.00	300.30	299.70	0.99	0.99	-90.50	-0.26	-29.97	29.97	28.00	1.98	15.171	
350.00	350.00	349.70	349.70	1.15	1.14	-90.50	-0.26	-29.97	29.97	27.68	2.29	13.088	
400.00	400.00	400.30	399.70	1.31	1.31	-90.50	-0.26	-29.97	29.97	27.35	2.62	11.443	
450.00	450.00	449.70	449.70	1.48	1.48	-90.50	-0.26	-29.97	29.97	27.02	2.95	10.154	
500.00	500.00	500.30	499.70	1.65	1.65	-90.50	-0.26	-29.97	29.97	26.68	3.29	9.101	
550.00	550.00	549.70	549.70	1.82	1.82	-90.50	-0.26	-29.97	29.97	26.34	3.63	8.247	
600.00	600.00	600.30	599.70	1.99	1.99	-90.50	-0.26	-29.97	29.97	25.99	3.98	7.526	
650.00	650.00	649.70	649.70	2.16	2.16	-90.50	-0.26	-29.97	29.97	25.64	4.33	6.925	
700.00	700.00	700.30	699.70	2.34	2.34	-90.50	-0.26	-29.97	29.97	25.29	4.68	6.405	
750.00	750.00	749.70	749.70	2.51	2.51	-90.50	-0.26	-29.97	29.97	24.94	5.03	5.960	
800.00	800.00	800.30	799.70	2.69	2.69	-90.50	-0.26	-29.97	29.97	24.59	5.38	5.569	
850.00	850.00	849.70	849.70	2.87	2.87	-90.50	-0.26	-29.97	29.97	24.24	5.73	5.228	
900.00	900.00	900.30	899.70	3.04	3.04	-90.50	-0.26	-29.97	29.97	23.88	6.09	4.923 Alert	
950.00	950.00	949.70	949.70	3.22	3.22	-90.50	-0.26	-29.97	29.97	23.53	6.44	4.654 Alert	
1,000.00	1,000.00	1,000.30	999.70	3.40	3.40	-90.50	-0.26	-29.97	29.97	23.17	6.80	4.410 Alert	
1,050.00	1,050.00	1,049.70	1,049.70	3.58	3.57	-90.50	-0.26	-29.97	29.97	22.82	7.15	4.192 Alert	
1,100.00	1,100.00	1,100.30	1,099.70	3.75	3.75	-90.50	-0.26	-29.97	29.97	22.46	7.51	3.993 Alert	
1,150.00	1,150.00	1,149.70	1,149.70	3.93	3.93	-90.50	-0.26	-29.97	29.97	22.11	7.86	3.813 Alert	
1,200.00	1,200.00	1,200.30	1,199.70	4.11	4.11	-90.50	-0.26	-29.97	29.97	21.75	8.22	3.647 Alert	
1,250.00	1,250.00	1,249.70	1,249.70	4.29	4.29	-90.50	-0.26	-29.97	29.97	21.40	8.57	3.497 Alert	
1,300.00	1,300.00	1,300.30	1,299.70	4.46	4.47	-90.50	-0.26	-29.97	29.97	21.04	8.93	3.356 Alert	
1,350.00	1,350.00	1,349.70	1,349.70	4.64	4.64	-90.50	-0.26	-29.97	29.97	20.69	9.28	3.228 Alert	
1,400.00	1,400.00	1,400.30	1,399.70	4.82	4.82	-90.50	-0.26	-29.97	29.97	20.33	9.64	3.108 Alert	
1,450.00	1,450.00	1,449.70	1,449.70	5.00	5.00	-90.50	-0.26	-29.97	29.97	19.97	10.00	2.998 Alert	
1,500.00	1,500.00	1,500.30	1,499.70	5.18	5.18	-90.50	-0.26	-29.97	29.97	19.62	10.36	2.894 Alert	
1,550.00	1,550.00	1,549.70	1,549.70	5.36	5.35	-90.50	-0.26	-29.97	29.97	19.26	10.71	2.798 Alert	
1,600.00	1,600.00	1,600.30	1,599.70	5.53	5.54	-90.50	-0.26	-29.97	29.97	18.90	11.07	2.708 Alert	
1,650.00	1,650.00	1,649.70	1,649.70	5.71	5.71	-90.50	-0.26	-29.97	29.97	18.55	11.42	2.623 Alert	
1,700.00	1,700.00	1,700.30	1,699.70	5.89	5.89	-90.50	-0.26	-29.97	29.97	18.19	11.78	2.543 Alert	
1,750.00	1,750.00	1,749.70	1,749.70	6.07	6.07	-90.50	-0.26	-29.97	29.97	17.83	12.14	2.469 Minor Risk	
1,800.00	1,800.00	1,800.30	1,799.70	6.25	6.25	-90.50	-0.26	-29.97	29.97	17.47	12.50	2.398 Minor Risk	
1,850.00	1,850.00	1,849.70	1,849.70	6.43	6.43	-90.50	-0.26	-29.97	29.97	17.12	12.85	2.332 Minor Risk	
1,900.00	1,900.00	1,900.30	1,899.70	6.61	6.61	-90.50	-0.26	-29.97	29.97	16.76	13.21	2.268 Minor Risk	
1,950.00	1,950.00	1,949.70	1,949.70	6.78	6.78	-90.50	-0.26	-29.97	29.97	16.40	13.57	2.209 Minor Risk	
2,000.00	2,000.00	2,000.30	1,999.70	6.96	6.96	-90.50	-0.26	-29.97	29.97	16.04	13.93	2.152 Minor Risk	
2,050.00	2,050.00	2,049.70	2,049.70	7.14	7.14	-90.50	-0.26	-29.97	29.97	15.69	14.28	2.098 Minor Risk	
2,100.00	2,100.00	2,100.30	2,099.70	7.32	7.32	-90.50	-0.26	-29.97	29.97	15.33	14.64	2.047 Minor Risk	
2,150.00	2,150.00	2,149.70	2,149.70	7.50	7.50	-90.50	-0.26	-29.97	29.97	14.97	15.00	1.998 Minor Risk	
2,200.00	2,200.00	2,200.30	2,199.70	7.68	7.68	-90.50	-0.26	-29.97	29.97	14.61	15.36	1.951 Minor Risk	
2,250.00	2,250.00	2,249.70	2,249.70	7.86	7.86	-90.50	-0.26	-29.97	29.97	14.26	15.71	1.907 Minor Risk	
2,300.00	2,300.00	2,300.30	2,299.70	8.04	8.04	-90.50	-0.26	-29.97	29.97	13.90	16.07	1.865 Minor Risk	
2,350.00	2,350.00	2,349.70	2,349.70	8.22	8.21	-90.50	-0.26	-29.97	29.97	13.54	16.43	1.824 Minor Risk	
2,400.00	2,400.00	2,400.30	2,399.70	8.39	8.40	-90.50	-0.26	-29.97	29.97	13.18	16.79	1.785 Minor Risk	
2,450.00	2,450.00	2,449.70	2,449.70	8.57	8.57	-90.50	-0.26	-29.97	29.97	12.83	17.15	1.748 Minor Risk	
2,500.00	2,500.00	2,500.30	2,499.70	8.75	8.75	-90.50	-0.26	-29.97	29.97	12.47	17.51	1.712 Minor Risk	
2,550.00	2,550.00	2,549.70	2,549.70	8.93	8.93	-90.50	-0.26	-29.97	29.97	12.11	17.86	1.678 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 Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 525H - 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		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
2,600.00	2,600.00	2,600.30	2,599.70	9.11	9.11	-80.50	-0.26	-29.97	29.97	11.75	18.22	1.645	Minor Risk	
2,650.00	2,650.00	2,649.70	2,649.70	9.29	9.29	-80.50	-0.26	-29.97	29.97	11.39	18.58	1.613	Minor Risk	
2,700.00	2,700.00	2,700.30	2,699.70	9.47	9.47	-80.50	-0.26	-29.97	29.97	11.03	18.94	1.583	Minor Risk, CC	
2,750.00	2,750.00	2,749.70	2,749.70	9.64	9.65	175.98	-0.26	-29.97	30.19	10.90	19.29	1.585	Minor Risk, ES, SF	
2,800.00	2,799.99	2,800.31	2,799.69	9.82	9.83	176.07	-0.26	-29.97	30.84	11.20	19.64	1.570	Minor Risk	
2,850.00	2,849.98	2,849.68	2,849.68	9.99	10.00	176.20	-0.26	-29.97	31.93	11.94	19.99	1.597	Minor Risk	
2,900.00	2,899.96	2,900.34	2,899.66	10.18	10.19	176.37	-0.26	-29.97	33.45	13.11	20.34	1.645	Minor Risk	
2,950.00	2,949.92	2,949.62	2,949.62	10.33	10.36	176.57	-0.26	-29.97	35.41	14.73	20.69	1.712	Minor Risk	
3,000.00	2,999.86	3,000.44	2,999.56	10.50	10.54	176.79	-0.26	-29.97	37.81	16.77	21.04	1.797	Minor Risk	
3,050.00	3,049.78	3,049.48	3,049.48	10.67	10.72	177.01	-0.26	-29.97	40.64	19.25	21.39	1.900	Minor Risk	
3,100.00	3,099.68	3,100.62	3,099.38	10.84	10.90	177.23	-0.26	-29.97	43.90	22.16	21.74	2.019	Minor Risk	
3,150.00	3,149.54	3,149.24	3,149.24	11.02	11.08	177.45	-0.26	-29.97	47.61	25.52	22.09	2.155	Minor Risk	
3,200.00	3,199.37	3,200.93	3,199.07	11.19	11.26	177.65	-0.26	-29.97	51.74	29.30	22.44	2.306	Minor Risk	
3,250.00	3,249.16	3,248.86	3,248.86	11.36	11.43	177.84	-0.26	-29.97	56.31	33.53	22.79	2.472	Minor Risk	
3,300.00	3,298.90	3,301.40	3,298.60	11.54	11.62	178.01	-0.26	-29.97	61.32	38.18	23.14	2.649	Alert	
3,350.00	3,348.61	3,348.31	3,348.31	11.72	11.79	178.17	-0.26	-29.97	66.76	43.28	23.48	2.843	Alert	
3,400.00	3,398.26	3,402.04	3,397.96	11.89	11.98	178.32	-0.26	-29.97	72.63	48.79	23.85	3.046	Alert	
3,450.00	3,447.86	3,447.56	3,447.56	12.07	12.14	178.45	-0.26	-29.97	78.94	54.76	24.18	3.264	Alert	
3,500.00	3,497.40	3,502.90	3,497.10	12.25	12.34	178.57	-0.26	-29.97	85.68	61.13	24.55	3.490	Alert	
3,550.00	3,546.89	3,546.59	3,546.59	12.43	12.50	178.68	-0.26	-29.97	92.85	67.97	24.88	3.732	Alert	
3,600.00	3,596.30	3,604.00	3,596.00	12.61	12.71	178.78	-0.26	-29.97	100.46	75.20	25.26	3.977	Alert	
3,650.00	3,645.68	3,645.38	3,645.38	12.79	12.85	178.87	-0.26	-29.97	108.31	82.73	25.58	4.234	Alert	
3,700.00	3,695.06	3,705.24	3,694.76	12.97	13.07	178.94	-0.26	-29.97	116.16	90.19	25.97	4.473	Alert	
3,750.00	3,744.44	3,744.14	3,744.14	13.16	13.21	179.01	-0.26	-29.97	124.02	97.74	26.28	4.719	Alert	
3,800.00	3,793.82	3,808.48	3,793.52	13.34	13.43	179.07	-0.26	-29.97	131.87	105.19	26.68	4.943	Alert	
3,850.00	3,843.20	3,842.90	3,842.90	13.53	13.56	179.12	-0.26	-29.97	139.72	112.74	26.98	5.179		
3,900.00	3,892.58	3,907.72	3,892.28	13.71	13.79	179.17	-0.26	-29.97	147.57	120.19	27.39	5.389		
3,950.00	3,941.96	3,941.66	3,941.66	13.90	13.91	179.21	-0.26	-29.97	155.43	127.75	27.68	5.615		
4,000.00	3,991.34	4,008.96	3,991.04	14.09	14.16	179.25	-0.26	-29.97	163.28	135.18	28.10	5.811		
4,050.00	4,040.72	4,040.42	4,040.42	14.27	14.27	179.28	-0.26	-29.97	171.13	142.75	28.38	6.029		
4,100.00	4,090.10	4,089.80	4,089.80	14.46	14.45	179.31	-0.26	-29.97	178.99	150.25	28.74	6.229		
4,150.00	4,139.48	4,139.18	4,139.18	14.65	14.62	179.34	-0.26	-29.97	186.84	157.75	29.09	6.423		
4,200.00	4,188.86	4,188.56	4,188.56	14.84	14.80	179.37	-0.26	-29.97	194.69	165.25	29.44	6.613		
4,250.00	4,238.24	4,237.94	4,237.94	15.03	14.98	179.39	-0.26	-29.97	202.55	172.75	29.79	6.798		
4,300.00	4,287.61	4,287.31	4,287.31	15.22	15.15	179.42	-0.26	-29.97	210.40	180.25	30.15	6.979		
4,350.00	4,336.99	4,336.69	4,336.69	15.41	15.33	179.44	-0.26	-29.97	218.25	187.75	30.50	7.156		
4,400.00	4,386.37	4,386.07	4,386.07	15.61	15.51	179.46	-0.26	-29.97	226.11	195.25	30.85	7.329		
4,450.00	4,435.75	4,435.45	4,435.45	15.80	15.68	179.48	-0.26	-29.97	233.96	202.75	31.21	7.497		
4,500.00	4,485.13	4,484.83	4,484.83	15.99	15.86	179.49	-0.26	-29.97	241.81	210.25	31.56	7.662		
4,550.00	4,534.51	4,534.21	4,534.21	16.19	16.04	179.51	-0.26	-29.97	249.67	217.75	31.91	7.823		
4,600.00	4,583.89	4,583.59	4,583.59	16.38	16.21	179.52	-0.26	-29.97	257.52	225.25	32.27	7.981		
4,650.00	4,633.27	4,632.97	4,632.97	16.57	16.39	179.54	-0.26	-29.97	265.37	232.75	32.62	8.135		
4,700.00	4,682.65	4,682.35	4,682.35	16.77	16.57	179.55	-0.26	-29.97	273.23	240.25	32.98	8.286		
4,750.00	4,732.03	4,731.73	4,731.73	16.96	16.75	179.56	-0.26	-29.97	281.08	247.75	33.33	8.433		
4,800.00	4,781.41	4,781.11	4,781.11	17.16	16.92	179.58	-0.26	-29.97	288.93	255.25	33.69	8.577		
4,850.00	4,830.79	4,830.49	4,830.49	17.35	17.10	179.59	-0.26	-29.97	296.79	262.75	34.04	8.719		
4,900.00	4,880.17	4,879.87	4,879.87	17.55	17.28	179.60	-0.26	-29.97	304.64	270.25	34.40	8.857		
4,950.00	4,929.55	4,929.25	4,929.25	17.75	17.45	179.61	-0.26	-29.97	312.49	277.74	34.75	8.992		
5,000.00	4,978.93	4,978.63	4,978.63	17.94	17.63	179.62	-0.26	-29.97	320.35	285.24	35.11	9.125		
5,050.00	5,028.30	5,028.00	5,028.00	18.14	17.81	179.63	-0.26	-29.97	328.20	292.74	35.46	9.255		
5,100.00	5,077.68	5,077.38	5,077.38	18.34	17.98	179.63	-0.26	-29.97	336.06	300.24	35.82	9.382		
5,150.00	5,127.06	5,126.76	5,126.76	18.54	18.16	179.64	-0.26	-29.97	343.91	307.73	36.17	9.507		

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 Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 525H - 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		
5,200.00	5,176.44	5,176.14	5,176.14	18.73	18.34	179.65	-0.26	-29.97	351.76	315.23	36.53	9.629		
5,250.00	5,225.82	5,225.52	5,225.52	18.93	18.51	179.66	-0.26	-29.97	359.62	322.73	36.89	9.749		
5,300.00	5,275.20	5,274.90	5,274.90	19.13	18.69	179.67	-0.26	-29.97	367.47	330.23	37.24	9.867		
5,350.00	5,324.58	5,324.28	5,324.28	19.33	18.87	179.67	-0.26	-29.97	375.32	337.72	37.60	9.982		
5,400.00	5,373.96	5,373.66	5,373.66	19.53	19.05	179.68	-0.26	-29.97	383.18	345.22	37.96	10.095		
5,450.00	5,423.34	5,423.04	5,423.04	19.73	19.22	179.69	-0.26	-29.97	391.03	352.72	38.31	10.208		
5,500.00	5,472.72	5,472.42	5,472.42	19.93	19.40	179.69	-0.26	-29.97	398.88	360.21	38.67	10.315		
5,550.00	5,522.10	5,521.80	5,521.80	20.13	19.58	179.70	-0.26	-29.97	406.74	367.71	39.03	10.422		
5,600.00	5,571.48	5,571.18	5,571.18	20.33	19.75	179.70	-0.26	-29.97	414.59	375.21	39.38	10.527		
5,650.00	5,620.88	5,620.56	5,620.56	20.53	19.93	179.71	-0.26	-29.97	422.45	382.70	39.74	10.630		
5,700.00	5,670.24	5,669.94	5,669.94	20.73	20.11	179.71	-0.26	-29.97	430.30	390.20	40.10	10.731		
5,750.00	5,719.61	5,719.31	5,719.31	20.93	20.28	179.72	-0.26	-29.97	438.15	397.70	40.46	10.830		
5,800.00	5,768.99	5,768.69	5,768.69	21.13	20.46	179.72	-0.26	-29.97	446.01	405.19	40.81	10.928		
5,850.00	5,818.37	5,818.07	5,818.07	21.33	20.64	179.73	-0.26	-29.97	453.86	412.69	41.17	11.023		
5,900.00	5,867.75	5,867.45	5,867.45	21.53	20.82	179.73	-0.26	-29.97	461.71	420.18	41.53	11.118		
5,950.00	5,917.13	5,916.83	5,916.83	21.73	20.99	179.74	-0.26	-29.97	469.57	427.68	41.89	11.210		
6,000.00	5,966.51	5,966.21	5,966.21	21.94	21.17	179.74	-0.26	-29.97	477.42	435.18	42.25	11.301		
6,050.00	6,015.89	6,014.64	6,014.64	22.14	21.34	179.74	-0.26	-29.99	485.29	442.69	42.60	11.393		
6,100.00	6,065.27	6,060.93	6,060.93	22.34	21.50	179.71	-0.56	-30.24	493.40	450.47	42.93	11.494		
6,150.00	6,114.65	6,107.11	6,107.10	22.54	21.66	179.64	-1.20	-30.80	501.81	458.55	43.25	11.602		
6,200.00	6,164.03	6,155.04	6,155.02	22.74	21.81	179.53	-2.16	-31.64	510.47	466.89	43.59	11.712		
6,250.00	6,213.41	6,204.27	6,204.23	22.95	21.97	179.42	-3.18	-32.54	519.17	475.24	43.93	11.819		
6,300.00	6,262.79	6,253.50	6,253.44	23.15	22.14	179.31	-4.20	-33.43	527.87	483.60	44.27	11.924		
6,350.00	6,312.17	6,302.73	6,302.64	23.35	22.30	179.20	-5.22	-34.33	536.57	491.96	44.61	12.027		
6,400.00	6,361.55	6,351.96	6,351.85	23.56	22.46	179.10	-6.23	-35.23	545.27	500.31	44.96	12.129		
6,450.00	6,410.93	6,401.18	6,401.06	23.76	22.62	179.00	-7.25	-36.12	553.97	508.67	45.30	12.229		
6,500.00	6,460.30	6,450.41	6,450.27	23.96	22.78	178.91	-8.27	-37.02	562.68	517.03	45.64	12.328		
6,550.00	6,509.68	6,500.36	6,499.48	24.17	22.95	178.82	-9.29	-37.92	571.38	525.39	45.99	12.424		
6,600.00	6,559.06	6,548.87	6,548.69	24.37	23.11	178.73	-10.31	-38.81	580.09	533.76	46.33	12.520		
6,650.00	6,608.44	6,601.91	6,597.90	24.57	23.28	178.64	-11.33	-39.71	588.80	542.11	46.69	12.611		
6,700.00	6,657.82	6,647.32	6,647.11	24.78	23.43	178.56	-12.34	-40.60	597.51	550.49	47.02	12.707		
6,750.00	6,707.20	6,703.45	6,696.32	24.98	23.62	178.47	-13.36	-41.50	606.22	558.83	47.39	12.792		
6,800.00	6,756.58	6,745.78	6,745.53	25.18	23.76	178.39	-14.38	-42.40	614.93	567.22	47.71	12.889		
6,850.00	6,805.96	6,804.99	6,794.74	25.39	23.96	178.32	-15.40	-43.29	623.65	575.56	48.09	12.968		
6,900.00	6,855.34	6,844.23	6,843.95	25.59	24.09	178.24	-16.42	-44.19	632.36	583.96	48.40	13.064		
6,950.00	6,904.72	6,906.54	6,893.16	25.80	24.30	178.17	-17.44	-45.08	641.08	592.28	48.79	13.139		
7,000.00	6,954.10	6,942.69	6,942.36	26.00	24.42	178.10	-18.45	-45.98	649.79	600.70	49.10	13.235		
7,050.00	7,003.48	7,008.08	6,991.57	26.21	24.64	178.03	-19.47	-46.88	658.51	609.02	49.50	13.304		
7,100.00	7,052.86	7,041.15	7,040.78	26.41	24.75	177.96	-20.49	-47.77	667.23	617.44	49.79	13.401		
7,150.00	7,102.24	7,109.63	7,089.99	26.61	24.98	177.89	-21.51	-48.67	675.95	625.75	50.20	13.465		
7,200.00	7,151.62	7,139.60	7,139.20	26.82	25.08	177.83	-22.53	-49.57	684.67	634.19	50.48	13.562		
7,250.00	7,200.99	7,188.83	7,188.41	27.02	25.24	177.77	-23.55	-50.46	693.39	642.56	50.83	13.641		
7,300.00	7,250.37	7,238.06	7,237.62	27.23	25.41	177.70	-24.56	-51.36	702.11	650.93	51.18	13.718		
7,350.00	7,299.75	7,287.29	7,286.83	27.43	25.57	177.64	-25.58	-52.25	710.84	659.31	51.53	13.795		
7,400.00	7,349.13	7,336.51	7,336.04	27.64	25.74	177.59	-26.60	-53.15	719.56	667.68	51.88	13.870		
7,450.00	7,398.51	7,385.74	7,385.25	27.84	25.90	177.53	-27.62	-54.05	728.28	676.06	52.23	13.945		
7,500.00	7,447.89	7,434.97	7,434.46	28.05	26.07	177.47	-28.64	-54.94	737.01	684.43	52.57	14.018		
7,550.00	7,497.27	7,484.20	7,483.67	28.26	26.24	177.42	-29.66	-55.84	745.73	692.81	52.92	14.091		
7,600.00	7,546.65	7,533.43	7,532.88	28.46	26.40	177.37	-30.67	-56.73	754.46	701.19	53.27	14.162		
7,650.00	7,596.03	7,582.65	7,582.09	28.67	26.57	177.32	-31.69	-57.63	763.19	709.56	53.62	14.233		
7,700.00	7,645.41	7,631.88	7,631.29	28.87	26.74	177.26	-32.71	-58.53	771.91	717.94	53.97	14.302		
7,750.00	7,694.79	7,681.11	7,680.50	29.08	26.90	177.22	-33.73	-59.42	780.64	726.32	54.32	14.371		

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 Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 525H - 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		Highside Toothface (")	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
7,800.00	7,744.17	7,730.34	7,729.71	29.28	27.07	177.17	-34.75	-60.32	789.37	734.70	54.67	14.438		
7,850.00	7,783.55	7,779.57	7,778.92	29.49	27.24	177.12	-35.77	-61.21	798.10	743.08	55.02	14.505		
7,900.00	7,842.93	7,828.79	7,828.13	29.70	27.40	177.07	-36.78	-62.11	806.83	751.46	55.37	14.571		
7,950.00	7,892.31	7,878.02	7,877.34	29.90	27.57	177.03	-37.80	-63.01	815.56	759.83	55.72	14.636		
8,000.00	7,941.69	7,927.25	7,926.55	30.11	27.74	176.99	-38.82	-63.90	824.28	768.20	56.07	14.700		
8,050.00	7,991.14	7,976.56	7,975.84	30.31	27.91	176.95	-39.84	-64.80	832.56	776.13	56.43	14.755		
8,100.00	8,040.68	8,025.96	8,025.23	30.51	28.07	176.91	-40.86	-65.70	840.20	783.42	56.78	14.798		
8,150.00	8,090.30	8,075.47	8,074.71	30.71	28.24	176.86	-41.89	-66.60	847.19	790.06	57.13	14.830		
8,200.00	8,140.00	8,125.06	8,124.28	30.90	28.41	176.82	-42.91	-67.50	853.53	796.06	57.48	14.850		
8,250.00	8,189.77	8,174.73	8,173.93	31.09	28.58	176.77	-43.94	-68.41	859.23	801.40	57.83	14.859		
8,300.00	8,239.60	8,224.46	8,223.65	31.28	28.75	176.72	-44.97	-69.31	864.28	806.10	58.18	14.856		
8,350.00	8,289.47	8,274.26	8,273.43	31.46	28.92	176.67	-46.00	-70.22	868.68	810.15	58.53	14.843		
8,400.00	8,339.39	8,324.11	8,323.26	31.64	29.09	176.62	-47.03	-71.13	872.43	813.55	58.88	14.818		
8,450.00	8,389.34	8,374.01	8,373.14	31.82	29.26	176.56	-48.06	-72.04	875.52	816.30	59.22	14.783		
8,500.00	8,439.32	8,423.94	8,423.05	31.99	29.43	176.50	-49.09	-72.94	877.97	818.40	59.57	14.738		
8,550.00	8,489.31	8,482.20	8,481.30	32.16	29.63	176.45	-50.01	-73.75	879.54	819.57	59.97	14.666		
8,600.00	8,539.31	8,539.91	8,539.01	32.33	29.83	-90.02	-50.26	-73.97	879.97	819.61	60.36	14.578		
8,650.00	8,589.31	8,589.91	8,589.01	32.49	30.01	-90.02	-50.26	-73.97	879.97	819.26	60.71	14.494		
8,700.00	8,639.31	8,639.91	8,639.01	32.65	30.19	-90.02	-50.26	-73.97	879.97	818.91	61.06	14.412		
8,750.00	8,689.31	8,689.91	8,689.01	32.82	30.37	-90.02	-50.26	-73.97	879.97	818.56	61.41	14.330		
8,800.00	8,739.31	8,739.91	8,739.01	32.98	30.55	-90.02	-50.26	-73.97	879.97	818.21	61.76	14.249		
8,850.00	8,789.31	8,789.91	8,789.01	33.15	30.72	-90.02	-50.26	-73.97	879.97	817.86	62.11	14.169		
8,900.00	8,839.31	8,839.91	8,839.01	33.31	30.90	-90.02	-50.26	-73.97	879.97	817.52	62.45	14.090		
8,902.09	8,841.40	8,842.00	8,841.10	33.32	30.91	90.35	-50.26	-73.97	879.97	817.50	62.47	14.086		
8,950.00	8,889.31	8,889.98	8,889.08	33.47	31.08	90.35	-50.30	-73.97	879.97	817.17	62.80	14.012		
9,000.00	8,939.22	8,940.45	8,939.45	33.63	31.25	90.35	-53.14	-73.95	879.97	816.83	63.14	13.937		
9,050.00	8,988.69	8,990.93	8,989.39	33.79	31.42	90.35	-60.41	-73.91	879.97	816.49	63.48	13.863		
9,100.00	9,037.34	9,041.39	9,038.48	33.95	31.59	90.34	-72.03	-73.83	879.97	816.16	63.81	13.790		
9,150.00	9,084.82	9,091.85	9,086.35	34.10	31.75	90.33	-87.92	-73.73	879.97	815.83	64.14	13.719		
9,200.00	9,130.75	9,142.30	9,132.63	34.25	31.91	90.32	-107.96	-73.60	879.97	815.50	64.47	13.649		
9,250.00	9,174.79	9,192.72	9,176.95	34.39	32.07	90.31	-131.98	-73.45	879.97	815.17	64.79	13.581		
9,300.00	9,216.60	9,243.13	9,218.97	34.53	32.24	90.29	-159.79	-73.27	879.96	814.85	65.12	13.513		
9,350.00	9,255.87	9,293.52	9,258.37	34.66	32.40	90.28	-191.18	-73.07	879.96	814.52	65.44	13.446		
9,400.00	9,292.29	9,343.88	9,294.84	34.79	32.56	90.26	-225.68	-72.85	879.96	814.19	65.77	13.380		
9,450.00	9,325.59	9,394.21	9,328.11	34.91	32.72	90.24	-263.62	-72.60	879.96	813.86	66.09	13.314		
9,500.00	9,355.51	9,444.51	9,357.92	35.03	32.89	90.21	-304.12	-72.34	879.96	813.53	66.43	13.247		
9,550.00	9,381.83	9,494.78	9,384.05	35.15	33.06	90.19	-347.04	-72.07	879.96	813.19	66.76	13.180		
9,600.00	9,404.35	9,545.01	9,406.30	35.28	33.23	90.16	-392.06	-71.78	879.95	812.85	67.11	13.113		
9,650.00	9,422.89	9,595.21	9,424.52	35.40	33.41	90.13	-438.81	-71.48	879.95	812.50	67.46	13.045		
9,700.00	9,437.31	9,645.36	9,438.56	35.54	33.59	90.10	-486.95	-71.17	879.95	812.14	67.81	12.976		
9,750.00	9,447.51	9,695.48	9,448.34	35.69	33.77	90.07	-536.08	-70.86	879.95	811.78	68.17	12.908		
9,800.00	9,453.41	9,745.56	9,453.78	35.85	33.95	90.04	-585.85	-70.54	879.95	811.41	68.54	12.839		
9,850.00	9,455.00	9,804.41	9,455.00	36.02	34.17	90.02	-635.85	-70.22	879.95	811.01	68.94	12.764		
9,900.00	9,455.00	9,845.59	9,455.00	36.20	34.34	90.02	-685.85	-69.90	879.95	810.65	69.30	12.698		
9,950.00	9,455.00	9,904.41	9,455.00	36.40	34.58	90.02	-735.85	-69.58	879.95	810.19	69.75	12.615		
10,000.00	9,455.00	9,945.59	9,455.00	36.60	34.77	90.02	-785.85	-69.26	879.95	809.79	70.16	12.542		
10,050.00	9,455.00	10,004.41	9,455.00	36.83	35.04	90.02	-835.85	-68.94	879.94	809.27	70.67	12.451		
10,100.00	9,455.00	10,045.59	9,455.00	37.06	35.26	90.02	-885.85	-68.62	879.94	808.82	71.13	12.371		
10,150.00	9,455.00	10,104.41	9,455.00	37.32	35.56	90.02	-935.85	-68.30	879.94	808.24	71.70	12.273		
10,200.00	9,455.00	10,145.59	9,455.00	37.58	35.80	90.02	-985.84	-67.98	879.94	807.74	72.20	12.187		
10,250.00	9,455.00	10,204.41	9,455.00	37.85	36.13	90.02	-1,035.84	-67.66	879.94	807.11	72.83	12.082		
10,300.00	9,455.00	10,245.59	9,455.00	38.14	36.39	90.02	-1,085.84	-67.34	879.94	806.57	73.37	11.992		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 525H - 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 +N/-S	+E/-W	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)			
10,350.00	9,455.00	10,304.41	9,455.00	38.44	36.75	90.02	-1,135.84	-67.02	879.94	805.89	74.06	11.882		
10,400.00	9,455.00	10,345.59	9,455.00	38.75	37.03	90.02	-1,185.84	-68.70	879.94	805.30	74.64	11.789		
10,450.00	9,455.00	10,404.41	9,455.00	39.07	37.42	90.02	-1,235.84	-66.38	879.94	804.57	75.37	11.674		
10,500.00	9,455.00	10,445.59	9,455.00	39.40	37.71	90.02	-1,285.84	-66.06	879.94	803.94	76.00	11.578		
10,550.00	9,455.00	10,504.41	9,455.00	39.75	38.13	90.02	-1,335.84	-65.74	879.94	803.16	76.78	11.460		
10,600.00	9,455.00	10,545.59	9,455.00	40.10	38.44	90.02	-1,385.84	-65.42	879.94	802.49	77.45	11.362		
10,650.00	9,455.00	10,604.41	9,455.00	40.47	38.88	90.02	-1,435.83	-65.10	879.94	801.67	78.27	11.242		
10,700.00	9,455.00	10,645.59	9,455.00	40.84	39.21	90.02	-1,485.83	-64.78	879.94	800.96	78.98	11.142		
10,750.00	9,455.00	10,704.41	9,455.00	41.23	39.67	90.02	-1,535.83	-64.46	879.94	800.10	79.84	11.021		
10,800.00	9,455.00	10,745.59	9,455.00	41.62	40.01	90.02	-1,585.83	-64.14	879.94	799.36	80.58	10.920		
10,850.00	9,455.00	10,804.41	9,455.00	42.02	40.50	90.02	-1,635.83	-63.82	879.94	798.45	81.48	10.799		
10,900.00	9,455.00	10,845.59	9,455.00	42.43	40.86	90.02	-1,685.83	-63.50	879.94	797.68	82.26	10.698		
10,950.00	9,455.00	10,904.41	9,455.00	42.85	41.38	90.02	-1,735.83	-63.18	879.93	796.74	83.20	10.577		
11,000.00	9,455.00	10,945.59	9,455.00	43.28	41.73	90.02	-1,785.83	-62.86	879.93	795.94	84.00	10.476		
11,050.00	9,455.00	11,004.41	9,455.00	43.72	42.26	90.02	-1,835.83	-62.54	879.93	794.96	84.98	10.355		
11,100.00	9,455.00	11,045.59	9,455.00	44.16	42.64	90.02	-1,885.83	-62.22	879.93	794.13	85.81	10.255		
11,150.00	9,455.00	11,104.41	9,455.00	44.61	43.19	90.02	-1,935.82	-61.90	879.93	793.12	86.81	10.136		
11,200.00	9,455.00	11,145.59	9,455.00	45.06	43.58	90.02	-1,985.82	-61.58	879.93	792.26	87.67	10.037		
11,250.00	9,455.00	11,204.41	9,455.00	45.53	44.14	90.02	-2,035.82	-61.26	879.93	791.22	88.71	9.919		
11,300.00	9,455.00	11,245.59	9,455.00	46.00	44.54	90.02	-2,085.82	-60.93	879.93	790.34	89.59	9.821		
11,350.00	9,455.00	11,304.41	9,455.00	46.48	45.12	90.02	-2,135.82	-60.61	879.93	789.27	90.66	9.705		
11,400.00	9,455.00	11,345.59	9,455.00	46.96	45.54	90.02	-2,185.82	-60.29	879.93	788.36	91.57	9.609		
11,450.00	9,455.00	11,404.41	9,455.00	47.46	46.13	90.02	-2,235.82	-59.97	879.93	787.26	92.67	9.496		
11,500.00	9,455.00	11,445.59	9,455.00	47.95	46.55	90.02	-2,285.82	-59.65	879.93	786.33	93.59	9.402		
11,550.00	9,455.00	11,504.41	9,455.00	48.46	47.16	90.02	-2,335.82	-59.33	879.93	785.21	94.72	9.290		
11,600.00	9,455.00	11,545.59	9,455.00	48.96	47.59	90.02	-2,385.82	-59.01	879.93	784.26	95.66	9.198		
11,650.00	9,455.00	11,604.41	9,455.00	49.48	48.21	90.02	-2,435.81	-58.69	879.93	783.12	96.81	9.089		
11,700.00	9,455.00	11,645.59	9,455.00	50.00	48.65	90.02	-2,485.81	-58.37	879.93	782.15	97.78	8.999		
11,750.00	9,455.00	11,704.41	9,455.00	50.53	49.29	90.02	-2,535.81	-58.05	879.93	780.98	98.95	8.893		
11,800.00	9,455.00	11,745.59	9,455.00	51.05	49.73	90.02	-2,585.81	-57.73	879.92	779.99	99.93	8.805		
11,850.00	9,455.00	11,804.41	9,455.00	51.59	50.38	90.02	-2,635.81	-57.41	879.92	778.80	101.12	8.702		
11,900.00	9,455.00	11,845.59	9,455.00	52.13	50.83	90.02	-2,685.81	-57.09	879.92	777.80	102.12	8.616		
11,950.00	9,455.00	11,904.41	9,455.00	52.67	51.49	90.02	-2,735.81	-56.77	879.92	776.59	103.33	8.516		
12,000.00	9,455.00	11,945.59	9,455.00	53.22	51.95	90.02	-2,785.81	-56.45	879.92	775.57	104.35	8.432		
12,050.00	9,455.00	12,004.41	9,455.00	53.77	52.62	90.02	-2,835.81	-56.13	879.92	774.35	105.58	8.334		
12,100.00	9,455.00	12,045.59	9,455.00	54.33	53.09	90.02	-2,885.81	-55.81	879.92	773.31	106.61	8.254		
12,150.00	9,455.00	12,104.41	9,455.00	54.89	53.76	90.02	-2,935.80	-55.49	879.92	772.07	107.85	8.158		
12,200.00	9,455.00	12,145.59	9,455.00	55.45	54.24	90.02	-2,985.80	-55.17	879.92	771.02	108.90	8.080		
12,250.00	9,455.00	12,204.41	9,455.00	56.02	54.92	90.02	-3,035.80	-54.85	879.92	769.76	110.16	7.988		
12,300.00	9,455.00	12,245.59	9,455.00	56.59	55.40	90.02	-3,085.80	-54.53	879.92	768.70	111.22	7.911		
12,350.00	9,455.00	12,304.41	9,455.00	57.17	56.09	90.02	-3,135.80	-54.21	879.92	767.42	112.50	7.822		
12,400.00	9,455.00	12,345.59	9,455.00	57.75	56.58	90.02	-3,185.80	-53.89	879.92	766.35	113.57	7.748		
12,450.00	9,455.00	12,404.41	9,455.00	58.33	57.28	90.02	-3,235.80	-53.57	879.92	765.06	114.86	7.661		
12,500.00	9,455.00	12,445.59	9,455.00	58.92	57.77	90.02	-3,285.80	-53.25	879.92	763.97	115.94	7.589		
12,550.00	9,455.00	12,504.41	9,455.00	59.51	58.47	90.02	-3,335.80	-52.93	879.92	762.67	117.25	7.505		
12,600.00	9,455.00	12,545.59	9,455.00	60.10	58.97	90.02	-3,385.79	-52.61	879.92	761.57	118.34	7.435		
12,650.00	9,455.00	12,604.41	9,455.00	60.70	59.68	90.02	-3,435.79	-52.29	879.92	760.26	119.66	7.354		
12,700.00	9,455.00	12,645.59	9,455.00	61.29	60.18	90.02	-3,485.79	-51.97	879.91	759.15	120.76	7.286		
12,750.00	9,455.00	12,704.41	9,455.00	61.89	60.90	90.02	-3,535.79	-51.65	879.91	757.82	122.09	7.207		
12,800.00	9,455.00	12,745.59	9,455.00	62.50	61.41	90.02	-3,585.79	-51.33	879.91	756.71	123.21	7.142		
12,850.00	9,455.00	12,804.41	9,455.00	63.10	62.13	90.02	-3,635.79	-51.01	879.91	755.37	124.54	7.065		
12,900.00	9,455.00	12,845.59	9,455.00	63.71	62.64	90.02	-3,685.79	-50.69	879.91	754.25	125.67	7.002		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 525H - 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		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
12,950.00	9,455.00	12,904.41	9,455.00	64.32	63.37	90.02	-3,735.79	-50.37	879.91	752.90	127.02	6.928		
13,000.00	9,455.00	12,945.59	9,455.00	64.94	63.89	90.02	-3,785.79	-50.05	879.91	751.76	128.15	6.868		
13,050.00	9,455.00	13,004.41	9,455.00	65.55	64.62	90.02	-3,835.79	-49.73	879.91	750.40	129.51	6.794		
13,100.00	9,455.00	13,045.59	9,455.00	66.17	65.14	90.02	-3,885.78	-49.41	879.91	749.26	130.65	6.735		
13,150.00	9,455.00	13,104.41	9,455.00	66.79	65.88	90.02	-3,935.78	-49.09	879.91	747.89	132.02	6.665		
13,200.00	9,455.00	13,145.59	9,455.00	67.41	66.40	90.02	-3,985.78	-48.77	879.91	746.74	133.16	6.608		
13,250.00	9,455.00	13,204.41	9,455.00	68.04	67.14	90.02	-4,035.78	-48.45	879.91	745.37	134.54	6.540		
13,300.00	9,455.00	13,245.59	9,455.00	68.66	67.67	90.02	-4,085.78	-48.13	879.91	744.21	135.70	6.484		
13,350.00	9,455.00	13,304.41	9,455.00	69.29	68.42	90.02	-4,135.78	-47.81	879.91	742.83	137.08	6.419		
13,400.00	9,455.00	13,345.59	9,455.00	69.92	68.95	90.02	-4,185.78	-47.49	879.91	741.66	138.24	6.365		
13,450.00	9,455.00	13,404.41	9,455.00	70.56	69.70	90.02	-4,235.78	-47.17	879.91	740.27	139.64	6.301		
13,500.00	9,455.00	13,445.59	9,455.00	71.19	70.23	90.02	-4,285.78	-46.85	879.91	739.10	140.81	6.249		
13,550.00	9,455.00	13,504.41	9,455.00	71.83	70.99	90.02	-4,335.78	-46.53	879.90	737.70	142.20	6.188		
13,600.00	9,455.00	13,545.59	9,455.00	72.46	71.52	90.02	-4,385.77	-46.21	879.90	736.52	143.38	6.137		
13,650.00	9,455.00	13,604.41	9,455.00	73.10	72.28	90.02	-4,435.77	-45.89	879.90	735.12	144.79	6.077		
13,700.00	9,455.00	13,645.59	9,455.00	73.75	72.82	90.02	-4,485.77	-45.57	879.90	733.94	145.97	6.028		
13,750.00	9,455.00	13,704.41	9,455.00	74.39	73.58	90.02	-4,535.77	-45.25	879.90	732.52	147.38	5.970		
13,800.00	9,455.00	13,745.59	9,455.00	75.03	74.12	90.02	-4,585.77	-44.93	879.90	731.33	148.57	5.923		
13,850.00	9,455.00	13,804.41	9,455.00	75.68	74.89	90.02	-4,635.77	-44.61	879.90	729.91	149.99	5.866		
13,900.00	9,455.00	13,845.59	9,455.00	76.33	75.43	90.02	-4,685.77	-44.29	879.90	728.72	151.18	5.820		
13,950.00	9,455.00	13,904.41	9,455.00	76.98	76.20	90.02	-4,735.77	-43.97	879.90	727.30	152.61	5.766		
14,000.00	9,455.00	13,945.59	9,455.00	77.63	76.74	90.02	-4,785.77	-43.65	879.90	726.10	153.80	5.721		
14,050.00	9,455.00	14,004.41	9,455.00	78.28	77.51	90.02	-4,835.77	-43.33	879.90	724.67	155.23	5.668		
14,100.00	9,455.00	14,045.59	9,455.00	78.93	78.06	90.02	-4,885.76	-43.01	879.90	723.46	156.43	5.625		
14,150.00	9,455.00	14,104.41	9,455.00	79.59	78.84	90.02	-4,935.76	-42.68	879.90	722.03	157.87	5.574		
14,200.00	9,455.00	14,145.59	9,455.00	80.24	79.38	90.02	-4,985.76	-42.36	879.90	720.82	159.08	5.531		
14,250.00	9,455.00	14,204.41	9,455.00	80.90	80.16	90.02	-5,035.76	-42.04	879.90	719.38	160.52	5.482		
14,300.00	9,455.00	14,245.59	9,455.00	81.56	80.71	90.02	-5,085.76	-41.72	879.90	718.17	161.73	5.441		
14,350.00	9,455.00	14,304.41	9,455.00	82.22	81.49	90.02	-5,135.76	-41.40	879.90	716.72	163.18	5.392		
14,400.00	9,455.00	14,345.59	9,455.00	82.88	82.04	90.02	-5,185.76	-41.08	879.90	715.51	164.39	5.352		
14,450.00	9,455.00	14,404.41	9,455.00	83.54	82.83	90.02	-5,235.76	-40.76	879.89	714.05	165.84	5.306		
14,500.00	9,455.00	14,445.59	9,455.00	84.20	83.38	90.02	-5,285.76	-40.44	879.89	712.83	167.06	5.267		
14,550.00	9,455.00	14,504.41	9,455.00	84.86	84.17	90.02	-5,335.76	-40.12	879.89	711.38	168.52	5.221		
14,600.00	9,455.00	14,545.59	9,455.00	85.53	84.72	90.02	-5,385.75	-39.80	879.89	710.16	169.74	5.184		
14,650.00	9,455.00	14,604.41	9,455.00	86.20	85.51	90.02	-5,435.75	-39.48	879.89	708.70	171.20	5.140		
14,700.00	9,455.00	14,645.59	9,455.00	86.86	86.06	90.02	-5,485.75	-39.16	879.89	707.47	172.42	5.103		
14,750.00	9,455.00	14,704.41	9,455.00	87.53	86.86	90.02	-5,535.75	-38.84	879.89	706.00	173.89	5.060		
14,800.00	9,455.00	14,745.59	9,455.00	88.20	87.41	90.02	-5,585.75	-38.52	879.89	704.78	175.11	5.025		
14,850.00	9,455.00	14,804.41	9,455.00	88.87	88.21	90.02	-5,635.75	-38.20	879.89	703.31	176.58	4.983 Alert		
14,900.00	9,455.00	14,845.59	9,455.00	89.54	88.76	90.02	-5,685.75	-37.88	879.89	702.08	177.81	4.948 Alert		
14,950.00	9,455.00	14,904.41	9,455.00	90.21	89.56	90.02	-5,735.75	-37.56	879.89	700.60	179.29	4.908 Alert		
15,000.00	9,455.00	14,945.59	9,455.00	90.88	90.12	90.02	-5,785.75	-37.24	879.89	699.37	180.52	4.874 Alert		
15,050.00	9,455.00	15,004.41	9,455.00	91.56	90.92	90.02	-5,835.74	-36.92	879.89	697.89	182.00	4.835 Alert		
15,100.00	9,455.00	15,045.59	9,455.00	92.23	91.48	90.02	-5,885.74	-36.60	879.89	696.65	183.23	4.802 Alert		
15,150.00	9,455.00	15,104.41	9,455.00	92.91	92.28	90.02	-5,935.74	-36.28	879.89	695.17	184.71	4.764 Alert		
15,200.00	9,455.00	15,145.59	9,455.00	93.58	92.84	90.02	-5,985.74	-35.96	879.89	693.93	185.95	4.732 Alert		
15,250.00	9,455.00	15,204.41	9,455.00	94.26	93.64	90.02	-6,035.74	-35.64	879.89	692.45	187.43	4.694 Alert		
15,300.00	9,455.00	15,245.59	9,455.00	94.94	94.20	90.02	-6,085.74	-35.32	879.88	691.21	188.68	4.663 Alert		
15,350.00	9,455.00	15,304.41	9,455.00	95.61	95.00	90.02	-6,135.74	-35.00	879.88	689.72	190.16	4.627 Alert		
15,400.00	9,455.00	15,345.59	9,455.00	96.29	95.57	90.02	-6,185.74	-34.68	879.88	688.48	191.41	4.597 Alert		
15,450.00	9,455.00	15,404.41	9,455.00	96.97	96.37	90.02	-6,235.74	-34.36	879.88	686.99	192.90	4.561 Alert		
15,500.00	9,455.00	15,445.59	9,455.00	97.65	96.94	90.02	-6,285.74	-34.04	879.88	685.74	194.14	4.532 Alert		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 525H - 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		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset		+N/-S (ft)	+E/-W (ft)						
15,550.00	9,455.00	15,504.41	9,455.00	98.33	97.74	90.02	-6,335.73	-33.72	879.88	684.25	195.63	4.498	Alert	
15,600.00	9,455.00	15,545.59	9,455.00	99.02	98.31	90.02	-6,385.73	-33.40	879.88	683.00	196.88	4.469	Alert	
15,650.00	9,455.00	15,604.41	9,455.00	99.70	99.12	90.02	-6,435.73	-33.08	879.88	681.50	198.38	4.435	Alert	
15,700.00	9,455.00	15,645.59	9,455.00	100.38	99.68	90.02	-6,485.73	-32.76	879.88	680.25	199.63	4.408	Alert	
15,750.00	9,455.00	15,704.41	9,455.00	101.07	100.49	90.02	-6,535.73	-32.44	879.88	678.75	201.13	4.375	Alert	
15,800.00	9,455.00	15,745.59	9,455.00	101.75	101.06	90.02	-6,585.73	-32.12	879.88	677.50	202.38	4.348	Alert	
15,850.00	9,455.00	15,804.41	9,455.00	102.43	101.87	90.02	-6,635.73	-31.80	879.88	676.00	203.88	4.316	Alert	
15,900.00	9,455.00	15,845.59	9,455.00	103.12	102.44	90.02	-6,685.73	-31.48	879.88	674.74	205.14	4.289	Alert	
15,950.00	9,455.00	15,904.41	9,455.00	103.81	103.25	90.02	-6,735.73	-31.16	879.88	673.24	206.64	4.258	Alert	
16,000.00	9,455.00	15,945.59	9,455.00	104.49	103.82	90.02	-6,785.73	-30.84	879.88	671.98	207.89	4.232	Alert	
16,050.00	9,455.00	16,004.41	9,455.00	105.18	104.63	90.02	-6,835.72	-30.52	879.88	670.48	209.40	4.202	Alert	
16,100.00	9,455.00	16,045.59	9,455.00	105.87	105.20	90.02	-6,885.72	-30.20	879.88	669.22	210.66	4.177	Alert	
16,150.00	9,455.00	16,104.41	9,455.00	106.56	106.02	90.02	-6,935.72	-29.88	879.88	667.71	212.16	4.147	Alert	
16,200.00	9,455.00	16,145.59	9,455.00	107.25	106.59	90.02	-6,985.72	-29.56	879.87	666.45	213.43	4.123	Alert	
16,250.00	9,455.00	16,204.41	9,455.00	107.93	107.40	90.02	-7,035.72	-29.24	879.87	664.94	214.93	4.094	Alert	
16,300.00	9,455.00	16,245.59	9,455.00	108.62	107.98	90.02	-7,085.72	-28.92	879.87	663.68	216.20	4.070	Alert	
16,350.00	9,455.00	16,304.41	9,455.00	109.32	108.79	90.02	-7,135.72	-28.60	879.87	662.17	217.71	4.042	Alert	
16,400.00	9,455.00	16,345.59	9,455.00	110.01	109.36	90.02	-7,185.72	-28.28	879.87	660.90	218.97	4.018	Alert	
16,450.00	9,455.00	16,404.41	9,455.00	110.70	110.18	90.02	-7,235.72	-27.96	879.87	659.39	220.48	3.991	Alert	
16,500.00	9,455.00	16,445.59	9,455.00	111.39	110.76	90.02	-7,285.72	-27.64	879.87	658.12	221.75	3.968	Alert	
16,550.00	9,455.00	16,504.41	9,455.00	112.08	111.57	90.02	-7,335.71	-27.32	879.87	656.61	223.27	3.941	Alert	
16,600.00	9,455.00	16,545.59	9,455.00	112.77	112.15	90.02	-7,385.71	-27.00	879.87	655.34	224.53	3.919	Alert	
16,650.00	9,455.00	16,604.41	9,455.00	113.47	112.97	90.02	-7,435.71	-26.68	879.87	653.82	226.05	3.892	Alert	
16,700.00	9,455.00	16,645.59	9,455.00	114.16	113.54	90.02	-7,485.71	-26.36	879.87	652.55	227.32	3.871	Alert	
16,750.00	9,455.00	16,704.41	9,455.00	114.86	114.36	90.02	-7,535.71	-26.04	879.87	651.03	228.84	3.845	Alert	
16,800.00	9,455.00	16,745.59	9,455.00	115.55	114.84	90.02	-7,585.71	-25.72	879.87	649.76	230.11	3.824	Alert	
16,850.00	9,455.00	16,804.41	9,455.00	116.25	115.76	90.02	-7,635.71	-25.40	879.87	648.24	231.63	3.799	Alert	
16,900.00	9,455.00	16,845.59	9,455.00	116.94	116.33	90.02	-7,685.71	-25.08	879.87	646.97	232.90	3.778	Alert	
16,950.00	9,455.00	16,904.41	9,455.00	117.64	117.16	90.02	-7,735.71	-24.75	879.87	645.44	234.42	3.753	Alert	
17,000.00	9,455.00	16,945.59	9,455.00	118.33	117.73	90.02	-7,785.70	-24.43	879.87	644.17	235.70	3.733	Alert	
17,050.00	9,455.00	17,004.41	9,455.00	119.03	118.56	90.02	-7,835.70	-24.11	879.87	642.65	237.22	3.709	Alert	
17,100.00	9,455.00	17,045.59	9,455.00	119.73	119.13	90.02	-7,885.70	-23.79	879.86	641.37	238.48	3.689	Alert	
17,150.00	9,455.00	17,104.41	9,455.00	120.42	119.96	90.02	-7,935.70	-23.47	879.86	639.85	240.02	3.666	Alert	
17,200.00	9,455.00	17,145.59	9,455.00	121.12	120.53	90.02	-7,985.70	-23.15	879.86	638.57	241.29	3.646	Alert	
17,250.00	9,455.00	17,204.41	9,455.00	121.82	121.38	90.02	-8,035.70	-22.83	879.86	637.04	242.82	3.624	Alert	
17,300.00	9,455.00	17,245.59	9,455.00	122.52	121.94	90.02	-8,085.70	-22.51	879.86	635.76	244.10	3.605	Alert	
17,350.00	9,455.00	17,304.41	9,455.00	123.22	122.76	90.02	-8,135.70	-22.19	879.86	634.24	245.62	3.582	Alert	
17,400.00	9,455.00	17,345.59	9,455.00	123.92	123.34	90.02	-8,185.70	-21.87	879.86	632.96	246.90	3.564	Alert	
17,450.00	9,455.00	17,404.41	9,455.00	124.62	124.17	90.02	-8,235.70	-21.55	879.86	631.43	248.43	3.542	Alert	
17,500.00	9,455.00	17,445.59	9,455.00	125.32	124.75	90.02	-8,285.69	-21.23	879.86	630.15	249.71	3.524	Alert	
17,550.00	9,455.00	17,504.41	9,455.00	126.02	125.57	90.02	-8,335.69	-20.91	879.86	628.62	251.24	3.502	Alert	
17,600.00	9,455.00	17,545.59	9,455.00	126.72	126.15	90.02	-8,385.69	-20.59	879.86	627.34	252.52	3.484	Alert	
17,650.00	9,455.00	17,604.41	9,455.00	127.42	126.98	90.02	-8,435.69	-20.27	879.86	625.81	254.05	3.463	Alert	
17,700.00	9,455.00	17,645.59	9,455.00	128.12	127.56	90.02	-8,485.69	-19.95	879.86	624.52	255.34	3.446	Alert	
17,750.00	9,455.00	17,704.41	9,455.00	128.82	128.39	90.02	-8,535.69	-19.63	879.86	622.99	256.87	3.425	Alert	
17,800.00	9,455.00	17,745.59	9,455.00	129.52	128.97	90.02	-8,585.69	-19.31	879.86	621.71	258.15	3.408	Alert	
17,850.00	9,455.00	17,804.41	9,455.00	130.22	129.80	90.02	-8,635.69	-18.99	879.86	620.17	259.68	3.388	Alert	
17,900.00	9,455.00	17,845.59	9,455.00	130.93	130.38	90.02	-8,685.69	-18.67	879.86	618.89	260.97	3.371	Alert	
17,950.00	9,455.00	17,904.41	9,455.00	131.63	131.21	90.02	-8,735.69	-18.35	879.85	617.35	262.50	3.352	Alert	
18,000.00	9,455.00	17,945.59	9,455.00	132.33	131.79	90.02	-8,785.68	-18.03	879.85	616.07	263.79	3.335	Alert	
18,050.00	9,455.00	18,004.41	9,455.00	133.03	132.62	90.02	-8,835.68	-17.71	879.85	614.53	265.32	3.316	Alert	
18,100.00	9,455.00	18,045.59	9,455.00	133.74	133.20	90.02	-8,885.68	-17.39	879.85	613.24	266.61	3.300	Alert	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Alley Cat 17-20 Fed Com 525H - 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)	Minimum Separation (ft)	Separation Factor		
18,150.00	9,455.00	18,104.41	9,455.00	134.44	134.03	90.02	-8,935.68	-17.07	879.85	811.71	268.15	3.281	Alert	
18,200.00	9,455.00	18,145.59	9,455.00	135.14	134.61	90.02	-8,985.68	-16.75	879.85	610.42	269.43	3.266	Alert	
18,250.00	9,455.00	18,204.41	9,455.00	135.85	135.44	90.02	-9,035.68	-16.43	879.85	608.88	270.97	3.247	Alert	
18,300.00	9,455.00	18,245.59	9,455.00	136.55	136.03	90.02	-9,085.68	-16.11	879.85	607.59	272.26	3.232	Alert	
18,350.00	9,455.00	18,304.41	9,455.00	137.26	136.86	90.02	-9,135.68	-15.79	879.85	606.05	273.80	3.213	Alert	
18,400.00	9,455.00	18,345.59	9,455.00	137.96	137.44	90.02	-9,185.68	-15.47	879.85	604.76	275.09	3.198	Alert	
18,450.00	9,455.00	18,404.41	9,455.00	138.67	138.27	90.02	-9,235.68	-15.15	879.85	603.22	276.63	3.181	Alert	
18,500.00	9,455.00	18,445.59	9,455.00	139.37	138.86	90.02	-9,285.67	-14.83	879.85	601.93	277.92	3.166	Alert	
18,550.00	9,455.00	18,504.41	9,455.00	140.08	139.69	90.02	-9,335.67	-14.51	879.85	600.39	279.46	3.148	Alert	
18,600.00	9,455.00	18,545.59	9,455.00	140.79	140.27	90.02	-9,385.67	-14.19	879.85	599.10	280.75	3.134	Alert	
18,650.00	9,455.00	18,604.41	9,455.00	141.49	141.11	90.02	-9,435.67	-13.87	879.85	597.56	282.29	3.117	Alert	
18,700.00	9,455.00	18,645.59	9,455.00	142.20	141.69	90.02	-9,485.67	-13.55	879.85	596.27	283.58	3.103	Alert	
18,750.00	9,455.00	18,704.41	9,455.00	142.91	142.52	90.02	-9,535.67	-13.23	879.85	594.72	285.12	3.086	Alert	
18,800.00	9,455.00	18,745.59	9,455.00	143.61	143.11	90.02	-9,585.67	-12.91	879.85	593.43	286.42	3.072	Alert	
18,850.00	9,455.00	18,804.41	9,455.00	144.32	143.84	90.02	-9,635.67	-12.59	879.84	591.89	287.96	3.055	Alert	
18,900.00	9,455.00	18,845.59	9,455.00	145.03	144.53	90.02	-9,685.67	-12.27	879.84	590.59	289.25	3.042	Alert	
18,950.00	9,455.00	18,904.41	9,455.00	145.73	145.36	90.02	-9,735.66	-11.95	879.84	589.05	290.80	3.026	Alert	
19,000.00	9,455.00	18,945.59	9,455.00	146.44	145.95	90.02	-9,785.66	-11.63	879.84	587.75	292.09	3.012	Alert	
19,050.00	9,455.00	19,004.41	9,455.00	147.15	146.78	90.02	-9,835.66	-11.31	879.84	586.21	293.63	2.996	Alert	
19,100.00	9,455.00	19,045.59	9,455.00	147.86	147.37	90.02	-9,885.66	-10.99	879.84	584.91	294.93	2.983	Alert	
19,150.00	9,455.00	19,104.41	9,455.00	148.57	148.20	90.02	-9,935.66	-10.67	879.84	583.37	296.47	2.968	Alert	
19,200.00	9,455.00	19,145.59	9,455.00	149.27	148.79	90.02	-9,985.66	-10.35	879.84	582.07	297.77	2.955	Alert	
19,250.00	9,455.00	19,204.41	9,455.00	149.98	149.62	90.02	-10,035.66	-10.03	879.84	580.52	299.32	2.940	Alert	
19,300.00	9,455.00	19,245.59	9,455.00	150.69	150.21	90.02	-10,085.66	-9.71	879.84	579.23	300.61	2.927	Alert	
19,350.00	9,455.00	19,304.41	9,455.00	151.40	151.05	90.02	-10,135.66	-9.39	879.84	577.68	302.16	2.912	Alert	
19,400.00	9,455.00	19,345.59	9,455.00	152.11	151.63	90.02	-10,185.66	-9.07	879.84	576.38	303.46	2.899	Alert	
19,450.00	9,455.00	19,404.41	9,455.00	152.82	152.47	90.02	-10,235.65	-8.75	879.84	574.83	305.00	2.885	Alert	
19,500.00	9,455.00	19,445.59	9,455.00	153.53	153.06	90.02	-10,285.65	-8.43	879.84	573.54	306.30	2.872	Alert	
19,550.00	9,455.00	19,504.41	9,455.00	154.24	153.89	90.02	-10,335.65	-8.11	879.84	571.99	307.85	2.858	Alert	
19,600.00	9,455.00	19,545.59	9,455.00	154.95	154.48	90.02	-10,385.65	-7.79	879.84	570.69	309.15	2.846	Alert	
19,650.00	9,455.00	19,604.41	9,455.00	155.66	155.32	90.02	-10,435.65	-7.47	879.84	569.14	310.70	2.832	Alert	
19,700.00	9,455.00	19,645.59	9,455.00	156.37	155.90	90.02	-10,485.65	-7.15	879.83	567.84	311.99	2.820	Alert	
19,750.00	9,455.00	19,704.41	9,455.00	157.08	156.74	90.02	-10,535.65	-6.83	879.83	566.29	313.54	2.806	Alert	
19,800.00	9,455.00	19,745.59	9,455.00	157.79	157.33	90.02	-10,585.65	-6.50	879.83	564.99	314.84	2.795	Alert	
19,850.00	9,455.00	19,804.41	9,455.00	158.50	158.17	90.02	-10,635.65	-6.18	879.83	563.44	316.39	2.781	Alert	
19,900.00	9,455.00	19,845.59	9,455.00	159.21	158.75	90.02	-10,685.65	-5.86	879.83	562.14	317.69	2.769	Alert	
19,950.00	9,455.00	19,904.41	9,455.00	159.92	159.58	90.02	-10,735.64	-5.54	879.83	560.60	319.23	2.756	Alert	
20,000.00	9,455.00	19,945.59	9,455.00	160.64	160.08	90.02	-10,785.64	-5.22	879.83	559.39	320.44	2.746	Alert	
20,050.00	9,455.00	19,995.59	9,455.00	161.35	160.88	90.02	-10,835.64	-4.90	879.83	558.07	321.76	2.734	Alert	
20,055.16	9,455.00	20,000.75	9,455.00	161.42	160.74	90.02	-10,840.81	-4.87	879.83	557.94	321.89	2.733	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 Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Stray Cat 8-5 Fed Com 213H - Original Hole - Original Hole												Offset Site Error:	0.00 ft
Survey Program: 203-MWD+HDGM												Offset Well Error:	0.00 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)	Minimum Separation (ft)	Separation Factor	
0.00	0.00	4.07	4.07	0.50	0.01	-69.63	291.32	-784.65	836.99				
50.00	50.00	54.94	54.94	0.50	0.08	-69.63	291.31	-784.62	836.96	836.37	0.59	1,430.500	
100.00	100.00	105.82	105.82	0.52	0.16	-69.63	291.29	-784.54	836.87	836.20	0.68	1,234.780	
150.00	150.00	156.69	156.69	0.59	0.24	-69.63	291.26	-784.41	836.74	835.91	0.83	1,011.596	
200.00	200.00	207.57	207.57	0.70	0.31	-69.63	291.21	-784.22	836.55	835.54	1.02	823.440	
250.00	250.00	256.88	256.88	0.84	0.50	-69.63	291.08	-784.07	836.36	835.03	1.34	626.413	
300.00	300.00	306.32	306.32	0.99	0.67	-69.65	290.85	-783.99	836.21	834.55	1.66	503.867	
350.00	350.00	356.61	356.61	1.15	0.85	-69.67	290.51	-783.97	836.07	834.08	2.00	418.870	
400.00	400.00	407.90	407.89	1.31	1.03	-69.68	290.22	-783.87	835.88	833.54	2.34	356.906	
450.00	450.00	457.47	457.46	1.48	1.21	-69.69	290.01	-783.70	835.64	832.96	2.69	311.063	
500.00	500.00	506.32	506.31	1.65	1.39	-69.70	289.87	-783.57	835.47	832.44	3.03	275.627	
550.00	550.00	556.71	556.71	1.82	1.57	-69.70	289.77	-783.46	835.33	831.95	3.38	248.902	
600.00	600.00	607.49	607.48	1.99	1.75	-69.71	289.58	-783.32	835.15	831.41	3.74	223.419	
650.00	650.00	656.14	656.14	2.16	1.92	-69.73	289.33	-783.25	834.98	830.89	4.08	204.411	
700.00	700.00	704.92	704.92	2.34	2.09	-69.75	288.99	-783.28	834.89	830.46	4.43	188.348	
750.00	750.00	754.46	754.45	2.51	2.27	-69.78	288.61	-783.37	834.85	830.06	4.78	174.550	
798.17	798.17	802.18	802.17	2.68	2.44	-69.80	288.24	-783.50	834.83	829.71	5.12	163.032 CC	
800.00	800.00	803.99	803.98	2.69	2.44	-69.80	288.23	-783.50	834.83	829.70	5.13	162.623	
850.00	850.00	853.53	853.52	2.87	2.62	-69.83	287.84	-783.66	834.85	829.37	5.48	152.216	
900.00	900.00	903.20	903.18	3.04	2.79	-69.86	287.44	-783.85	834.89	829.05	5.84	143.043	
950.00	950.00	953.02	953.00	3.22	2.97	-69.89	287.07	-784.04	834.95	828.76	6.19	134.896	
1,000.00	1,000.00	1,002.87	1,002.86	3.40	3.15	-69.92	286.73	-784.24	835.01	828.47	6.54	127.623	
1,050.00	1,050.00	1,052.76	1,052.74	3.58	3.32	-69.94	286.50	-784.40	835.08	828.19	6.90	121.092	
1,100.00	1,100.00	1,100.43	1,100.41	3.75	3.49	-69.95	286.36	-784.60	835.23	827.99	7.24	115.371	
1,150.00	1,150.00	1,148.14	1,148.12	3.93	3.65	-69.96	286.28	-784.91	835.51	827.93	7.58	110.182	
1,200.00	1,200.00	1,197.87	1,197.84	4.11	3.82	-69.97	286.26	-785.31	835.88	827.95	7.93	105.378	
1,250.00	1,250.00	1,247.99	1,247.97	4.29	4.00	-69.98	286.25	-785.70	836.25	827.96	8.28	100.963	
1,300.00	1,300.00	1,299.07	1,299.05	4.46	4.17	-69.99	286.30	-786.04	836.57	827.94	8.64	96.876	
1,350.00	1,350.00	1,349.87	1,349.84	4.64	4.35	-69.98	286.44	-786.28	836.84	827.85	8.99	93.113	
1,400.00	1,400.00	1,399.64	1,399.61	4.82	4.52	-69.98	286.58	-786.50	837.10	827.76	9.34	89.665	
1,450.00	1,450.00	1,450.11	1,450.09	5.00	4.69	-69.98	286.68	-786.74	837.36	827.67	9.69	86.431	
1,500.00	1,500.00	1,501.69	1,501.66	5.18	4.87	-69.98	286.72	-786.93	837.54	827.50	10.05	83.367	
1,550.00	1,550.00	1,553.12	1,553.09	5.36	5.05	-69.99	286.69	-787.05	837.64	827.23	10.41	80.501	
1,600.00	1,600.00	1,604.44	1,604.41	5.53	5.23	-69.99	286.64	-787.08	837.65	826.89	10.76	77.814	
1,650.00	1,650.00	1,654.52	1,654.49	5.71	5.40	-69.99	286.60	-787.06	837.61	826.50	11.12	75.344	
1,700.00	1,700.00	1,704.10	1,704.07	5.89	5.58	-69.99	286.58	-787.05	837.60	826.13	11.47	73.045	
1,708.99	1,708.99	1,713.01	1,712.99	5.92	5.61	-69.99	286.58	-787.05	837.60	826.07	11.53	72.647	
1,750.00	1,750.00	1,753.74	1,753.72	6.07	5.75	-69.99	286.58	-787.05	837.60	825.79	11.82	70.893	
1,800.00	1,800.00	1,803.40	1,803.37	6.25	5.91	-69.99	286.60	-787.07	837.63	825.47	12.16	68.867	
1,850.00	1,850.00	1,853.16	1,853.14	6.43	6.09	-69.99	286.62	-787.12	837.68	825.16	12.52	66.933	
1,900.00	1,900.00	1,903.03	1,903.01	6.61	6.26	-69.99	286.59	-787.19	837.73	824.87	12.87	65.102	
1,950.00	1,950.00	1,954.43	1,954.40	6.78	6.44	-70.00	286.54	-787.22	837.75	824.52	13.23	63.334	
2,000.00	2,000.00	2,005.83	2,005.80	6.96	6.62	-70.00	286.48	-787.18	837.69	824.10	13.59	61.654	
2,050.00	2,050.00	2,054.15	2,054.12	7.14	6.79	-70.00	286.45	-787.15	837.65	823.71	13.93	60.114	
2,055.19	2,055.19	2,059.21	2,059.19	7.16	6.81	-70.00	286.44	-787.15	837.65	823.68	13.97	59.958	
2,100.00	2,100.00	2,103.19	2,103.16	7.32	6.96	-70.00	286.44	-787.18	837.67	823.39	14.28	58.642	
2,150.00	2,150.00	2,152.75	2,152.72	7.50	7.14	-70.01	286.45	-787.24	837.74	823.10	14.64	57.234	
2,200.00	2,200.00	2,202.58	2,202.56	7.68	7.31	-70.01	286.46	-787.33	837.82	822.83	14.99	55.891	
2,250.00	2,250.00	2,252.90	2,252.87	7.86	7.49	-70.01	286.49	-787.40	837.90	822.56	15.34	54.605	
2,300.00	2,300.00	2,303.42	2,303.39	8.04	7.66	-70.01	286.52	-787.45	837.96	822.26	15.70	53.372	
2,350.00	2,350.00	2,354.14	2,354.11	8.22	7.84	-70.01	286.51	-787.47	837.97	821.91	16.06	52.188	
2,400.00	2,400.00	2,404.07	2,404.04	8.39	8.02	-70.01	286.46	-787.47	837.96	821.55	16.41	51.060	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Stray Cat 8-5 Fed Com 213H - Original Hole - Original Hole													Offset Site Error:	0.00 ft
Survey Program: 203-MWD+HDGM													Offset Well Error:	0.00 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		
2,403.77	2,403.77	2,407.80	2,407.77	8.41	8.03	-70.01	286.45	-787.47	837.96	821.52	16.44	50.877		
2,450.00	2,450.00	2,453.49	2,453.46	8.57	8.19	-70.01	286.44	-787.50	837.97	821.21	16.76	49.986		
2,500.00	2,500.00	2,503.68	2,503.65	8.75	8.37	-70.01	286.44	-787.53	838.00	820.89	17.12	48.950		
2,550.00	2,550.00	2,554.22	2,554.20	8.93	8.55	-70.01	286.42	-787.54	838.01	820.53	17.48	47.952		
2,600.00	2,600.00	2,604.46	2,604.43	9.11	8.72	-70.02	286.38	-787.53	837.99	820.16	17.83	46.993		
2,650.00	2,650.00	2,654.62	2,654.60	9.29	8.90	-70.02	286.29	-787.54	837.96	819.77	18.19	46.072		
2,700.00	2,700.00	2,704.12	2,704.09	9.47	9.07	-70.03	286.20	-787.55	837.94	819.40	18.54	45.195		
2,700.58	2,700.58	2,704.69	2,704.66	9.47	9.07	-163.58	286.20	-787.55	837.94	819.39	18.54	45.185		
2,750.00	2,750.00	2,753.64	2,753.61	9.64	9.25	-163.58	286.18	-787.56	838.16	819.27	18.89	44.374 ES		
2,800.00	2,799.99	2,804.59	2,804.57	9.82	9.42	-163.60	286.14	-787.57	838.78	819.54	19.24	43.593		
2,850.00	2,849.98	2,855.55	2,855.52	9.99	9.60	-163.63	285.99	-787.56	839.76	820.17	19.59	42.868		
2,900.00	2,899.96	2,904.53	2,904.50	10.16	9.77	-163.66	285.88	-787.55	841.18	821.25	19.93	42.208		
2,950.00	2,949.92	2,954.17	2,954.14	10.33	9.95	-163.69	285.85	-787.54	843.05	822.78	20.27	41.587		
3,000.00	2,999.86	3,005.02	3,004.99	10.50	10.12	-163.74	285.76	-787.53	845.31	824.69	20.62	40.997		
3,050.00	3,049.78	3,055.83	3,055.80	10.67	10.30	-163.79	285.57	-787.50	847.94	826.97	20.97	40.442		
3,100.00	3,099.68	3,106.58	3,106.55	10.84	10.48	-163.86	285.30	-787.44	850.94	829.62	21.32	39.919		
3,150.00	3,149.54	3,155.83	3,155.80	11.02	10.65	-163.95	284.93	-787.39	854.33	832.66	21.66	39.439		
3,200.00	3,199.37	3,203.54	3,203.50	11.19	10.82	-164.06	284.18	-787.59	858.24	836.23	22.00	39.006		
3,250.00	3,249.16	3,252.88	3,252.83	11.36	11.00	-164.22	282.92	-788.06	862.67	840.32	22.35	38.599		
3,300.00	3,298.90	3,303.67	3,303.58	11.54	11.18	-164.43	281.09	-788.68	867.48	844.78	22.70	38.212		
3,350.00	3,348.61	3,354.08	3,353.94	11.72	11.36	-164.67	278.84	-789.39	872.67	849.62	23.05	37.854		
3,400.00	3,398.26	3,404.31	3,404.10	11.89	11.54	-164.91	276.54	-790.07	878.25	854.85	23.40	37.525		
3,450.00	3,447.86	3,454.43	3,454.17	12.07	11.72	-165.16	274.27	-790.70	884.24	860.48	23.76	37.222		
3,500.00	3,497.40	3,504.51	3,504.20	12.25	11.89	-165.39	272.16	-791.24	890.62	866.51	24.11	36.945		
3,550.00	3,546.89	3,552.05	3,551.70	12.43	12.06	-165.61	270.32	-791.73	897.46	873.01	24.45	36.708		
3,600.00	3,596.30	3,599.26	3,598.88	12.61	12.23	-165.82	268.65	-792.28	904.86	880.07	24.79	36.502		
3,650.00	3,645.68	3,648.34	3,647.93	12.79	12.41	-166.05	267.03	-792.88	912.57	887.43	25.14	36.304		
3,700.00	3,695.06	3,697.64	3,697.20	12.97	12.58	-166.27	265.45	-793.48	920.30	894.81	25.49	36.110		
3,750.00	3,744.44	3,750.92	3,750.44	13.16	12.77	-166.52	263.51	-794.06	927.93	902.08	25.85	35.896		
3,800.00	3,793.82	3,806.70	3,806.16	13.34	12.97	-166.81	260.93	-794.57	935.36	909.14	26.22	35.668		
3,850.00	3,843.20	3,872.99	3,872.31	13.53	13.21	-167.20	256.67	-794.60	942.14	915.50	26.63	35.375		
3,900.00	3,892.58	3,937.90	3,936.98	13.71	13.45	-167.65	251.10	-793.86	948.08	921.05	27.03	35.073		
3,950.00	3,941.96	4,002.37	4,001.07	13.90	13.68	-168.15	244.31	-792.41	953.27	925.84	27.43	34.759		
4,000.00	3,991.34	4,047.62	4,046.03	14.09	13.84	-168.51	239.35	-791.32	958.37	930.60	27.77	34.512		
4,050.00	4,040.72	4,096.74	4,094.83	14.27	14.02	-168.90	233.86	-790.11	963.46	935.34	28.12	34.259		
4,100.00	4,090.10	4,145.04	4,142.83	14.46	14.19	-169.27	228.64	-788.92	968.64	940.16	28.47	34.018		
4,150.00	4,139.48	4,195.05	4,192.55	14.65	14.37	-169.63	223.46	-787.66	973.89	945.05	28.83	33.778		
4,200.00	4,188.86	4,247.38	4,244.59	14.84	14.56	-170.01	218.08	-786.20	979.06	949.86	29.20	33.535		
4,250.00	4,238.24	4,297.07	4,294.00	15.03	14.74	-170.36	212.97	-784.70	984.16	954.61	29.55	33.302		
4,300.00	4,287.61	4,345.14	4,341.79	15.22	14.92	-170.69	208.00	-783.31	989.35	959.44	29.91	33.082		
4,350.00	4,336.99	4,394.64	4,391.00	15.41	15.10	-171.04	202.89	-781.92	994.61	964.35	30.26	32.865		
4,400.00	4,386.37	4,444.96	4,441.04	15.61	15.28	-171.37	197.83	-780.44	999.87	969.25	30.62	32.650		
4,450.00	4,435.75	4,492.84	4,488.67	15.80	15.46	-171.68	193.16	-778.99	1,005.16	974.19	30.98	32.449		
4,500.00	4,485.13	4,540.04	4,535.65	15.99	15.63	-171.97	188.75	-777.63	1,010.59	979.26	31.33	32.258		
4,550.00	4,534.51	4,583.79	4,579.20	16.19	15.79	-172.24	184.73	-776.51	1,016.22	984.55	31.67	32.089		
4,600.00	4,583.89	4,626.40	4,621.61	16.38	15.95	-172.51	180.66	-775.73	1,022.20	990.19	32.00	31.939		
4,650.00	4,633.27	4,672.03	4,667.00	16.57	16.11	-172.81	176.09	-775.21	1,028.49	996.14	32.35	31.791		
4,700.00	4,682.65	4,720.24	4,714.94	16.77	16.29	-173.14	170.97	-774.79	1,034.89	1,002.19	32.71	31.641		
4,750.00	4,732.03	4,769.74	4,764.13	16.96	16.48	-173.48	165.44	-774.44	1,041.36	1,008.30	33.07	31.491		
4,800.00	4,781.41	4,820.30	4,814.38	17.16	16.66	-173.83	159.86	-774.01	1,047.82	1,014.38	33.43	31.339		
4,850.00	4,830.79	4,869.73	4,863.52	17.35	16.85	-174.16	154.51	-773.53	1,054.26	1,020.47	33.80	31.194		
4,900.00	4,880.17	4,918.68	4,912.20	17.55	17.03	-174.47	149.41	-773.03	1,060.75	1,026.59	34.16	31.055		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Stray Cat 8-5 Fed Com 213H - Original Hole - Original Hole													Offset Site Error:	0.00 ft
Survey Program: 203-MWD+HDGM													Offset Well Error:	0.00 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		
4,950.00	4,929.55	4,970.72	4,983.97	17.75	17.22	-174.80	144.12	-772.44	1,067.23	1,032.70	34.53	30.908		
5,000.00	4,978.93	5,023.83	5,016.78	17.94	17.42	-175.12	138.63	-771.66	1,073.57	1,038.66	34.91	30.757		
5,050.00	5,028.30	5,071.71	5,064.39	18.14	17.60	-175.42	133.56	-770.91	1,079.87	1,044.61	35.26	30.623		
5,100.00	5,077.68	5,119.30	5,111.69	18.34	17.78	-175.72	128.31	-770.27	1,086.29	1,050.67	35.62	30.497		
5,150.00	5,127.06	5,168.20	5,160.27	18.54	17.96	-176.03	122.85	-769.68	1,092.78	1,056.79	35.98	30.370		
5,200.00	5,176.44	5,217.19	5,208.96	18.73	18.14	-176.34	117.43	-769.08	1,099.31	1,062.97	36.34	30.247		
5,250.00	5,225.82	5,267.47	5,258.93	18.93	18.33	-176.65	111.95	-768.44	1,105.86	1,069.14	36.71	30.122		
5,300.00	5,275.20	5,317.79	5,308.96	19.13	18.52	-176.94	106.58	-767.74	1,112.39	1,075.30	37.08	29.999		
5,350.00	5,324.58	5,363.20	5,354.11	19.33	18.69	-177.21	101.76	-767.17	1,118.02	1,081.59	37.43	29.896		
5,400.00	5,373.96	5,409.53	5,400.17	19.53	18.86	-177.47	96.84	-766.72	1,125.82	1,088.04	37.78	29.797		
5,450.00	5,423.34	5,458.83	5,449.22	19.73	19.05	-177.75	91.74	-766.29	1,132.70	1,094.55	38.15	29.692		
5,500.00	5,472.72	5,508.19	5,498.33	19.93	19.23	-178.01	86.86	-765.83	1,139.60	1,101.09	38.51	29.590		
5,550.00	5,522.10	5,556.62	5,546.51	20.13	19.41	-178.27	81.90	-765.41	1,146.55	1,107.67	38.87	29.493		
5,600.00	5,571.48	5,605.77	5,595.36	20.33	19.60	-178.54	76.54	-765.04	1,153.54	1,114.30	39.24	29.397		
5,650.00	5,620.86	5,657.15	5,646.41	20.53	19.79	-178.84	70.73	-764.62	1,160.51	1,120.89	39.62	29.294		
5,700.00	5,670.24	5,707.98	5,696.90	20.73	19.99	-179.14	64.88	-764.11	1,167.41	1,127.42	39.99	29.193		
5,750.00	5,719.61	5,757.94	5,746.53	20.93	20.17	-179.42	59.24	-763.57	1,174.31	1,133.94	40.36	29.096		
5,800.00	5,768.99	5,806.44	5,794.73	21.13	20.36	-179.68	53.91	-763.01	1,181.20	1,140.48	40.72	29.005		
5,850.00	5,818.37	5,853.32	5,841.35	21.33	20.53	-179.92	48.94	-762.53	1,188.21	1,147.13	41.08	28.924		
5,900.00	5,867.75	5,901.20	5,888.98	21.53	20.72	-179.84	44.04	-762.12	1,195.32	1,153.88	41.44	28.843		
5,950.00	5,917.13	5,950.23	5,937.76	21.73	20.90	-179.61	39.23	-761.70	1,202.48	1,160.67	41.81	28.762		
6,000.00	5,966.51	5,999.67	5,986.98	21.94	21.09	-179.40	34.58	-761.29	1,209.66	1,167.49	42.17	28.682		
6,050.00	6,015.89	6,051.83	6,038.91	22.14	21.28	-179.16	29.60	-760.77	1,216.80	1,174.24	42.55	28.594		
6,100.00	6,065.27	6,106.87	6,093.65	22.34	21.49	-178.91	24.02	-760.07	1,223.79	1,180.84	42.95	28.495		
6,150.00	6,114.65	6,163.07	6,149.51	22.54	21.70	-178.63	17.84	-759.06	1,230.52	1,187.18	43.35	28.388		
6,200.00	6,164.03	6,217.11	6,203.16	22.74	21.91	-178.34	11.43	-757.85	1,237.05	1,193.32	43.74	28.284		
6,250.00	6,213.41	6,269.90	6,255.51	22.95	22.11	-178.05	4.78	-756.49	1,243.42	1,199.30	44.12	28.181		
6,300.00	6,262.79	6,319.67	6,304.85	23.15	22.30	-177.76	-1.59	-755.15	1,249.78	1,205.26	44.50	28.086		
6,350.00	6,312.17	6,367.95	6,352.72	23.35	22.49	-177.50	-7.77	-753.83	1,256.12	1,211.25	44.87	27.997		
6,400.00	6,361.55	6,413.87	6,398.22	23.56	22.66	-177.24	-13.75	-752.68	1,262.60	1,217.38	45.22	27.918		
6,450.00	6,410.93	6,460.47	6,444.40	23.76	22.85	-176.97	-19.94	-751.63	1,269.24	1,223.65	45.59	27.842		
6,500.00	6,460.30	6,508.64	6,492.11	23.96	23.03	-176.70	-26.46	-750.60	1,275.97	1,230.01	45.96	27.765		
6,550.00	6,509.68	6,558.01	6,541.01	24.17	23.22	-176.41	-33.25	-749.58	1,282.76	1,236.43	46.33	27.687		
6,600.00	6,559.06	6,609.93	6,592.41	24.37	23.43	-176.11	-40.49	-748.43	1,289.51	1,242.79	46.72	27.602		
6,650.00	6,608.44	6,659.35	6,641.32	24.57	23.62	-175.82	-47.47	-747.25	1,296.20	1,249.11	47.09	27.523		
6,700.00	6,657.82	6,706.24	6,687.72	24.78	23.80	-175.55	-54.07	-746.18	1,302.99	1,255.53	47.46	27.454		
6,750.00	6,707.20	6,752.45	6,733.47	24.98	23.98	-175.29	-60.55	-745.22	1,309.90	1,262.08	47.82	27.391		
6,800.00	6,756.58	6,797.90	6,778.47	25.18	24.16	-175.03	-66.90	-744.40	1,316.97	1,268.79	48.18	27.334		
6,850.00	6,805.96	6,842.86	6,822.98	25.39	24.34	-174.79	-73.14	-743.71	1,324.21	1,275.68	48.54	27.283		
6,900.00	6,855.34	6,886.98	6,866.70	25.59	24.51	-174.55	-79.05	-743.19	1,331.65	1,282.77	48.89	27.240		
6,950.00	6,904.72	6,931.47	6,910.83	25.80	24.68	-174.34	-84.75	-742.85	1,339.30	1,290.06	49.24	27.201		
7,000.00	6,954.10	6,977.35	6,956.34	26.00	24.86	-174.12	-90.56	-742.62	1,347.11	1,297.51	49.60	27.162		
7,050.00	7,003.48	7,023.80	7,002.40	26.21	25.04	-173.89	-96.51	-742.50	1,355.06	1,305.10	49.96	27.125		
7,100.00	7,052.86	7,074.27	7,052.47	26.41	25.23	-173.68	-102.87	-742.39	1,363.04	1,312.70	50.34	27.078		
7,150.00	7,102.24	7,126.00	7,103.81	26.61	25.43	-173.43	-109.18	-742.22	1,370.98	1,320.25	50.73	27.027		
7,200.00	7,151.62	7,180.73	7,158.15	26.82	25.65	-173.19	-115.71	-741.87	1,378.78	1,327.65	51.13	26.967		
7,250.00	7,200.99	7,235.90	7,212.93	27.02	25.86	-172.97	-122.19	-741.30	1,386.39	1,334.86	51.53	26.902		
7,300.00	7,250.37	7,291.39	7,268.01	27.23	26.07	-172.73	-128.87	-740.46	1,393.80	1,341.86	51.94	26.834		
7,350.00	7,299.75	7,336.46	7,312.77	27.43	26.25	-172.54	-134.23	-739.72	1,401.17	1,348.87	52.30	26.793		
7,400.00	7,349.13	7,379.91	7,355.95	27.64	26.42	-172.38	-138.97	-739.21	1,408.75	1,356.11	52.64	26.762		
7,450.00	7,398.51	7,428.85	7,404.63	27.84	26.60	-172.22	-143.93	-738.80	1,416.48	1,363.46	53.01	26.720		
7,500.00	7,447.89	7,480.17	7,455.71	28.05	26.80	-172.06	-149.03	-738.32	1,424.16	1,370.76	53.40	26.672		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 08-T23S-R32E - Stray Cat 8-5 Fed Com 213H - Original Hole - Original Hole												Offset Site Error:	0.00 ft
Survey Program: 203-MWD+HDGM												Offset Well Error:	0.00 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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
7,550.00	7,497.27	7,528.32	7,503.61	28.26	26.98	171.91	-153.76	-737.85	1,431.82	1,378.06	53.76	26.632	
7,600.00	7,546.65	7,575.87	7,550.94	28.46	27.16	171.76	-158.40	-737.44	1,439.55	1,385.42	54.13	26.596	
7,650.00	7,596.03	7,625.70	7,600.54	28.67	27.35	171.61	-163.20	-737.04	1,447.32	1,392.81	54.50	26.555	
7,700.00	7,645.41	7,675.96	7,650.57	28.87	27.54	171.47	-167.95	-736.61	1,455.06	1,400.18	54.88	26.514	
7,750.00	7,694.79	7,725.26	7,699.65	29.08	27.73	171.33	-172.60	-736.17	1,462.79	1,407.54	55.25	26.475	
7,800.00	7,744.17	7,774.53	7,748.68	29.28	27.92	171.19	-177.34	-735.73	1,470.53	1,414.91	55.62	26.437	
7,850.00	7,793.55	7,822.19	7,796.10	29.49	28.10	171.05	-182.09	-735.31	1,478.31	1,422.32	55.99	26.403	
7,900.00	7,842.93	7,870.05	7,843.70	29.70	28.28	170.90	-187.07	-734.92	1,486.15	1,429.79	56.36	26.370	
7,950.00	7,892.31	7,919.78	7,893.15	29.90	28.48	170.74	-192.39	-734.51	1,494.01	1,437.28	56.73	26.333 SF	

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 17-T23S-R32E - Sharbro Fed #2 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,600.00	9,455.00	8,710.00	8,706.73	40.10	186.17	18.54	-2.629.99	560.45	1,495.62	1,303.53	192.10	7.786		
10,650.00	9,455.00	8,710.00	8,706.73	40.47	186.17	18.54	-2.629.99	560.45	1,454.16	1,263.87	190.29	7.642		
10,700.00	9,455.00	8,710.00	8,706.73	40.84	186.17	18.54	-2.629.99	560.45	1,413.25	1,224.92	188.33	7.504		
10,750.00	9,455.00	8,710.00	8,706.73	41.23	186.17	18.54	-2.629.99	560.45	1,372.93	1,186.74	186.20	7.373		
10,800.00	9,455.00	8,710.00	8,706.73	41.62	186.17	18.54	-2.629.99	560.45	1,333.28	1,149.40	183.88	7.251		
10,850.00	9,455.00	8,710.00	8,706.73	42.02	186.17	18.54	-2.629.99	560.45	1,294.34	1,112.98	181.36	7.137		
10,900.00	9,455.00	8,710.00	8,706.73	42.43	186.17	18.54	-2.629.99	560.45	1,256.19	1,077.57	178.62	7.033		
10,950.00	9,455.00	8,710.00	8,706.73	42.85	186.17	18.54	-2.629.99	560.45	1,218.89	1,043.25	175.64	6.940		
11,000.00	9,455.00	8,710.00	8,706.73	43.28	186.17	18.54	-2.629.99	560.45	1,182.53	1,010.14	172.39	6.859		
11,050.00	9,455.00	8,710.00	8,706.73	43.72	186.17	18.54	-2.629.99	560.45	1,147.20	978.33	168.87	6.794		
11,100.00	9,455.00	8,710.00	8,706.73	44.16	186.17	18.54	-2.629.99	560.45	1,112.99	947.96	165.04	6.744		
11,150.00	9,455.00	8,710.00	8,706.73	44.61	186.17	18.54	-2.629.99	560.45	1,080.02	919.13	160.89	6.713		
11,200.00	9,455.00	8,710.00	8,706.73	45.06	186.17	18.54	-2.629.99	560.45	1,048.39	891.99	156.40	6.703		
11,250.00	9,455.00	8,710.00	8,706.73	45.53	186.17	18.54	-2.629.99	560.45	1,018.24	866.67	151.57	6.718		
11,300.00	9,455.00	8,710.00	8,706.73	46.00	186.17	18.54	-2.629.99	560.45	989.70	843.29	146.40	6.760		
11,350.00	9,455.00	8,710.00	8,706.73	46.48	186.17	18.54	-2.629.99	560.45	962.91	822.00	140.91	6.834		
11,400.00	9,455.00	8,710.00	8,706.73	46.96	186.17	18.54	-2.629.99	560.45	938.02	802.90	135.11	6.943		
11,450.00	9,455.00	8,710.00	8,706.73	47.46	186.17	18.54	-2.629.99	560.45	915.18	786.10	129.08	7.090		
11,500.00	9,455.00	8,710.00	8,706.73	47.95	186.17	18.54	-2.629.99	560.45	894.56	771.67	122.89	7.279		
11,550.00	9,455.00	8,710.00	8,706.73	48.46	186.17	18.54	-2.629.99	560.45	876.32	759.62	116.69	7.509		
11,600.00	9,455.00	8,710.00	8,706.73	48.96	186.17	18.54	-2.629.99	560.45	860.59	749.93	110.66	7.777		
11,650.00	9,455.00	8,710.00	8,706.73	49.48	186.17	18.54	-2.629.99	560.45	847.53	742.49	105.04	8.069		
11,700.00	9,455.00	8,710.00	8,706.73	50.00	186.17	18.54	-2.629.99	560.45	837.25	737.12	100.14	8.361		
11,750.00	9,455.00	8,710.00	8,706.73	50.53	186.17	18.54	-2.629.99	560.45	829.87	733.57	96.30	8.618		
11,800.00	9,455.00	8,710.00	8,706.73	51.05	186.17	18.54	-2.629.99	560.45	825.45	731.58	93.87	8.793		
11,848.14	9,455.00	8,710.00	8,706.73	51.57	186.17	18.54	-2.629.99	560.45	824.04	730.93	93.11	8.850 CC		
11,850.00	9,455.00	8,710.00	8,706.73	51.59	186.17	18.54	-2.629.99	560.45	824.05	730.93	93.12	8.850 ES		
11,900.00	9,455.00	8,710.00	8,706.73	52.13	186.17	18.54	-2.629.99	560.45	825.67	731.55	94.12	8.773		
11,950.00	9,455.00	8,710.00	8,706.73	52.67	186.17	18.54	-2.629.99	560.45	830.32	733.54	96.78	8.579		
12,000.00	9,455.00	8,710.00	8,706.73	53.22	186.17	18.54	-2.629.99	560.45	837.92	737.09	100.83	8.310		
12,050.00	9,455.00	8,710.00	8,706.73	53.77	186.17	18.54	-2.629.99	560.45	848.41	742.50	105.91	8.010		
12,100.00	9,455.00	8,710.00	8,706.73	54.33	186.17	18.54	-2.629.99	560.45	861.67	749.99	111.68	7.715		
12,150.00	9,455.00	8,710.00	8,706.73	54.89	186.17	18.54	-2.629.99	560.45	877.59	759.75	117.84	7.447		
12,200.00	9,455.00	8,710.00	8,706.73	55.45	186.17	18.54	-2.629.99	560.45	896.02	771.88	124.14	7.218		
12,250.00	9,455.00	8,710.00	8,706.73	56.02	186.17	18.54	-2.629.99	560.45	916.81	786.41	130.40	7.031		
12,300.00	9,455.00	8,710.00	8,706.73	56.59	186.17	18.54	-2.629.99	560.45	939.80	803.31	136.50	6.885		
12,350.00	9,455.00	8,710.00	8,706.73	57.17	186.17	18.54	-2.629.99	560.45	964.84	822.50	142.34	6.779		
12,400.00	9,455.00	8,710.00	8,706.73	57.75	186.17	18.54	-2.629.99	560.45	991.77	843.90	147.87	6.707		
12,450.00	9,455.00	8,710.00	8,706.73	58.33	186.17	18.54	-2.629.99	560.45	1,020.44	867.38	153.06	6.667		
12,500.00	9,455.00	8,710.00	8,706.73	58.92	186.17	18.54	-2.629.99	560.45	1,050.70	892.80	157.90	6.654 SF		
12,550.00	9,455.00	8,710.00	8,706.73	59.51	186.17	18.54	-2.629.99	560.45	1,082.43	920.03	162.40	6.665		
12,600.00	9,455.00	8,710.00	8,706.73	60.10	186.17	18.54	-2.629.99	560.45	1,115.50	948.95	166.55	6.698		
12,650.00	9,455.00	8,710.00	8,706.73	60.70	186.17	18.54	-2.629.99	560.45	1,149.80	979.41	170.39	6.748		
12,700.00	9,455.00	8,710.00	8,706.73	61.29	186.17	18.54	-2.629.99	560.45	1,185.21	1,011.29	173.92	6.815		
12,750.00	9,455.00	8,710.00	8,706.73	61.89	186.17	18.54	-2.629.99	560.45	1,221.64	1,044.48	177.17	6.895		
12,800.00	9,455.00	8,710.00	8,706.73	62.50	186.17	18.54	-2.629.99	560.45	1,259.01	1,078.86	180.15	6.989		
12,850.00	9,455.00	8,710.00	8,706.73	63.10	186.17	18.54	-2.629.99	560.45	1,297.22	1,114.33	182.89	7.093		
12,900.00	9,455.00	8,710.00	8,706.73	63.71	186.17	18.54	-2.629.99	560.45	1,336.21	1,150.81	185.41	7.207		
12,950.00	9,455.00	8,710.00	8,706.73	64.32	186.17	18.54	-2.629.99	560.45	1,375.92	1,188.19	187.72	7.329		
13,000.00	9,455.00	8,710.00	8,706.73	64.94	186.17	18.54	-2.629.99	560.45	1,416.28	1,226.42	189.85	7.460		
13,050.00	9,455.00	8,710.00	8,706.73	65.55	186.17	18.54	-2.629.99	560.45	1,457.23	1,265.42	191.82	7.597		
13,100.00	9,455.00	8,710.00	8,706.73	66.17	186.17	18.54	-2.629.99	560.45	1,498.74	1,305.11	193.62	7.740		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 17-T23S-R32E - Sharbro Fed #5 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 ft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth Depth (ft)	Vertical Depth (ft)	Measured Depth 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	18.00	18.00	0.50	10.00	157.22	-1,310.22	550.19	1,421.05					
50.00	50.00	68.00	68.00	0.50	10.04	157.22	-1,310.22	550.19	1,421.05	1,410.51	10.54	134.829		
100.00	100.00	118.00	118.00	0.52	10.13	157.22	-1,310.22	550.19	1,421.05	1,410.40	10.65	133.460		
150.00	150.00	168.00	168.00	0.59	10.28	157.22	-1,310.22	550.19	1,421.05	1,410.18	10.87	130.775		
200.00	200.00	218.00	218.00	0.70	10.47	157.22	-1,310.22	550.19	1,421.05	1,409.87	11.18	127.151		
250.00	250.00	268.00	268.00	0.84	10.72	157.22	-1,310.22	550.19	1,421.05	1,409.49	11.56	122.947		
300.00	300.00	318.00	318.00	0.99	11.01	157.22	-1,310.22	550.19	1,421.05	1,409.05	12.00	118.421		
350.00	350.00	368.00	368.00	1.15	11.35	157.22	-1,310.22	550.19	1,421.05	1,408.56	12.49	113.755		
400.00	400.00	418.00	418.00	1.31	11.72	157.22	-1,310.22	550.19	1,421.05	1,408.02	13.03	109.075		
450.00	450.00	468.00	468.00	1.48	12.13	157.22	-1,310.22	550.19	1,421.05	1,407.45	13.60	104.468		
500.00	500.00	518.00	518.00	1.65	12.57	157.22	-1,310.22	550.19	1,421.05	1,406.84	14.21	99.995		
550.00	550.00	568.00	568.00	1.82	13.03	157.22	-1,310.22	550.19	1,421.05	1,406.20	14.85	95.694		
600.00	600.00	618.00	618.00	1.99	13.52	157.22	-1,310.22	550.19	1,421.05	1,405.53	15.52	91.591		
650.00	650.00	668.00	668.00	2.16	14.04	157.22	-1,310.22	550.19	1,421.05	1,404.85	16.20	87.696		
700.00	700.00	718.00	718.00	2.34	14.58	157.22	-1,310.22	550.19	1,421.05	1,404.14	16.91	84.014		
750.00	750.00	768.00	768.00	2.51	15.13	157.22	-1,310.22	550.19	1,421.05	1,403.41	17.64	80.543		
800.00	800.00	818.00	818.00	2.69	15.70	157.22	-1,310.22	550.19	1,421.05	1,402.66	18.39	77.278		
850.00	850.00	868.00	868.00	2.87	16.28	157.22	-1,310.22	550.19	1,421.05	1,401.90	19.15	74.209		
900.00	900.00	918.00	918.00	3.04	16.88	157.22	-1,310.22	550.19	1,421.05	1,401.13	19.92	71.326		
950.00	950.00	968.00	968.00	3.22	17.49	157.22	-1,310.22	550.19	1,421.05	1,400.34	20.71	68.619		
1,000.00	1,000.00	1,018.00	1,018.00	3.40	18.11	157.22	-1,310.22	550.19	1,421.05	1,399.54	21.51	66.078		
1,050.00	1,050.00	1,068.00	1,068.00	3.58	18.74	157.22	-1,310.22	550.19	1,421.05	1,398.74	22.31	63.690		
1,100.00	1,100.00	1,118.00	1,118.00	3.75	19.37	157.22	-1,310.22	550.19	1,421.05	1,397.92	23.13	61.446		
1,150.00	1,150.00	1,168.00	1,168.00	3.93	20.02	157.22	-1,310.22	550.19	1,421.05	1,397.10	23.95	59.335		
1,200.00	1,200.00	1,218.00	1,218.00	4.11	20.67	157.22	-1,310.22	550.19	1,421.05	1,396.27	24.78	57.347		
1,250.00	1,250.00	1,268.00	1,268.00	4.29	21.33	157.22	-1,310.22	550.19	1,421.05	1,395.43	25.62	55.475		
1,300.00	1,300.00	1,318.00	1,318.00	4.46	21.99	157.22	-1,310.22	550.19	1,421.05	1,394.59	26.46	53.709		
1,350.00	1,350.00	1,368.00	1,368.00	4.64	22.66	157.22	-1,310.22	550.19	1,421.05	1,393.74	27.31	52.042		
1,400.00	1,400.00	1,418.00	1,418.00	4.82	23.34	157.22	-1,310.22	550.19	1,421.05	1,392.89	28.16	50.466		
1,450.00	1,450.00	1,468.00	1,468.00	5.00	24.02	157.22	-1,310.22	550.19	1,421.05	1,392.03	29.02	48.975		
1,500.00	1,500.00	1,518.00	1,518.00	5.18	24.70	157.22	-1,310.22	550.19	1,421.05	1,391.17	29.88	47.564		
1,550.00	1,550.00	1,568.00	1,568.00	5.36	25.39	157.22	-1,310.22	550.19	1,421.05	1,390.31	30.74	46.225		
1,600.00	1,600.00	1,618.00	1,618.00	5.53	26.08	157.22	-1,310.22	550.19	1,421.05	1,389.44	31.61	44.955		
1,650.00	1,650.00	1,668.00	1,668.00	5.71	26.77	157.22	-1,310.22	550.19	1,421.05	1,388.57	32.48	43.749		
1,700.00	1,700.00	1,718.00	1,718.00	5.89	27.47	157.22	-1,310.22	550.19	1,421.05	1,387.69	33.36	42.602		
1,750.00	1,750.00	1,768.00	1,768.00	6.07	28.16	157.22	-1,310.22	550.19	1,421.05	1,386.82	34.23	41.510		
1,800.00	1,800.00	1,818.00	1,818.00	6.25	28.87	157.22	-1,310.22	550.19	1,421.05	1,385.94	35.11	40.470		
1,850.00	1,850.00	1,868.00	1,868.00	6.43	29.57	157.22	-1,310.22	550.19	1,421.05	1,385.05	36.00	39.478		
1,900.00	1,900.00	1,918.00	1,918.00	6.61	30.27	157.22	-1,310.22	550.19	1,421.05	1,384.17	36.88	38.531		
1,950.00	1,950.00	1,968.00	1,968.00	6.78	30.98	157.22	-1,310.22	550.19	1,421.05	1,383.28	37.77	37.627		
2,000.00	2,000.00	2,018.00	2,018.00	6.96	31.69	157.22	-1,310.22	550.19	1,421.05	1,382.39	38.66	36.762		
2,050.00	2,050.00	2,068.00	2,068.00	7.14	32.40	157.22	-1,310.22	550.19	1,421.05	1,381.50	39.55	35.934		
2,100.00	2,100.00	2,118.00	2,118.00	7.32	33.12	157.22	-1,310.22	550.19	1,421.05	1,380.61	40.44	35.142		
2,150.00	2,150.00	2,168.00	2,168.00	7.50	33.83	157.22	-1,310.22	550.19	1,421.05	1,379.72	41.33	34.382		
2,200.00	2,200.00	2,218.00	2,218.00	7.68	34.55	157.22	-1,310.22	550.19	1,421.05	1,378.82	42.23	33.654		
2,250.00	2,250.00	2,268.00	2,268.00	7.86	35.26	157.22	-1,310.22	550.19	1,421.05	1,377.93	43.12	32.954		
2,300.00	2,300.00	2,318.00	2,318.00	8.04	35.98	157.22	-1,310.22	550.19	1,421.05	1,377.03	44.02	32.282		
2,350.00	2,350.00	2,368.00	2,368.00	8.22	36.70	157.22	-1,310.22	550.19	1,421.05	1,376.13	44.92	31.636		
2,400.00	2,400.00	2,418.00	2,418.00	8.39	37.42	157.22	-1,310.22	550.19	1,421.05	1,375.23	45.82	31.015		
2,450.00	2,450.00	2,468.00	2,468.00	8.57	38.15	157.22	-1,310.22	550.19	1,421.05	1,374.33	46.72	30.417		
2,500.00	2,500.00	2,518.00	2,518.00	8.75	38.87	157.22	-1,310.22	550.19	1,421.05	1,373.43	47.62	29.840		
2,550.00	2,550.00	2,568.00	2,568.00	8.93	39.59	157.22	-1,310.22	550.19	1,421.05	1,372.53	48.52	29.285		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 17-T23S-R32E - Sharbro Fed #5 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)						
2,600.00	2,600.00	2,618.00	2,618.00	9.11	40.32	157.22	-1,310.22	550.19	1,421.05	1,371.62	49.43	28.749		
2,650.00	2,650.00	2,668.00	2,668.00	9.29	41.04	157.22	-1,310.22	550.19	1,421.05	1,370.72	50.33	28.233		
2,700.00	2,700.00	2,718.00	2,718.00	9.47	41.77	157.22	-1,310.22	550.19	1,421.05	1,369.81	51.24	27.734		
2,750.00	2,750.00	2,768.00	2,768.00	9.64	42.50	63.68	-1,310.22	550.19	1,420.95	1,368.81	52.14	27.252		
2,800.00	2,799.99	2,817.99	2,817.99	9.82	43.23	63.71	-1,310.22	550.19	1,420.66	1,367.62	53.04	26.783		
2,850.00	2,849.98	2,867.98	2,867.98	9.99	43.96	63.75	-1,310.22	550.19	1,420.18	1,366.24	53.94	26.328		
2,900.00	2,899.96	2,917.96	2,917.96	10.16	44.68	63.81	-1,310.22	550.19	1,419.51	1,364.66	54.84	25.884		
2,950.00	2,949.92	2,967.92	2,967.92	10.33	45.41	63.89	-1,310.22	550.19	1,418.64	1,362.90	55.74	25.450		
3,000.00	2,999.86	3,017.86	3,017.86	10.50	46.14	63.99	-1,310.22	550.19	1,417.59	1,360.94	56.64	25.027		
3,050.00	3,049.78	3,067.78	3,067.78	10.67	46.87	64.10	-1,310.22	550.19	1,416.34	1,358.80	57.54	24.613		
3,100.00	3,099.68	3,117.68	3,117.68	10.84	47.60	64.23	-1,310.22	550.19	1,414.92	1,356.47	58.45	24.209		
3,150.00	3,149.54	3,167.54	3,167.54	11.02	48.34	64.38	-1,310.22	550.19	1,413.31	1,353.96	59.35	23.813		
3,200.00	3,199.37	3,217.37	3,217.37	11.19	49.07	64.55	-1,310.22	550.19	1,411.52	1,351.26	60.25	23.426		
3,250.00	3,249.16	3,267.16	3,267.16	11.38	49.80	64.73	-1,310.22	550.19	1,409.55	1,348.39	61.16	23.048		
3,300.00	3,298.90	3,316.90	3,316.90	11.54	50.53	64.94	-1,310.22	550.19	1,407.41	1,345.35	62.06	22.678		
3,350.00	3,348.61	3,366.61	3,366.61	11.72	51.26	65.16	-1,310.22	550.19	1,405.10	1,342.14	62.97	22.315		
3,400.00	3,398.26	3,416.26	3,416.26	11.89	51.99	65.40	-1,310.22	550.19	1,402.63	1,338.76	63.87	21.960		
3,450.00	3,447.86	3,465.86	3,465.86	12.07	52.71	65.66	-1,310.22	550.19	1,400.00	1,335.22	64.78	21.613		
3,500.00	3,497.40	3,515.40	3,515.40	12.25	53.44	65.93	-1,310.22	550.19	1,397.21	1,331.53	65.68	21.272		
3,550.00	3,546.89	3,564.89	3,564.89	12.43	54.17	66.22	-1,310.22	550.19	1,394.28	1,327.69	66.59	20.938		
3,600.00	3,596.30	3,614.30	3,614.30	12.61	54.90	66.54	-1,310.22	550.19	1,391.20	1,323.71	67.50	20.612		
3,650.00	3,645.68	3,663.68	3,663.68	12.79	55.63	66.83	-1,310.22	550.19	1,388.06	1,319.66	68.40	20.292		
3,700.00	3,695.06	3,713.06	3,713.06	12.97	56.35	67.13	-1,310.22	550.19	1,384.96	1,315.64	69.31	19.981		
3,750.00	3,744.44	3,762.44	3,762.44	13.16	57.08	67.43	-1,310.22	550.19	1,381.89	1,311.67	70.22	19.679		
3,800.00	3,793.82	3,811.82	3,811.82	13.34	57.81	67.72	-1,310.22	550.19	1,378.86	1,307.73	71.13	19.384		
3,850.00	3,843.20	3,861.20	3,861.20	13.53	58.54	68.02	-1,310.22	550.19	1,375.87	1,303.83	72.05	19.097		
3,900.00	3,892.58	3,910.58	3,910.58	13.71	59.27	68.32	-1,310.22	550.19	1,372.92	1,299.96	72.96	18.818		
3,950.00	3,941.96	3,959.96	3,959.96	13.90	60.00	68.63	-1,310.22	550.19	1,370.01	1,296.14	73.87	18.545		
4,000.00	3,991.34	4,009.34	4,009.34	14.09	60.73	68.93	-1,310.22	550.19	1,367.13	1,292.35	74.79	18.280		
4,050.00	4,040.72	4,058.72	4,058.72	14.27	61.46	69.23	-1,310.22	550.19	1,364.30	1,288.60	75.70	18.021		
4,100.00	4,090.10	4,108.10	4,108.10	14.46	62.19	69.54	-1,310.22	550.19	1,361.50	1,284.88	76.62	17.769		
4,150.00	4,139.48	4,157.48	4,157.48	14.65	62.92	69.85	-1,310.22	550.19	1,358.75	1,281.21	77.54	17.523		
4,200.00	4,188.86	4,206.86	4,206.86	14.84	63.65	70.15	-1,310.22	550.19	1,356.03	1,277.58	78.46	17.284		
4,250.00	4,238.24	4,256.24	4,256.24	15.03	64.38	70.46	-1,310.22	550.19	1,353.36	1,273.98	79.38	17.050		
4,300.00	4,287.61	4,305.61	4,305.61	15.22	65.11	70.77	-1,310.22	550.19	1,350.72	1,270.42	80.30	16.821		
4,350.00	4,336.99	4,354.99	4,354.99	15.41	65.84	71.09	-1,310.22	550.19	1,348.13	1,266.91	81.22	16.599		
4,400.00	4,386.37	4,404.37	4,404.37	15.61	66.57	71.40	-1,310.22	550.19	1,345.57	1,263.43	82.14	16.381		
4,450.00	4,435.75	4,453.75	4,453.75	15.80	67.30	71.71	-1,310.22	550.19	1,343.06	1,260.00	83.06	16.169		
4,500.00	4,485.13	4,503.13	4,503.13	15.99	68.03	72.03	-1,310.22	550.19	1,340.59	1,256.60	83.99	15.962		
4,550.00	4,534.51	4,552.51	4,552.51	16.19	68.76	72.34	-1,310.22	550.19	1,338.16	1,253.25	84.91	15.760		
4,600.00	4,583.89	4,601.89	4,601.89	16.38	69.49	72.66	-1,310.22	550.19	1,335.77	1,249.93	85.84	15.562		
4,650.00	4,633.27	4,651.27	4,651.27	16.57	70.22	72.98	-1,310.22	550.19	1,333.42	1,246.66	86.77	15.369		
4,700.00	4,682.65	4,700.65	4,700.65	16.77	70.95	73.30	-1,310.22	550.19	1,331.12	1,243.42	87.70	15.180		
4,750.00	4,732.03	4,750.03	4,750.03	16.96	71.68	73.62	-1,310.22	550.19	1,328.86	1,240.21	88.63	14.995		
4,800.00	4,781.41	4,799.41	4,799.41	17.16	81.33	73.94	-1,310.22	550.19	1,326.64	1,237.04	89.56	14.814		
4,850.00	4,830.79	4,848.79	4,848.79	17.35	79.86	74.26	-1,310.22	550.19	1,324.46	1,233.91	90.49	14.637		
4,900.00	4,880.17	4,898.17	4,898.17	17.55	78.39	74.59	-1,310.22	550.19	1,322.33	1,230.82	91.42	14.464		
4,950.00	4,929.55	4,947.55	4,947.55	17.75	76.93	74.91	-1,310.22	550.19	1,320.24	1,227.77	92.35	14.295		
5,000.00	4,978.93	4,996.93	4,996.93	17.94	75.46	75.24	-1,310.22	550.19	1,318.19	1,224.73	93.28	14.130		
5,050.00	5,028.30	5,046.30	5,046.30	18.14	74.00	75.57	-1,310.22	550.19	1,316.19	1,221.72	94.20	13.969		
5,100.00	5,077.68	5,095.68	5,095.68	18.34	72.54	75.89	-1,310.22	550.19	1,314.23	1,218.74	95.13	13.812		
5,150.00	5,127.06	5,145.06	5,145.06	18.54	71.07	76.22	-1,310.22	550.19	1,312.32	1,215.80	96.06	13.659		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 17-T23S-R32E - Sharbro Fed #5 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 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		
5,200.00	5,178.44	5,195.46	5,194.44	18.73	81.21	78.55	-1,310.22	550.19	1,310.45	1,210.54	99.90	13.117		
5,250.00	5,225.82	5,244.83	5,243.82	18.93	82.68	78.88	-1,310.22	550.19	1,308.62	1,207.05	101.57	12.884		
5,300.00	5,275.20	5,294.21	5,293.20	19.13	84.15	77.21	-1,310.22	550.19	1,306.84	1,203.60	103.24	12.659		
5,350.00	5,324.58	5,343.59	5,342.58	19.33	85.62	77.55	-1,310.22	550.19	1,305.10	1,200.20	104.91	12.441		
5,400.00	5,373.96	5,392.97	5,391.96	19.53	87.08	77.88	-1,310.22	550.19	1,303.41	1,196.84	106.57	12.230		
5,450.00	5,423.34	5,442.35	5,441.34	19.73	88.55	78.21	-1,310.22	550.19	1,301.76	1,193.52	108.24	12.026		
5,500.00	5,472.72	5,491.73	5,490.72	19.93	90.03	78.55	-1,310.22	550.19	1,300.16	1,190.25	109.91	11.829		
5,550.00	5,522.10	5,541.11	5,540.10	20.13	91.50	78.88	-1,310.22	550.19	1,298.61	1,187.02	111.59	11.638		
5,600.00	5,571.48	5,590.49	5,589.48	20.33	92.97	79.22	-1,310.22	550.19	1,297.10	1,183.84	113.26	11.453		
5,650.00	5,620.86	5,639.87	5,638.86	20.53	94.44	79.56	-1,310.22	550.19	1,295.63	1,180.70	114.93	11.273		
5,700.00	5,670.24	5,689.25	5,688.24	20.73	95.91	79.89	-1,310.22	550.19	1,294.22	1,177.61	116.60	11.099		
5,750.00	5,719.61	5,738.63	5,737.61	20.93	97.38	80.23	-1,310.22	550.19	1,292.84	1,174.57	118.28	10.931		
5,800.00	5,768.99	5,788.01	5,786.99	21.13	98.85	80.57	-1,310.22	550.19	1,291.52	1,171.57	119.95	10.767		
5,850.00	5,818.37	5,837.39	5,836.37	21.33	100.33	80.91	-1,310.22	550.19	1,290.24	1,168.62	121.62	10.608		
5,900.00	5,867.75	5,886.77	5,885.75	21.53	101.80	81.25	-1,310.22	550.19	1,289.01	1,165.71	123.30	10.454		
5,950.00	5,917.13	5,936.15	5,935.13	21.73	103.27	81.59	-1,310.22	550.19	1,287.82	1,162.85	124.97	10.305		
6,000.00	5,966.51	5,985.52	5,984.51	21.94	104.74	81.94	-1,310.22	550.19	1,286.68	1,160.03	126.65	10.159		
6,050.00	6,015.89	6,034.90	6,033.89	22.14	106.22	82.28	-1,310.22	550.19	1,285.59	1,157.26	128.33	10.018		
6,100.00	6,065.27	6,084.28	6,083.27	22.34	107.69	82.62	-1,310.22	550.19	1,284.55	1,154.54	130.00	9.881		
6,150.00	6,114.65	6,133.66	6,132.65	22.54	109.16	82.96	-1,310.22	550.19	1,283.55	1,151.87	131.68	9.748		
6,200.00	6,164.03	6,183.04	6,182.03	22.74	110.64	83.31	-1,310.22	550.19	1,282.60	1,149.24	133.36	9.618		
6,250.00	6,213.41	6,232.42	6,231.41	22.95	112.11	83.65	-1,310.22	550.19	1,281.70	1,146.66	135.03	9.492		
6,300.00	6,262.79	6,281.80	6,280.79	23.15	113.58	84.00	-1,310.22	550.19	1,280.84	1,144.13	136.71	9.369		
6,350.00	6,312.17	6,331.18	6,330.17	23.35	115.06	84.34	-1,310.22	550.19	1,280.03	1,141.64	138.39	9.250		
6,400.00	6,361.55	6,380.56	6,379.55	23.56	116.53	84.69	-1,310.22	550.19	1,279.27	1,139.20	140.07	9.133		
6,450.00	6,410.93	6,429.94	6,428.93	23.76	118.01	85.03	-1,310.22	550.19	1,278.56	1,136.81	141.75	9.020		
6,500.00	6,460.30	6,479.32	6,478.30	23.96	119.48	85.38	-1,310.22	550.19	1,277.90	1,134.47	143.42	8.910		
6,550.00	6,509.68	6,528.70	6,527.68	24.17	120.95	85.73	-1,310.22	550.19	1,277.28	1,132.17	145.10	8.803		
6,600.00	6,559.06	6,578.08	6,577.06	24.37	122.43	86.07	-1,310.22	550.19	1,276.71	1,129.93	146.78	8.698		
6,650.00	6,608.44	6,627.46	6,626.44	24.57	123.90	86.42	-1,310.22	550.19	1,276.19	1,127.73	148.46	8.596		
6,700.00	6,657.82	6,676.84	6,675.82	24.78	125.38	86.77	-1,310.22	550.19	1,275.72	1,125.58	150.14	8.497		
6,750.00	6,707.20	6,726.21	6,725.20	24.98	126.85	87.12	-1,310.22	550.19	1,275.29	1,123.47	151.82	8.400		
6,800.00	6,756.58	6,775.59	6,774.58	25.18	128.33	87.47	-1,310.22	550.19	1,274.92	1,121.42	153.50	8.305		
6,850.00	6,805.96	6,824.97	6,823.96	25.39	129.80	87.81	-1,310.22	550.19	1,274.59	1,119.41	155.18	8.213		
6,900.00	6,855.34	6,874.35	6,873.34	25.59	131.28	88.16	-1,310.22	550.19	1,274.31	1,117.45	156.86	8.124		
6,950.00	6,904.72	6,923.73	6,922.72	25.80	132.75	88.51	-1,310.22	550.19	1,274.08	1,115.54	158.54	8.036		
7,000.00	6,954.10	6,973.11	6,972.10	26.00	134.23	88.86	-1,310.22	550.19	1,273.90	1,113.67	160.23	7.951		
7,050.00	7,003.48	7,022.49	7,021.48	26.21	135.71	89.21	-1,310.22	550.19	1,273.76	1,111.86	161.91	7.867		
7,100.00	7,052.86	7,071.87	7,070.86	26.41	137.18	89.56	-1,310.22	550.19	1,273.68	1,110.09	163.59	7.786		
7,150.00	7,102.24	7,121.25	7,120.24	26.61	138.66	89.91	-1,310.22	550.19	1,273.64	1,108.37	165.27	7.706		
7,163.37	7,115.44	7,134.45	7,133.44	26.67	139.05	90.00	-1,310.22	550.19	1,273.64	1,107.92	165.72	7.686		
7,200.00	7,151.82	7,170.83	7,169.82	26.82	140.13	90.26	-1,310.22	550.19	1,273.65	1,106.70	166.95	7.629		
7,250.00	7,200.99	7,220.01	7,218.99	27.02	141.61	90.60	-1,310.22	550.19	1,273.71	1,105.08	168.63	7.553		
7,300.00	7,250.37	7,269.39	7,268.37	27.23	143.08	90.95	-1,310.22	550.19	1,273.82	1,103.51	170.31	7.479		
7,350.00	7,299.75	7,318.77	7,317.75	27.43	144.56	91.30	-1,310.22	550.19	1,273.98	1,101.98	171.99	7.407		
7,400.00	7,349.13	7,368.15	7,367.13	27.64	146.04	91.65	-1,310.22	550.19	1,274.18	1,100.51	173.68	7.337		
7,450.00	7,398.51	7,417.53	7,416.51	27.84	147.51	92.00	-1,310.22	550.19	1,274.44	1,099.08	175.36	7.268		
7,500.00	7,447.89	7,466.90	7,465.89	28.05	148.99	92.35	-1,310.22	550.19	1,274.74	1,097.70	177.04	7.200		
7,550.00	7,497.27	7,516.28	7,515.27	28.26	150.47	92.70	-1,310.22	550.19	1,275.09	1,096.37	178.72	7.134		
7,600.00	7,546.65	7,565.66	7,564.65	28.46	151.94	93.04	-1,310.22	550.19	1,275.49	1,095.08	180.40	7.070		
7,650.00	7,596.03	7,615.04	7,614.03	28.67	153.42	93.39	-1,310.22	550.19	1,275.93	1,093.85	182.09	7.007		
7,700.00	7,645.41	7,664.42	7,663.41	28.87	154.90	93.74	-1,310.22	550.19	1,276.43	1,092.66	183.77	6.946		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 17-T23S-R32E - Sharbro Fed #5 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference	Offset		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
7,750.00	7,694.79	7,713.80	7,712.79	29.08	156.37	94.09	-1,310.22	550.19	1,276.97	1,091.52	185.45	6.888		
7,800.00	7,744.17	7,763.18	7,762.17	29.28	157.85	94.43	-1,310.22	550.19	1,277.56	1,090.43	187.13	6.827		
7,850.00	7,793.55	7,812.56	7,811.55	29.49	159.33	94.78	-1,310.22	550.19	1,278.20	1,089.39	188.81	6.770		
7,900.00	7,842.93	7,861.94	7,860.93	29.70	160.80	95.13	-1,310.22	550.19	1,278.89	1,088.39	190.49	6.713		
7,950.00	7,892.31	7,911.32	7,910.31	29.90	162.28	95.47	-1,310.22	550.19	1,279.62	1,087.44	192.18	6.659		
8,000.00	7,941.69	7,960.70	7,959.69	30.11	163.76	95.82	-1,310.22	550.19	1,280.40	1,086.54	193.86	6.605		
8,050.00	7,991.14	8,010.15	8,009.14	30.31	165.23	96.16	-1,310.22	550.19	1,281.18	1,085.64	195.54	6.552		
8,100.00	8,040.68	8,059.69	8,058.68	30.51	166.72	96.47	-1,310.22	550.19	1,281.93	1,084.71	197.22	6.500		
8,150.00	8,090.30	8,109.32	8,108.30	30.71	168.20	96.75	-1,310.22	550.19	1,282.64	1,083.74	198.90	6.449		
8,200.00	8,140.00	8,159.02	8,158.00	30.90	169.69	97.00	-1,310.22	550.19	1,283.30	1,082.72	200.58	6.398		
8,250.00	8,189.77	8,208.78	8,207.77	31.09	171.18	97.22	-1,310.22	550.19	1,283.89	1,081.64	202.26	6.348		
8,300.00	8,239.60	8,258.61	8,257.60	31.28	172.67	97.41	-1,310.22	550.19	1,284.42	1,080.49	203.93	6.298		
8,350.00	8,289.47	8,308.49	8,307.47	31.46	174.16	97.57	-1,310.22	550.19	1,284.88	1,079.27	205.61	6.249		
8,400.00	8,339.39	8,358.41	8,357.39	31.64	175.65	97.70	-1,310.22	550.19	1,285.26	1,077.98	207.28	6.201		
8,450.00	8,389.34	8,408.36	8,407.34	31.82	177.15	97.80	-1,310.22	550.19	1,285.56	1,076.61	208.95	6.152		
8,500.00	8,439.32	8,458.33	8,457.32	31.99	178.64	97.87	-1,310.22	550.19	1,285.77	1,075.15	210.62	6.105		
8,550.00	8,489.31	8,508.33	8,507.31	32.16	180.14	97.91	-1,310.22	550.19	1,285.89	1,073.61	212.28	6.057		
8,600.00	8,539.31	8,558.32	8,557.31	32.33	181.63	-168.53	-1,310.22	550.19	1,285.92	1,071.98	213.94	6.011		
8,650.00	8,589.31	8,608.32	8,607.31	32.49	183.13	-168.53	-1,310.22	550.19	1,285.92	1,070.32	215.60	5.964		
8,700.00	8,639.31	8,658.32	8,657.31	32.65	184.63	-168.53	-1,310.22	550.19	1,285.92	1,068.66	217.26	5.919		
8,750.00	8,689.31	8,708.32	8,707.31	32.82	186.12	-168.53	-1,310.22	550.19	1,285.92	1,067.00	218.92	5.874		
8,800.00	8,739.31	8,758.32	8,757.31	32.98	187.62	-168.53	-1,310.22	550.19	1,285.92	1,065.34	220.58	5.830		
8,850.00	8,789.31	8,808.32	8,807.31	33.15	189.11	-168.53	-1,310.22	550.19	1,285.92	1,063.68	222.25	5.786		
8,900.00	8,839.31	8,858.32	8,857.31	33.31	190.61	-168.53	-1,310.22	550.19	1,285.92	1,062.02	223.91	5.743		
8,950.00	8,889.31	8,908.32	8,907.31	33.47	192.11	11.84	-1,310.22	550.19	1,285.88	1,060.31	225.57	5.701		
9,000.00	8,939.22	8,958.23	8,957.22	33.63	193.60	11.92	-1,310.22	550.19	1,283.12	1,055.90	227.22	5.647		
9,050.00	8,988.69	9,007.70	9,006.69	33.79	195.08	12.14	-1,310.22	550.19	1,276.12	1,047.27	228.86	5.576		
9,100.00	9,037.34	9,056.36	9,055.34	33.95	196.54	12.49	-1,310.22	550.19	1,264.94	1,034.46	230.47	5.488		
9,127.58	9,063.70	9,082.71	9,081.70	34.03	197.32	12.76	-1,310.22	550.19	1,257.00	1,025.66	231.35	5.433 SF		
9,150.00	9,084.82	9,103.83	9,102.82	34.10	198.74	11.68	-1,310.22	550.19	1,305.31	1,093.40	211.90	6.160		
9,200.00	9,130.75	9,149.76	9,148.75	34.25	199.74	11.77	-1,310.22	550.19	1,301.08	1,091.46	209.62	6.207		
9,250.00	9,174.79	9,193.80	9,192.79	34.39	200.74	11.91	-1,310.22	550.19	1,294.51	1,087.45	207.06	6.252		
9,300.00	9,216.60	9,235.61	9,234.60	34.53	201.74	12.09	-1,310.22	550.19	1,285.60	1,081.38	204.23	6.295		
9,350.00	9,255.87	9,274.88	9,273.87	34.66	202.74	12.34	-1,310.22	550.19	1,274.38	1,073.25	201.13	6.336		
9,400.00	9,292.29	9,311.30	9,310.29	34.79	203.74	12.64	-1,310.22	550.19	1,260.88	1,063.09	197.79	6.375		
9,450.00	9,325.59	9,344.60	9,343.59	34.91	204.74	13.01	-1,310.22	550.19	1,245.11	1,050.90	194.22	6.411		
9,500.00	9,355.51	9,374.52	9,373.51	35.03	205.74	13.45	-1,310.22	550.19	1,227.13	1,036.70	190.43	6.444		
9,550.00	9,381.83	9,400.84	9,399.83	35.15	206.74	13.97	-1,310.22	550.19	1,206.96	1,020.52	186.44	6.474		
9,600.00	9,404.35	9,423.36	9,422.35	35.28	207.74	14.59	-1,310.22	550.19	1,184.66	1,002.38	182.27	6.499		
9,650.00	9,422.89	9,441.90	9,440.89	35.40	208.74	15.31	-1,310.22	550.19	1,160.27	982.31	177.96	6.520		
9,700.00	9,437.31	9,456.32	9,455.31	35.54	209.74	16.15	-1,310.22	550.19	1,133.86	960.33	173.52	6.534		
9,750.00	9,447.51	9,466.52	9,465.51	35.69	210.74	17.14	-1,310.22	550.19	1,105.48	936.48	169.00	6.541		
9,800.00	9,453.41	9,472.42	9,471.41	35.85	211.74	18.30	-1,310.22	550.19	1,075.21	910.79	164.43	6.539		
9,850.00	9,455.00	9,474.01	9,473.00	36.02	212.74	19.45	-1,310.22	550.19	1,043.16	883.31	159.85	6.526		
9,900.00	9,455.00	9,474.01	9,473.00	36.20	213.74	19.45	-1,310.22	550.19	1,011.36	856.33	155.03	6.524		
9,950.00	9,455.00	9,474.01	9,473.00	36.40	214.74	19.45	-1,310.22	550.19	981.08	831.26	149.82	6.548		
10,000.00	9,455.00	9,474.01	9,473.00	36.60	215.74	19.45	-1,310.22	550.19	952.46	808.23	144.23	6.604		
10,050.00	9,455.00	9,474.01	9,473.00	36.83	216.74	19.45	-1,310.22	550.19	925.66	787.39	138.28	6.694		
10,100.00	9,455.00	9,474.01	9,473.00	37.06	217.74	19.45	-1,310.22	550.19	900.85	768.85	131.99	6.825		
10,150.00	9,455.00	9,474.01	9,473.00	37.32	218.74	19.45	-1,310.22	550.19	878.17	752.72	125.45	7.000		
10,200.00	9,455.00	9,474.01	9,473.00	37.58	219.74	19.45	-1,310.22	550.19	857.82	739.06	118.76	7.223		
10,250.00	9,455.00	9,474.01	9,473.00	37.85	220.74	19.45	-1,310.22	550.19	839.95	727.85	112.10	7.493		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 17-T23S-R32E - Sharbro Fed #5 (Active) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY												Offset Well Error:	10.00 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 Footface (")	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
10,300.00	9,455.00	8,729.00	8,725.72	38.14	186.74	19.45	-1,310.22	550.19	824.74	719.06	105.68	7.804	
10,350.00	9,455.00	8,729.00	8,725.72	38.44	186.74	19.45	-1,310.22	550.19	812.32	712.51	99.80	8.139	
10,400.00	9,455.00	8,729.00	8,725.72	38.75	186.74	19.45	-1,310.22	550.19	802.82	708.00	94.82	8.466	
10,450.00	9,455.00	8,729.00	8,725.72	39.07	186.74	19.45	-1,310.22	550.19	796.36	705.22	91.14	8.737	
10,500.00	9,455.00	8,729.00	8,725.72	39.40	186.74	19.45	-1,310.22	550.19	793.01	703.90	89.10	8.900	
10,528.33	9,455.00	8,729.00	8,725.72	39.60	186.74	19.45	-1,310.22	550.19	792.50	703.72	88.78	8.927 CC, ES	
10,550.00	9,455.00	8,729.00	8,725.72	39.75	186.74	19.45	-1,310.22	550.19	792.80	703.86	88.94	8.914	
10,600.00	9,455.00	8,729.00	8,725.72	40.10	186.74	19.45	-1,310.22	550.19	795.73	705.08	90.66	8.777	
10,650.00	9,455.00	8,729.00	8,725.72	40.47	186.74	19.45	-1,310.22	550.19	801.79	707.71	94.07	8.523	
10,700.00	9,455.00	8,729.00	8,725.72	40.84	186.74	19.45	-1,310.22	550.19	810.88	712.04	98.84	8.204	
10,750.00	9,455.00	8,729.00	8,725.72	41.23	186.74	19.45	-1,310.22	550.19	822.92	718.34	104.58	7.869	
10,800.00	9,455.00	8,729.00	8,725.72	41.62	186.74	19.45	-1,310.22	550.19	837.77	726.86	110.91	7.553	
10,850.00	9,455.00	8,729.00	8,725.72	42.02	186.74	19.45	-1,310.22	550.19	855.29	737.75	117.55	7.276	
10,900.00	9,455.00	8,729.00	8,725.72	42.43	186.74	19.45	-1,310.22	550.19	875.33	751.10	124.23	7.046	
10,950.00	9,455.00	8,729.00	8,725.72	42.85	186.74	19.45	-1,310.22	550.19	897.70	766.90	130.80	6.863	
11,000.00	9,455.00	8,729.00	8,725.72	43.28	186.74	19.45	-1,310.22	550.19	922.24	785.12	137.12	6.726	
11,050.00	9,455.00	8,729.00	8,725.72	43.72	186.74	19.45	-1,310.22	550.19	948.79	805.65	143.14	6.629	
11,100.00	9,455.00	8,729.00	8,725.72	44.16	186.74	19.45	-1,310.22	550.19	977.17	828.38	148.79	6.568	
11,150.00	9,455.00	8,729.00	8,725.72	44.61	186.74	19.45	-1,310.22	550.19	1,007.24	853.17	154.06	6.538	
11,200.00	9,455.00	8,729.00	8,725.72	45.06	186.74	19.45	-1,310.22	550.19	1,038.84	879.89	158.95	6.536	
11,250.00	9,455.00	8,729.00	8,725.72	45.53	186.74	19.45	-1,310.22	550.19	1,071.85	908.38	163.47	6.557	
11,300.00	9,455.00	8,729.00	8,725.72	46.00	186.74	19.45	-1,310.22	550.19	1,106.13	938.51	167.62	6.599	
11,350.00	9,455.00	8,729.00	8,725.72	46.48	186.74	19.45	-1,310.22	550.19	1,141.58	970.13	171.44	6.659	
11,400.00	9,455.00	8,729.00	8,725.72	46.96	186.74	19.45	-1,310.22	550.19	1,178.08	1,003.13	174.94	6.734	
11,450.00	9,455.00	8,729.00	8,725.72	47.46	186.74	19.45	-1,310.22	550.19	1,215.54	1,037.38	178.15	6.823	
11,500.00	9,455.00	8,729.00	8,725.72	47.95	186.74	19.45	-1,310.22	550.19	1,253.87	1,072.78	181.09	6.924	
11,550.00	9,455.00	8,729.00	8,725.72	48.46	186.74	19.45	-1,310.22	550.19	1,293.01	1,109.22	183.79	7.035	
11,600.00	9,455.00	8,729.00	8,725.72	48.98	186.74	19.45	-1,310.22	550.19	1,332.87	1,146.61	186.26	7.156	
11,650.00	9,455.00	8,729.00	8,725.72	49.48	186.74	19.45	-1,310.22	550.19	1,373.39	1,184.86	188.53	7.285	
11,700.00	9,455.00	8,729.00	8,725.72	50.00	186.74	19.45	-1,310.22	550.19	1,414.52	1,223.91	190.61	7.421	
11,750.00	9,455.00	8,729.00	8,725.72	50.53	186.74	19.45	-1,310.22	550.19	1,456.20	1,263.68	192.52	7.564	
11,800.00	9,455.00	8,729.00	8,725.72	51.05	186.74	19.45	-1,310.22	550.19	1,498.40	1,304.12	194.28	7.712	

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 17-T23S-R32E - Tomcat 17 Fed #03 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 ft
Reference		Offset		Semi Major Axis			Distance				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)	
11,500.00	9,455.00	8,874.00	8,870.63	47.95	191.08	22.54	-3,615.29	566.36	1,498.96	1,290.07	208.89	7.176		
11,550.00	9,455.00	8,874.00	8,870.63	48.46	191.08	22.54	-3,615.29	566.36	1,454.66	1,246.88	207.78	7.001		
11,600.00	9,455.00	8,874.00	8,870.63	48.96	191.08	22.54	-3,615.29	566.36	1,410.74	1,204.17	206.56	6.830		
11,650.00	9,455.00	8,874.00	8,870.63	49.48	191.08	22.54	-3,615.29	566.36	1,367.24	1,162.00	205.23	6.662		
11,700.00	9,455.00	8,874.00	8,870.63	50.00	191.08	22.54	-3,615.29	566.36	1,324.19	1,120.42	203.77	6.498		
11,750.00	9,455.00	8,874.00	8,870.63	50.53	191.08	22.54	-3,615.29	566.36	1,281.66	1,079.49	202.17	6.340		
11,800.00	9,455.00	8,874.00	8,870.63	51.05	191.08	22.54	-3,615.29	566.36	1,239.68	1,039.28	200.40	6.186		
11,850.00	9,455.00	8,874.00	8,870.63	51.59	191.08	22.54	-3,615.29	566.36	1,198.31	999.87	198.44	6.039		
11,900.00	9,455.00	8,874.00	8,870.63	52.13	191.08	22.54	-3,615.29	566.36	1,157.63	961.34	196.29	5.898		
11,950.00	9,455.00	8,874.00	8,870.63	52.67	191.08	22.54	-3,615.29	566.36	1,117.70	923.79	193.91	5.764		
12,000.00	9,455.00	8,874.00	8,870.63	53.22	191.08	22.54	-3,615.29	566.36	1,078.62	887.35	191.27	5.639		
12,050.00	9,455.00	8,874.00	8,870.63	53.77	191.08	22.54	-3,615.29	566.36	1,040.46	852.12	188.34	5.524		
12,100.00	9,455.00	8,874.00	8,870.63	54.33	191.08	22.54	-3,615.29	566.36	1,003.35	818.25	185.11	5.420		
12,150.00	9,455.00	8,874.00	8,870.63	54.89	191.08	22.54	-3,615.29	566.36	967.41	785.88	181.53	5.329		
12,200.00	9,455.00	8,874.00	8,870.63	55.45	191.08	22.54	-3,615.29	566.36	932.75	755.18	177.57	5.253		
12,250.00	9,455.00	8,874.00	8,870.63	56.02	191.08	22.54	-3,615.29	566.36	899.55	726.33	173.22	5.193		
12,300.00	9,455.00	8,874.00	8,870.63	56.59	191.08	22.54	-3,615.29	566.36	867.95	699.51	168.44	5.153		
12,350.00	9,455.00	8,874.00	8,870.63	57.17	191.08	22.54	-3,615.29	566.36	838.15	674.92	163.23	5.135		
12,400.00	9,455.00	8,874.00	8,870.63	57.75	191.08	22.54	-3,615.29	566.36	810.34	652.74	157.60	5.142		
12,450.00	9,455.00	8,874.00	8,870.63	58.33	191.08	22.54	-3,615.29	566.36	784.73	633.13	151.59	5.177		
12,500.00	9,455.00	8,874.00	8,870.63	58.92	191.08	22.54	-3,615.29	566.36	761.55	616.26	145.29	5.242		
12,550.00	9,455.00	8,874.00	8,870.63	59.51	191.08	22.54	-3,615.29	566.36	741.02	602.18	138.84	5.337		
12,600.00	9,455.00	8,874.00	8,870.63	60.10	191.08	22.54	-3,615.29	566.36	723.37	590.92	132.44	5.462		
12,650.00	9,455.00	8,874.00	8,870.63	60.70	191.08	22.54	-3,615.29	566.36	708.81	582.38	128.43	5.606		
12,700.00	9,455.00	8,874.00	8,870.63	61.29	191.08	22.54	-3,615.29	566.36	697.55	576.35	121.19	5.756		
12,750.00	9,455.00	8,874.00	8,870.63	61.89	191.08	22.54	-3,615.29	566.36	689.73	572.53	117.19	5.885		
12,800.00	9,455.00	8,874.00	8,870.63	62.50	191.08	22.54	-3,615.29	566.36	685.48	570.60	114.87	5.967		
12,833.48	9,455.00	8,874.00	8,870.63	62.90	191.08	22.54	-3,615.29	566.36	684.66	570.24	114.42	5.984 CC, ES		
12,850.00	9,455.00	8,874.00	8,870.63	63.10	191.08	22.54	-3,615.29	566.36	684.86	570.33	114.53	5.980		
12,900.00	9,455.00	8,874.00	8,870.63	63.71	191.08	22.54	-3,615.29	566.36	687.89	571.67	116.22	5.919		
12,950.00	9,455.00	8,874.00	8,870.63	64.32	191.08	22.54	-3,615.29	566.36	694.51	574.79	119.71	5.801		
13,000.00	9,455.00	8,874.00	8,870.63	64.94	191.08	22.54	-3,615.29	566.36	704.62	580.01	124.61	5.655		
13,050.00	9,455.00	8,874.00	8,870.63	65.55	191.08	22.54	-3,615.29	566.36	718.09	587.64	130.44	5.505		
13,100.00	9,455.00	8,874.00	8,870.63	66.17	191.08	22.54	-3,615.29	566.36	734.71	597.93	136.78	5.371		
13,150.00	9,455.00	8,874.00	8,870.63	66.79	191.08	22.54	-3,615.29	566.36	754.29	611.01	143.29	5.264		
13,200.00	9,455.00	8,874.00	8,870.63	67.41	191.08	22.54	-3,615.29	566.36	776.60	626.80	149.70	5.188		
13,250.00	9,455.00	8,874.00	8,870.63	68.04	191.08	22.54	-3,615.29	566.36	801.42	645.55	155.87	5.142		
13,300.00	9,455.00	8,874.00	8,870.63	68.66	191.08	22.54	-3,615.29	566.36	828.50	666.83	161.67	5.125 SF		
13,350.00	9,455.00	8,874.00	8,870.63	69.29	191.08	22.54	-3,615.29	566.36	857.66	690.59	167.07	5.133		
13,400.00	9,455.00	8,874.00	8,870.63	69.92	191.08	22.54	-3,615.29	566.36	888.67	716.63	172.04	5.166		
13,450.00	9,455.00	8,874.00	8,870.63	70.56	191.08	22.54	-3,615.29	566.36	921.35	744.77	176.58	5.218		
13,500.00	9,455.00	8,874.00	8,870.63	71.19	191.08	22.54	-3,615.29	566.36	955.53	774.82	180.71	5.288		
13,550.00	9,455.00	8,874.00	8,870.63	71.83	191.08	22.54	-3,615.29	566.36	991.06	806.61	184.45	5.373		
13,600.00	9,455.00	8,874.00	8,870.63	72.46	191.08	22.54	-3,615.29	566.36	1,027.79	839.95	187.84	5.472		
13,650.00	9,455.00	8,874.00	8,870.63	73.10	191.08	22.54	-3,615.29	566.36	1,065.60	874.69	190.90	5.582		
13,700.00	9,455.00	8,874.00	8,870.63	73.75	191.08	22.54	-3,615.29	566.36	1,104.38	910.71	193.67	5.702		
13,750.00	9,455.00	8,874.00	8,870.63	74.39	191.08	22.54	-3,615.29	566.36	1,144.03	947.85	196.18	5.832		
13,800.00	9,455.00	8,874.00	8,870.63	75.03	191.08	22.54	-3,615.29	566.36	1,184.47	986.02	198.45	5.969		
13,850.00	9,455.00	8,874.00	8,870.63	75.68	191.08	22.54	-3,615.29	566.36	1,225.81	1,025.10	200.50	6.113		
13,900.00	9,455.00	8,874.00	8,870.63	76.33	191.08	22.54	-3,615.29	566.36	1,267.39	1,065.02	202.37	6.263		
13,950.00	9,455.00	8,874.00	8,870.63	76.98	191.08	22.54	-3,615.29	566.36	1,309.74	1,105.68	204.07	6.418		
14,000.00	9,455.00	8,874.00	8,870.63	77.63	191.08	22.54	-3,615.29	566.36	1,352.62	1,147.01	205.61	6.579		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 17-T23S-R32E - Tomcat 17 Fed #03 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 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		
14,050.00	9,455.00	8,874.00	8,870.63	78.28	191.08	22.54	-3,615.29	566.36	1,395.97	1,188.95	207.02	6.743		
14,100.00	9,455.00	8,874.00	8,870.63	78.93	191.08	22.54	-3,615.29	566.36	1,439.75	1,231.44	208.31	6.912		
14,150.00	9,455.00	8,874.00	8,870.63	79.59	191.08	22.54	-3,615.29	566.36	1,483.93	1,274.44	209.49	7.084		

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 20-T23S-R32E - APJ Fed #008 (Active) - Wellbore #1 - Wellbore #1											Offset Site Error:		0.00 ft
Survey Program: 10-INC-ONLY											Offset Well Error:		10.00 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
19,450.00	9,455.00	8,750.00	8,748.70	152.82	187.37	58.29	-10,551.67	-370.56	1,495.12	1,199.89	295.23	5.084	
19,500.00	9,455.00	8,750.00	8,746.70	153.53	187.37	58.29	-10,551.67	-370.56	1,485.44	1,189.43	296.01	5.018	
19,550.00	9,455.00	8,750.00	8,746.70	154.24	187.37	58.29	-10,551.67	-370.56	1,477.38	1,180.67	296.71	4.979	Alert
19,600.00	9,455.00	8,750.00	8,748.70	154.95	187.37	58.29	-10,551.67	-370.56	1,470.98	1,173.63	297.35	4.947	Alert
19,650.00	9,455.00	8,750.00	8,746.70	155.66	187.37	58.29	-10,551.67	-370.56	1,468.26	1,168.34	297.91	4.922	Alert
19,700.00	9,455.00	8,750.00	8,746.70	156.37	187.37	58.29	-10,551.67	-370.56	1,463.23	1,164.83	298.40	4.904	Alert
19,750.00	9,455.00	8,750.00	8,746.70	157.08	187.37	58.29	-10,551.67	-370.56	1,461.90	1,163.09	298.81	4.892	Alert
19,783.70	9,455.00	8,750.00	8,746.70	157.28	187.37	58.29	-10,551.67	-370.56	1,461.84	1,162.93	298.91	4.891	Alert, CC, ES
19,800.00	9,455.00	8,750.00	8,748.70	157.79	187.37	58.29	-10,551.67	-370.56	1,462.29	1,163.15	299.14	4.888	Alert, SF
19,850.00	9,455.00	8,750.00	8,746.70	158.50	187.37	58.29	-10,551.67	-370.56	1,464.39	1,165.00	299.39	4.891	Alert
19,900.00	9,455.00	8,750.00	8,746.70	159.21	187.37	58.29	-10,551.67	-370.56	1,468.18	1,168.62	299.56	4.901	Alert
19,950.00	9,455.00	8,750.00	8,746.70	159.92	187.37	58.29	-10,551.67	-370.56	1,473.66	1,174.02	299.64	4.918	Alert
20,000.00	9,455.00	8,750.00	8,746.70	160.64	187.37	58.29	-10,551.67	-370.56	1,480.82	1,181.17	299.65	4.942	Alert
20,050.00	9,455.00	8,750.00	8,746.70	161.35	187.37	58.29	-10,551.67	-370.56	1,489.81	1,190.04	299.57	4.972	Alert
20,055.16	9,455.00	8,750.00	8,746.70	161.42	187.37	58.29	-10,551.67	-370.56	1,490.81	1,191.05	299.56	4.976	Alert

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 20-T23S-R32E - Tomcat 20 Fed #01 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 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 Tooface (")	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
14,050.00	9,455.00	8,850.00	8,846.64	78.28	190.36	13.96	-6,155.67	685.33	1,480.73	1,269.68	211.04	7.016		
14,100.00	9,455.00	8,850.00	8,846.64	78.93	190.36	13.96	-6,155.67	685.33	1,436.18	1,226.12	210.05	6.837		
14,150.00	9,455.00	8,850.00	8,846.64	79.59	190.36	13.96	-6,155.67	685.33	1,391.99	1,183.03	208.96	6.661		
14,200.00	9,455.00	8,850.00	8,846.64	80.24	190.36	13.96	-6,155.67	685.33	1,348.22	1,140.46	207.76	6.489		
14,250.00	9,455.00	8,850.00	8,846.64	80.90	190.36	13.96	-6,155.67	685.33	1,304.89	1,098.46	206.43	6.321		
14,300.00	9,455.00	8,850.00	8,846.64	81.56	190.36	13.96	-6,155.67	685.33	1,262.06	1,057.09	204.97	6.157		
14,350.00	9,455.00	8,850.00	8,846.64	82.22	190.36	13.96	-6,155.67	685.33	1,219.77	1,016.43	203.34	5.999		
14,400.00	9,455.00	8,850.00	8,846.64	82.88	190.36	13.96	-6,155.67	685.33	1,178.08	976.56	201.52	5.846		
14,450.00	9,455.00	8,850.00	8,846.64	83.54	190.36	13.96	-6,155.67	685.33	1,137.07	937.56	199.51	5.699		
14,500.00	9,455.00	8,850.00	8,846.64	84.20	190.36	13.96	-6,155.67	685.33	1,096.80	899.54	197.25	5.560		
14,550.00	9,455.00	8,850.00	8,846.64	84.86	190.36	13.96	-6,155.67	685.33	1,057.36	862.62	194.74	5.430		
14,600.00	9,455.00	8,850.00	8,846.64	85.53	190.36	13.96	-6,155.67	685.33	1,018.85	826.93	191.92	5.309		
14,650.00	9,455.00	8,850.00	8,846.64	86.20	190.36	13.96	-6,155.67	685.33	981.38	792.62	188.76	5.199		
14,700.00	9,455.00	8,850.00	8,846.64	86.86	190.36	13.96	-6,155.67	685.33	945.06	759.84	185.22	5.102		
14,750.00	9,455.00	8,850.00	8,846.64	87.53	190.36	13.96	-6,155.67	685.33	910.05	728.80	181.25	5.021		
14,800.00	9,455.00	8,850.00	8,846.64	88.20	190.36	13.96	-6,155.67	685.33	876.49	699.69	178.80	4.957 Alert		
14,850.00	9,455.00	8,850.00	8,846.64	88.87	190.36	13.96	-6,155.67	685.33	844.56	672.72	171.83	4.915 Alert		
14,900.00	9,455.00	8,850.00	8,846.64	89.54	190.36	13.96	-6,155.67	685.33	814.45	648.14	166.31	4.897 Alert		
14,950.00	9,455.00	8,850.00	8,846.64	90.21	190.36	13.96	-6,155.67	685.33	786.36	626.17	160.19	4.909 Alert		
15,000.00	9,455.00	8,850.00	8,846.64	90.88	190.36	13.96	-6,155.67	685.33	760.53	607.05	153.49	4.955 Alert		
15,050.00	9,455.00	8,850.00	8,846.64	91.56	190.36	13.96	-6,155.67	685.33	737.20	590.95	146.24	5.041		
15,100.00	9,455.00	8,850.00	8,846.64	92.23	190.36	13.96	-6,155.67	685.33	716.59	578.03	138.56	5.172		
15,150.00	9,455.00	8,850.00	8,846.64	92.91	190.36	13.96	-6,155.67	685.33	698.96	568.32	130.65	5.350		
15,200.00	9,455.00	8,850.00	8,846.64	93.58	190.36	13.96	-6,155.67	685.33	684.54	561.67	122.87	5.571		
15,250.00	9,455.00	8,850.00	8,846.64	94.26	190.36	13.96	-6,155.67	685.33	673.53	557.72	115.81	5.816		
15,300.00	9,455.00	8,850.00	8,846.64	94.94	190.36	13.96	-6,155.67	685.33	666.10	555.81	110.28	6.040		
15,350.00	9,455.00	8,850.00	8,846.64	95.61	190.36	13.96	-6,155.67	685.33	662.37	555.13	107.24	6.177		
15,374.55	9,455.00	8,850.00	8,846.64	95.95	190.36	13.96	-6,155.67	685.33	661.91	555.02	106.89	6.192 CC		
15,400.00	9,455.00	8,850.00	8,846.64	96.29	190.36	13.96	-6,155.67	685.33	662.40	555.01	107.39	6.168 ES		
15,450.00	9,455.00	8,850.00	8,846.64	96.97	190.36	13.96	-6,155.67	685.33	666.20	555.47	110.72	6.017		
15,500.00	9,455.00	8,850.00	8,846.64	97.65	190.36	13.96	-6,155.67	685.33	673.69	557.15	116.54	5.781		
15,550.00	9,455.00	8,850.00	8,846.64	98.33	190.36	13.96	-6,155.67	685.33	684.77	560.89	123.87	5.528		
15,600.00	9,455.00	8,850.00	8,846.64	99.02	190.36	13.96	-6,155.67	685.33	699.25	567.35	131.90	5.301		
15,650.00	9,455.00	8,850.00	8,846.64	99.70	190.36	13.96	-6,155.67	685.33	716.94	576.89	140.05	5.119		
15,700.00	9,455.00	8,850.00	8,846.64	100.38	190.36	13.96	-6,155.67	685.33	737.59	589.65	147.94	4.966 Alert		
15,750.00	9,455.00	8,850.00	8,846.64	101.07	190.36	13.96	-6,155.67	685.33	760.98	605.60	155.38	4.898 Alert		
15,800.00	9,455.00	8,850.00	8,846.64	101.75	190.36	13.96	-6,155.67	685.33	786.85	624.60	162.25	4.850 Alert		
15,850.00	9,455.00	8,850.00	8,846.64	102.43	190.36	13.96	-6,155.67	685.33	814.97	646.46	168.51	4.836 Alert, SF		
15,900.00	9,455.00	8,850.00	8,846.64	103.12	190.36	13.96	-6,155.67	685.33	845.12	670.95	174.17	4.852 Alert		
15,950.00	9,455.00	8,850.00	8,846.64	103.81	190.36	13.96	-6,155.67	685.33	877.08	697.83	179.25	4.893 Alert		
16,000.00	9,455.00	8,850.00	8,846.64	104.49	190.36	13.96	-6,155.67	685.33	910.67	726.88	183.79	4.955 Alert		
16,050.00	9,455.00	8,850.00	8,846.64	105.18	190.36	13.96	-6,155.67	685.33	945.70	757.86	187.84	5.035		
16,100.00	9,455.00	8,850.00	8,846.64	105.87	190.36	13.96	-6,155.67	685.33	982.04	790.58	191.46	5.129		
16,150.00	9,455.00	8,850.00	8,846.64	106.56	190.36	13.96	-6,155.67	685.33	1,019.53	824.85	194.68	5.237		
16,200.00	9,455.00	8,850.00	8,846.64	107.25	190.36	13.96	-6,155.67	685.33	1,058.06	860.51	197.55	5.356		
16,250.00	9,455.00	8,850.00	8,846.64	107.93	190.36	13.96	-6,155.67	685.33	1,097.51	897.40	200.12	5.484		
16,300.00	9,455.00	8,850.00	8,846.64	108.62	190.36	13.96	-6,155.67	685.33	1,137.80	935.38	202.41	5.621		
16,350.00	9,455.00	8,850.00	8,846.64	109.32	190.36	13.96	-6,155.67	685.33	1,178.82	974.35	204.47	5.765		
16,400.00	9,455.00	8,850.00	8,846.64	110.01	190.36	13.96	-6,155.67	685.33	1,220.52	1,014.20	206.32	5.916		
16,450.00	9,455.00	8,850.00	8,846.64	110.70	190.36	13.96	-6,155.67	685.33	1,262.82	1,054.84	207.98	6.072		
16,500.00	9,455.00	8,850.00	8,846.64	111.39	190.36	13.96	-6,155.67	685.33	1,305.67	1,096.18	209.49	6.233		
16,550.00	9,455.00	8,850.00	8,846.64	112.08	190.36	13.96	-6,155.67	685.33	1,349.00	1,138.16	210.84	6.398		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 20-T23S-R32E - Tomcat 20 Fed #01 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 ft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre +N-S	+E-W	Between Centres	Between Ellipses	Minimum Separation	Separation Factor		
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)			
16,600.00	9,455.00	8,850.00	8,846.64	112.77	190.36	13.96	-6,155.67	685.33	1,392.79	1,180.71	212.07	6.567		
16,650.00	9,455.00	8,850.00	8,846.64	113.47	190.36	13.96	-6,155.67	685.33	1,436.97	1,223.78	213.19	6.740		
16,700.00	9,455.00	8,850.00	8,846.64	114.16	190.36	13.96	-6,155.67	685.33	1,481.53	1,267.32	214.21	6.916		

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 20-T23S-R32E - Tomcat 20 Fed #03 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 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		
15,650.00	9,455.00	8,600.00	8,596.79	99.70	182.88	15.76	-7,575.97	597.19	1,484.52	1,291.18	193.34	7.678		
15,700.00	9,455.00	8,600.00	8,596.79	100.38	182.88	15.76	-7,575.97	597.19	1,446.33	1,254.62	191.71	7.544		
15,750.00	9,455.00	8,600.00	8,596.79	101.07	182.88	15.76	-7,575.97	597.19	1,408.88	1,218.95	189.93	7.418		
15,800.00	9,455.00	8,600.00	8,596.79	101.75	182.88	15.76	-7,575.97	597.19	1,372.23	1,184.23	188.00	7.299		
15,850.00	9,455.00	8,600.00	8,596.79	102.43	182.88	15.76	-7,575.97	597.19	1,336.44	1,150.56	185.89	7.189		
15,900.00	9,455.00	8,600.00	8,596.79	103.12	182.88	15.76	-7,575.97	597.19	1,301.60	1,118.00	183.60	7.089		
15,950.00	9,455.00	8,600.00	8,596.79	103.81	182.88	15.76	-7,575.97	597.19	1,267.77	1,086.66	181.10	7.000		
16,000.00	9,455.00	8,600.00	8,596.79	104.49	182.88	15.76	-7,575.97	597.19	1,235.03	1,056.64	178.40	6.923		
16,050.00	9,455.00	8,600.00	8,596.79	105.18	182.88	15.76	-7,575.97	597.19	1,203.49	1,028.03	175.46	6.859		
16,100.00	9,455.00	8,600.00	8,596.79	105.87	182.88	15.76	-7,575.97	597.19	1,173.23	1,000.95	172.27	6.810		
16,150.00	9,455.00	8,600.00	8,596.79	106.56	182.88	15.76	-7,575.97	597.19	1,144.35	975.51	168.84	6.778		
16,200.00	9,455.00	8,600.00	8,596.79	107.25	182.88	15.76	-7,575.97	597.19	1,116.96	951.81	165.15	6.763		
16,250.00	9,455.00	8,600.00	8,596.79	107.93	182.88	15.76	-7,575.97	597.19	1,091.19	929.97	161.21	6.769		
16,300.00	9,455.00	8,600.00	8,596.79	108.62	182.88	15.76	-7,575.97	597.19	1,067.13	910.09	157.03	6.796		
16,350.00	9,455.00	8,600.00	8,596.79	109.32	182.88	15.76	-7,575.97	597.19	1,044.91	892.27	152.64	6.846		
16,400.00	9,455.00	8,600.00	8,596.79	110.01	182.88	15.76	-7,575.97	597.19	1,024.65	876.57	148.08	6.920		
16,450.00	9,455.00	8,600.00	8,596.79	110.70	182.88	15.76	-7,575.97	597.19	1,006.47	863.05	143.42	7.017		
16,500.00	9,455.00	8,600.00	8,596.79	111.39	182.88	15.76	-7,575.97	597.19	990.48	851.71	138.78	7.137		
16,550.00	9,455.00	8,600.00	8,596.79	112.08	182.88	15.76	-7,575.97	597.19	976.80	842.52	134.28	7.274		
16,600.00	9,455.00	8,600.00	8,596.79	112.77	182.88	15.76	-7,575.97	597.19	965.51	835.38	130.13	7.420		
16,650.00	9,455.00	8,600.00	8,596.79	113.47	182.88	15.76	-7,575.97	597.19	956.71	830.15	126.55	7.560		
16,700.00	9,455.00	8,600.00	8,596.79	114.16	182.88	15.76	-7,575.97	597.19	950.45	826.63	123.82	7.676		
16,750.00	9,455.00	8,600.00	8,596.79	114.86	182.88	15.76	-7,575.97	597.19	946.80	824.60	122.20	7.748		
16,794.25	9,455.00	8,600.00	8,596.79	115.47	182.88	15.76	-7,575.97	597.19	945.77	823.92	121.84	7.762 CC		
16,800.00	9,455.00	8,600.00	8,596.79	115.55	182.88	15.76	-7,575.97	597.19	945.79	823.91	121.88	7.760 ES		
16,850.00	9,455.00	8,600.00	8,596.79	116.25	182.88	15.76	-7,575.97	597.19	947.41	824.50	122.91	7.708		
16,900.00	9,455.00	8,600.00	8,596.79	116.94	182.88	15.76	-7,575.97	597.19	951.66	826.46	125.20	7.601		
16,950.00	9,455.00	8,600.00	8,596.79	117.64	182.88	15.76	-7,575.97	597.19	958.51	829.96	128.55	7.457		
17,000.00	9,455.00	8,600.00	8,596.79	118.33	182.88	15.76	-7,575.97	597.19	967.89	835.22	132.67	7.296		
17,050.00	9,455.00	8,600.00	8,596.79	119.03	182.88	15.76	-7,575.97	597.19	979.74	842.43	137.30	7.136		
17,100.00	9,455.00	8,600.00	8,596.79	119.73	182.88	15.76	-7,575.97	597.19	993.96	851.74	142.22	6.989		
17,150.00	9,455.00	8,600.00	8,596.79	120.42	182.88	15.76	-7,575.97	597.19	1,010.46	863.23	147.24	6.863		
17,200.00	9,455.00	8,600.00	8,596.79	121.12	182.88	15.76	-7,575.97	597.19	1,029.13	876.92	152.21	6.761		
17,250.00	9,455.00	8,600.00	8,596.79	121.82	182.88	15.76	-7,575.97	597.19	1,049.85	892.79	157.06	6.685		
17,300.00	9,455.00	8,600.00	8,596.79	122.52	182.88	15.76	-7,575.97	597.19	1,072.50	910.80	161.70	6.633		
17,350.00	9,455.00	8,600.00	8,596.79	123.22	182.88	15.76	-7,575.97	597.19	1,096.97	930.86	166.10	6.604		
17,400.00	9,455.00	8,600.00	8,596.79	123.92	182.88	15.76	-7,575.97	597.19	1,123.13	952.89	170.24	6.597 SF		
17,450.00	9,455.00	8,600.00	8,596.79	124.62	182.88	15.76	-7,575.97	597.19	1,150.86	976.76	174.10	6.610		
17,500.00	9,455.00	8,600.00	8,596.79	125.32	182.88	15.76	-7,575.97	597.19	1,180.07	1,002.38	177.69	6.641		
17,550.00	9,455.00	8,600.00	8,596.79	126.02	182.88	15.76	-7,575.97	597.19	1,210.63	1,029.63	181.01	6.688		
17,600.00	9,455.00	8,600.00	8,596.79	126.72	182.88	15.76	-7,575.97	597.19	1,242.46	1,058.39	184.07	6.750		
17,650.00	9,455.00	8,600.00	8,596.79	127.42	182.88	15.76	-7,575.97	597.19	1,275.45	1,088.57	188.88	6.825		
17,700.00	9,455.00	8,600.00	8,596.79	128.12	182.88	15.76	-7,575.97	597.19	1,309.53	1,120.05	189.47	6.911		
17,750.00	9,455.00	8,600.00	8,596.79	128.82	182.88	15.76	-7,575.97	597.19	1,344.59	1,152.74	191.85	7.008		
17,800.00	9,455.00	8,600.00	8,596.79	129.52	182.88	15.76	-7,575.97	597.19	1,380.58	1,186.55	194.04	7.115		
17,850.00	9,455.00	8,600.00	8,596.79	130.22	182.88	15.76	-7,575.97	597.19	1,417.42	1,221.38	196.04	7.230		
17,900.00	9,455.00	8,600.00	8,596.79	130.93	182.88	15.76	-7,575.97	597.19	1,455.05	1,257.17	197.88	7.353		
17,950.00	9,455.00	8,600.00	8,596.79	131.63	182.88	15.76	-7,575.97	597.19	1,493.40	1,293.83	199.57	7.483		

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 20-T23S-R32E - Tomcat 20 Fed #05 (Active) - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY													Offset Well Error:	10.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
16,950.00	9,455.00	8,655.00	8,651.76	117.84	184.53	16.46	-8,891.55	607.43	1,468.18	1,264.82	203.35	7.220		
17,000.00	9,455.00	8,655.00	8,651.76	118.33	184.53	16.46	-8,891.55	607.43	1,429.01	1,226.94	202.06	7.072		
17,050.00	9,455.00	8,655.00	8,651.76	119.03	184.53	16.46	-8,891.55	607.43	1,390.53	1,189.88	200.64	6.930		
17,100.00	9,455.00	8,655.00	8,651.76	119.73	184.53	16.46	-8,891.55	607.43	1,352.81	1,153.73	199.08	6.795		
17,150.00	9,455.00	8,655.00	8,651.76	120.42	184.53	16.46	-8,891.55	607.43	1,315.90	1,118.54	197.36	6.668		
17,200.00	9,455.00	8,655.00	8,651.76	121.12	184.53	16.46	-8,891.55	607.43	1,279.89	1,084.43	195.46	6.548		
17,250.00	9,455.00	8,655.00	8,651.76	121.82	184.53	16.46	-8,891.55	607.43	1,244.84	1,051.48	193.36	6.438		
17,300.00	9,455.00	8,655.00	8,651.76	122.52	184.53	16.46	-8,891.55	607.43	1,210.84	1,019.78	191.06	6.338		
17,350.00	9,455.00	8,655.00	8,651.76	123.22	184.53	16.46	-8,891.55	607.43	1,177.98	989.46	188.52	6.248		
17,400.00	9,455.00	8,655.00	8,651.76	123.92	184.53	16.46	-8,891.55	607.43	1,148.37	960.62	185.74	6.172		
17,450.00	9,455.00	8,655.00	8,651.76	124.62	184.53	16.46	-8,891.55	607.43	1,116.10	933.40	182.70	6.109		
17,500.00	9,455.00	8,655.00	8,651.76	125.32	184.53	16.46	-8,891.55	607.43	1,087.28	907.90	179.39	6.061		
17,550.00	9,455.00	8,655.00	8,651.76	126.02	184.53	16.46	-8,891.55	607.43	1,060.05	884.26	175.79	6.030		
17,600.00	9,455.00	8,655.00	8,651.76	126.72	184.53	16.46	-8,891.55	607.43	1,034.51	862.59	171.92	6.017		
17,650.00	9,455.00	8,655.00	8,651.76	127.42	184.53	16.46	-8,891.55	607.43	1,010.81	843.02	167.78	6.024		
17,700.00	9,455.00	8,655.00	8,651.76	128.12	184.53	16.46	-8,891.55	607.43	989.06	825.64	163.42	6.052		
17,750.00	9,455.00	8,655.00	8,651.76	128.82	184.53	16.46	-8,891.55	607.43	969.41	810.53	158.88	6.102		
17,800.00	9,455.00	8,655.00	8,651.76	129.52	184.53	16.46	-8,891.55	607.43	951.98	797.72	154.26	6.171		
17,850.00	9,455.00	8,655.00	8,651.76	130.22	184.53	16.46	-8,891.55	607.43	936.90	787.21	149.69	6.259		
17,900.00	9,455.00	8,655.00	8,651.76	130.93	184.53	16.46	-8,891.55	607.43	924.28	778.93	145.35	6.359		
17,950.00	9,455.00	8,655.00	8,651.76	131.63	184.53	16.46	-8,891.55	607.43	914.22	772.74	141.48	6.462		
18,000.00	9,455.00	8,655.00	8,651.76	132.33	184.53	16.46	-8,891.55	607.43	906.82	768.45	138.36	6.554		
18,050.00	9,455.00	8,655.00	8,651.76	133.03	184.53	16.46	-8,891.55	607.43	902.13	765.84	136.29	6.619		
18,100.00	9,455.00	8,655.00	8,651.76	133.74	184.53	16.46	-8,891.55	607.43	900.19	764.69	135.50	6.643		
18,109.87	9,455.00	8,655.00	8,651.76	133.88	184.53	16.46	-8,891.55	607.43	900.14	764.63	135.51	6.643	CC, ES	
18,150.00	9,455.00	8,655.00	8,651.76	134.44	184.53	16.46	-8,891.55	607.43	901.03	764.82	136.12	6.620		
18,200.00	9,455.00	8,655.00	8,651.76	135.14	184.53	16.46	-8,891.55	607.43	904.64	766.55	138.09	6.551		
18,250.00	9,455.00	8,655.00	8,651.76	135.85	184.53	16.46	-8,891.55	607.43	910.98	769.78	141.21	6.451		
18,300.00	9,455.00	8,655.00	8,651.76	136.55	184.53	16.46	-8,891.55	607.43	920.00	774.81	145.19	6.337		
18,350.00	9,455.00	8,655.00	8,651.76	137.26	184.53	16.46	-8,891.55	607.43	931.62	781.88	149.74	6.221		
18,400.00	9,455.00	8,655.00	8,651.76	137.98	184.53	16.46	-8,891.55	607.43	945.74	791.14	154.60	6.117		
18,450.00	9,455.00	8,655.00	8,651.76	138.67	184.53	16.46	-8,891.55	607.43	962.26	802.69	159.57	6.030		
18,500.00	9,455.00	8,655.00	8,651.76	139.37	184.53	16.46	-8,891.55	607.43	981.05	816.57	164.48	5.965		
18,550.00	9,455.00	8,655.00	8,651.76	140.08	184.53	16.46	-8,891.55	607.43	1,001.98	832.75	169.23	5.921		
18,600.00	9,455.00	8,655.00	8,651.76	140.79	184.53	16.46	-8,891.55	607.43	1,024.93	851.18	173.75	5.899		
18,650.00	9,455.00	8,655.00	8,651.76	141.49	184.53	16.46	-8,891.55	607.43	1,049.78	871.76	178.00	5.897	SF	
18,700.00	9,455.00	8,655.00	8,651.76	142.20	184.53	16.46	-8,891.55	607.43	1,076.34	894.38	181.96	5.915		
18,750.00	9,455.00	8,655.00	8,651.76	142.91	184.53	16.46	-8,891.55	607.43	1,104.54	918.93	185.62	5.951		
18,800.00	9,455.00	8,655.00	8,651.76	143.61	184.53	16.46	-8,891.55	607.43	1,134.25	945.28	188.98	6.002		
18,850.00	9,455.00	8,655.00	8,651.76	144.32	184.53	16.46	-8,891.55	607.43	1,165.35	973.30	192.06	6.068		
18,900.00	9,455.00	8,655.00	8,651.76	145.03	184.53	16.46	-8,891.55	607.43	1,197.73	1,002.87	194.87	6.146		
18,950.00	9,455.00	8,655.00	8,651.76	145.73	184.53	16.46	-8,891.55	607.43	1,231.29	1,033.87	197.42	6.237		
19,000.00	9,455.00	8,655.00	8,651.76	146.44	184.53	16.46	-8,891.55	607.43	1,265.93	1,066.18	199.75	6.338		
19,050.00	9,455.00	8,655.00	8,651.76	147.15	184.53	16.46	-8,891.55	607.43	1,301.58	1,099.71	201.86	6.448		
19,100.00	9,455.00	8,655.00	8,651.76	147.86	184.53	16.46	-8,891.55	607.43	1,338.14	1,134.36	203.78	6.567		
19,150.00	9,455.00	8,655.00	8,651.76	148.57	184.53	16.46	-8,891.55	607.43	1,375.55	1,170.03	205.52	6.693		
19,200.00	9,455.00	8,655.00	8,651.76	149.27	184.53	16.46	-8,891.55	607.43	1,413.73	1,206.63	207.10	6.826		
19,250.00	9,455.00	8,655.00	8,651.76	149.98	184.53	16.46	-8,891.55	607.43	1,452.64	1,244.10	208.54	6.966		
19,300.00	9,455.00	8,655.00	8,651.76	150.69	184.53	16.46	-8,891.55	607.43	1,492.20	1,282.36	209.85	7.111		

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 Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Offset Design Sec 20-T23S-R32E - Tomcat 20 Fed #07 (Active) - Wellbore #1 - Wellbore #1												Offset Site Error:	0.00 ft
Survey Program: 10-INC-ONLY												Offset Well Error:	10.00 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	
18,250.00	9,455.00	8,650.00	8,646.76	135.85	184.38	16.03	-10,211.31	617.69	1,494.10	1,285.33	208.77	7.157	
18,300.00	9,455.00	8,650.00	8,646.76	136.55	184.38	16.03	-10,211.31	617.69	1,454.95	1,247.25	207.69	7.005	
18,350.00	9,455.00	8,650.00	8,646.76	137.26	184.38	16.03	-10,211.31	617.69	1,416.47	1,209.98	206.50	6.859	
18,400.00	9,455.00	8,650.00	8,646.76	137.96	184.38	16.03	-10,211.31	617.69	1,378.74	1,173.57	205.17	6.720	
18,450.00	9,455.00	8,650.00	8,646.76	138.67	184.38	16.03	-10,211.31	617.69	1,341.81	1,138.11	203.70	6.587	
18,500.00	9,455.00	8,650.00	8,646.76	139.37	184.38	16.03	-10,211.31	617.69	1,305.76	1,103.69	202.07	6.462	
18,550.00	9,455.00	8,650.00	8,646.76	140.08	184.38	16.03	-10,211.31	617.69	1,270.64	1,070.39	200.25	6.345	
18,600.00	9,455.00	8,650.00	8,646.76	140.79	184.38	16.03	-10,211.31	617.69	1,236.55	1,038.31	198.24	6.238	
18,650.00	9,455.00	8,650.00	8,646.76	141.49	184.38	16.03	-10,211.31	617.69	1,203.58	1,007.57	196.01	6.140	
18,700.00	9,455.00	8,650.00	8,646.76	142.20	184.38	16.03	-10,211.31	617.69	1,171.81	978.26	193.55	6.054	
18,750.00	9,455.00	8,650.00	8,646.76	142.91	184.38	16.03	-10,211.31	617.69	1,141.34	950.51	190.84	5.981	
18,800.00	9,455.00	8,650.00	8,646.76	143.61	184.38	16.03	-10,211.31	617.69	1,112.29	924.43	187.86	5.921	
18,850.00	9,455.00	8,650.00	8,646.76	144.32	184.38	16.03	-10,211.31	617.69	1,084.77	900.16	184.61	5.876	
18,900.00	9,455.00	8,650.00	8,646.76	145.03	184.38	16.03	-10,211.31	617.69	1,058.90	877.81	181.09	5.847	
18,950.00	9,455.00	8,650.00	8,646.76	145.73	184.38	16.03	-10,211.31	617.69	1,034.79	857.50	177.29	5.837	
19,000.00	9,455.00	8,650.00	8,646.76	146.44	184.38	16.03	-10,211.31	617.69	1,012.59	839.33	173.25	5.845	
19,050.00	9,455.00	8,650.00	8,646.76	147.15	184.38	16.03	-10,211.31	617.69	992.40	823.39	169.01	5.872	
19,100.00	9,455.00	8,650.00	8,646.76	147.86	184.38	16.03	-10,211.31	617.69	974.37	809.72	164.65	5.918	
19,150.00	9,455.00	8,650.00	8,646.76	148.57	184.38	16.03	-10,211.31	617.69	958.61	798.35	160.26	5.982	
19,200.00	9,455.00	8,650.00	8,646.76	149.27	184.38	16.03	-10,211.31	617.69	945.23	789.22	156.01	6.059	
19,250.00	9,455.00	8,650.00	8,646.76	149.98	184.38	16.03	-10,211.31	617.69	934.34	782.23	152.11	6.143	
19,300.00	9,455.00	8,650.00	8,646.76	150.69	184.38	16.03	-10,211.31	617.69	926.03	777.22	148.81	6.223	
19,350.00	9,455.00	8,650.00	8,646.76	151.40	184.38	16.03	-10,211.31	617.69	920.36	773.96	146.40	6.287	
19,400.00	9,455.00	8,650.00	8,646.76	152.11	184.38	16.03	-10,211.31	617.69	917.39	772.24	145.15	6.320	
19,429.67	9,455.00	8,650.00	8,646.76	152.53	184.38	16.03	-10,211.31	617.69	916.91	771.88	145.03	6.322 CC, ES	
19,450.00	9,455.00	8,650.00	8,646.76	152.82	184.38	16.03	-10,211.31	617.69	917.13	771.91	145.22	6.315	
19,500.00	9,455.00	8,650.00	8,646.76	153.53	184.38	16.03	-10,211.31	617.69	919.60	772.96	146.64	6.271	
19,550.00	9,455.00	8,650.00	8,646.76	154.24	184.38	16.03	-10,211.31	617.69	924.77	775.52	149.25	6.196	
19,600.00	9,455.00	8,650.00	8,646.76	154.95	184.38	16.03	-10,211.31	617.69	932.59	779.78	152.81	6.103	
19,650.00	9,455.00	8,650.00	8,646.76	155.66	184.38	16.03	-10,211.31	617.69	943.01	785.99	157.02	6.006	
19,700.00	9,455.00	8,650.00	8,646.76	156.37	184.38	16.03	-10,211.31	617.69	955.93	794.32	161.60	5.915	
19,750.00	9,455.00	8,650.00	8,646.76	157.08	184.38	16.03	-10,211.31	617.69	971.25	804.90	166.35	5.838	
19,800.00	9,455.00	8,650.00	8,646.76	157.79	184.38	16.03	-10,211.31	617.69	988.87	817.78	171.09	5.780	
19,850.00	9,455.00	8,650.00	8,646.76	158.50	184.38	16.03	-10,211.31	617.69	1,008.66	832.95	175.71	5.741	
19,900.00	9,455.00	8,650.00	8,646.76	159.21	184.38	16.03	-10,211.31	617.69	1,030.50	850.39	180.11	5.722 SF	
19,950.00	9,455.00	8,650.00	8,646.76	159.92	184.38	16.03	-10,211.31	617.69	1,054.28	870.00	184.25	5.722	
20,000.00	9,455.00	8,650.00	8,646.76	160.64	184.38	16.03	-10,211.31	617.69	1,079.81	891.70	188.12	5.740	
20,050.00	9,455.00	8,650.00	8,646.76	161.35	184.38	16.03	-10,211.31	617.69	1,107.04	915.35	191.88	5.775	
20,055.16	9,455.00	8,650.00	8,646.76	161.42	184.38	16.03	-10,211.31	617.69	1,109.94	917.90	192.03	5.780	

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

Anticollision Report

Company:	WCDSC Permian NM	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Project:	Lea County (NAD83 New Mexico East)	TVD Reference:	RKB @ 3635.00ft
Reference Site:	Sec 08-T23S-R32E	MD Reference:	RKB @ 3635.00ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Alley Cat 17-20 Fed Com 526H	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 1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to RKB @ 3635.00ft

Offset Depths are relative to Offset Datum

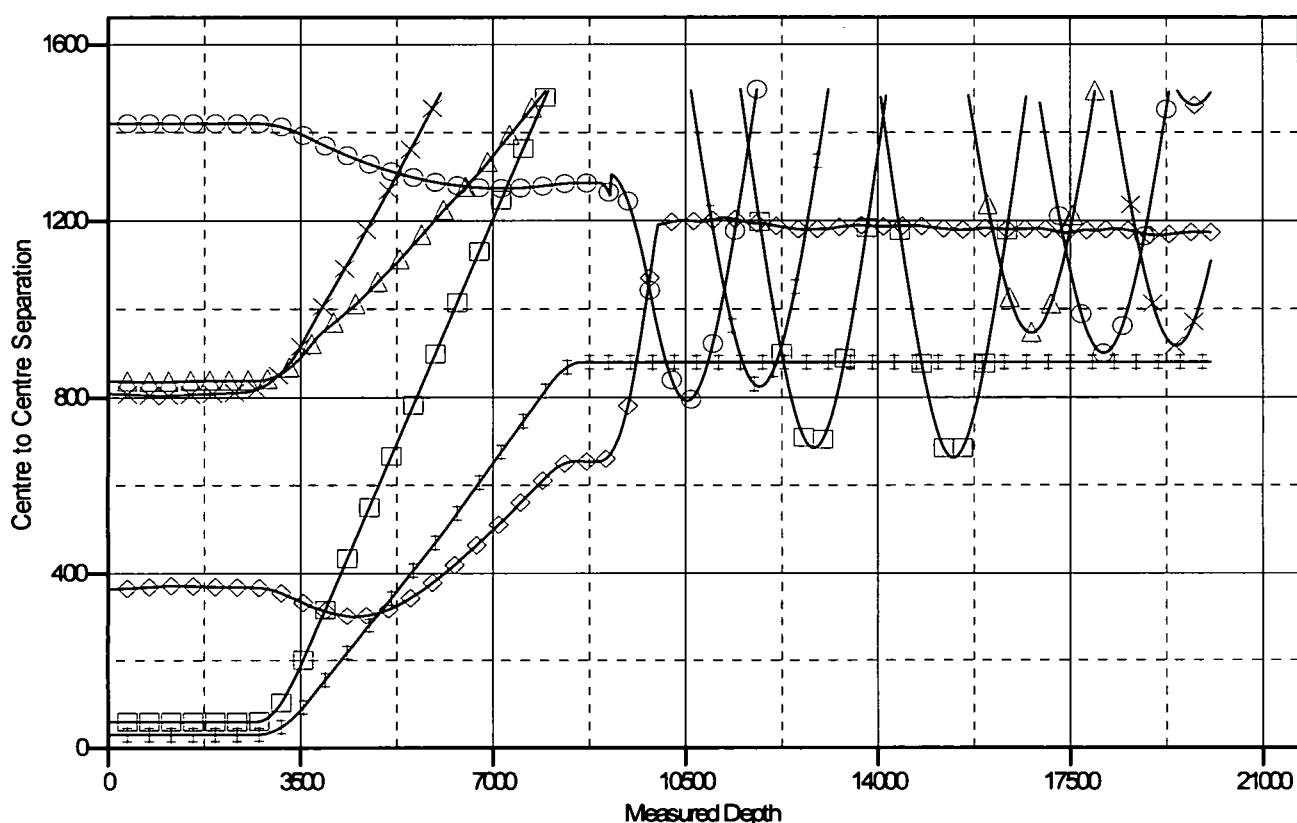
Central Meridian is -104.333334

Coordinates are relative to: Alley Cat 17-20 Fed Com 526H

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

Grid Convergence at Surface is: 0.34°

Ladder Plot

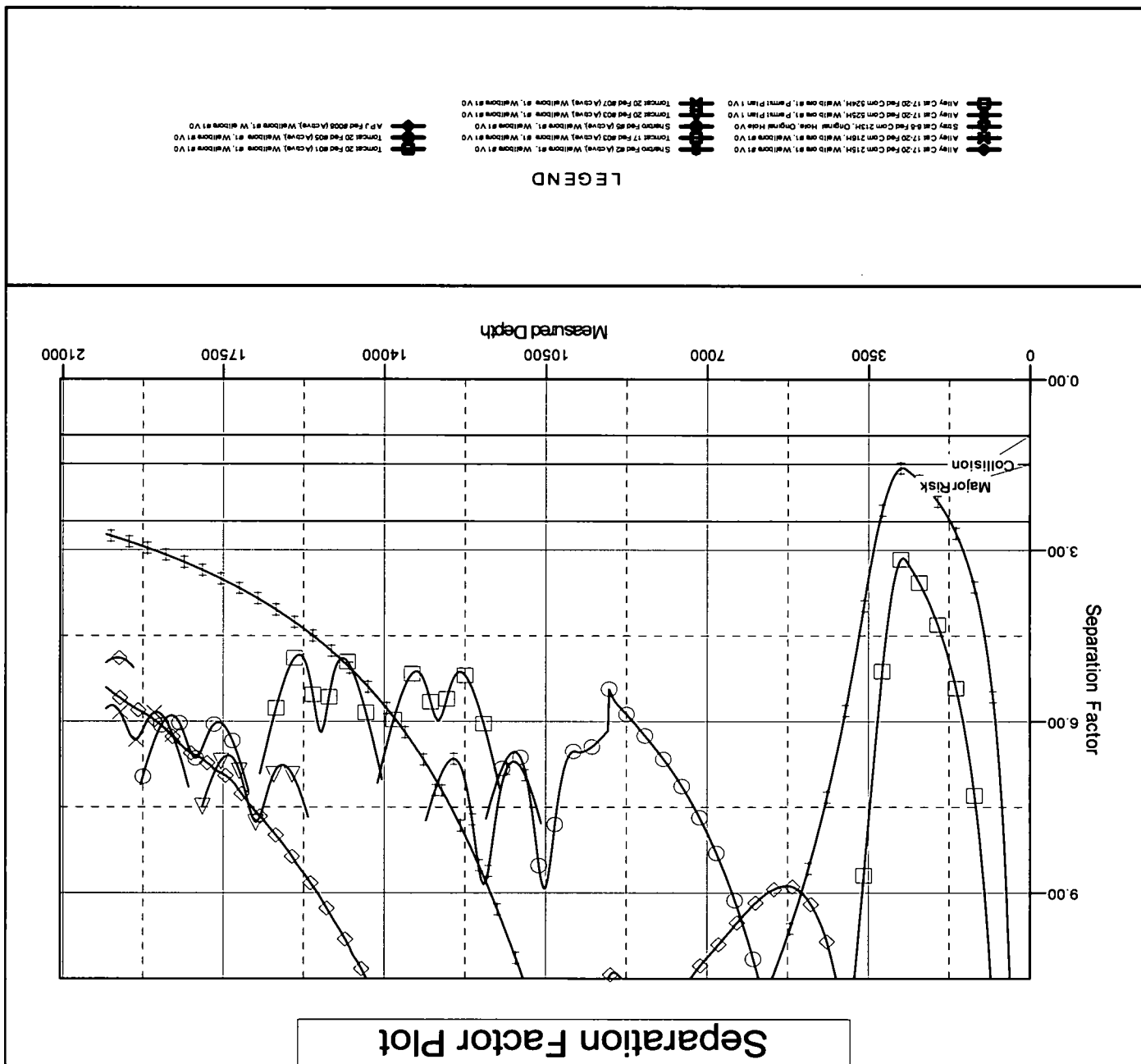


LEGEND

Alley Cat 17-20 Fed Com 215H, Wellbore #1, Wellbore #1 V0	Shafter Fed #2 (Active), Wellbore #1, Wellbore #1 V0	Tomcat 20 Fed #01 (Active), Wellbore #1, Wellbore #1 V0
Alley Cat 17-20 Fed Com 216H, Wellbore #1, Wellbore #1 V0	Tomcat 17 Fed #02 (Active), Wellbore #1, Wellbore #1 V0	Tomcat 20 Fed #05 (Active), Wellbore #1, Wellbore #1 V0
Alley Cat 17-20 Fed Com 213H, Original Hole, Original Hole V0	Shafter Fed #5 (Active), Wellbore #1, Wellbore #1 V0	A.P.J. Fed #008 (Active), Wellbore #1, Wellbore #1 V0
Alley Cat 17-20 Fed Com 526H, Wellbore #1, Permit Plan 1 V0	Tomcat 20 Fed #03 (Active), Wellbore #1, Wellbore #1 V0	
Alley Cat 17-20 Fed Com 524H, Wellbore #1, Permit Plan 1 V0	Tomcat 20 Fed #07 (Active), Wellbore #1, Wellbore #1 V0	

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

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



Separation Factor Plot

Reference Depths are relative to RKB @ 3635.00ft
 Offset Depths are relative to Offset Datum
 Coordinates are relative to: Alley Cat 17-20 Fed Com 526H
 Coordinate System is US State Plane 1983, New Mexico Eastern Zone
 Central Meridian is -104.333334
 Grid Convergence at Surface is: 0.34°

Company:	WCDCSC Permian NM	Reference Design:	Permit Plan 1
Project:	Lea County (NAD83 New Mexico East)	Reference Wellbore	Wellbore #1
Reference Site:	Sec 08-T23S-R32E	Well Error:	0.50 ft
Site Error:	0.00 ft	Reference Well:	Alley Cat 17-20 Fed Com 526H
			0.50 ft
			Survey Calculation Method:
			Output errors are at
			Database:
			Offset TVD Reference:
			Offset Datum
			EDM r5000.141_Prod US
			2.00 sigma
			Minimum Curvature
			Gnd
			RKB @ 3635.00ft
			RKB @ 3635.00ft
			Well Alley Cat 17-20 Fed Com 526H

WCDSC Permian NM

Lea County (NAD83 New Mexico East)

Sec 08-T23S-R32E

Alley Cat 17-20 Fed Com 526H

Wellbore #1

Plan: Permit Plan 1

Standard Planning Report - Geographic

04 December, 2018

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3635.00ft
Project:	Lea County (NAD83 New Mexico East)	MD Reference:	RKB @ 3635.00ft
Site:	Sec 08-T23S-R32E	North Reference:	Grid
Well:	Alley Cat 17-20 Fed Com 526H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Project	Lea County (NAD83 New Mexico East)		
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 08-T23S-R32E			
Site Position:		Northing:	483,005.73 usft	Latitude: 32.326292
From:	Lat/Long	Easting:	735,349.80 usft	Longitude: -103.705234
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence: 0.34 °

Well	Alley Cat 17-20 Fed Com 526H			
Well Position	+N/-S	0.00 ft	Northing:	478,068.63 usft
	+E/-W	0.00 ft	Easting:	739,445.58 usft
Position Uncertainty		0.50 ft	Wellhead Elevation:	Ground Level: 3,610.00 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
			(°)	(°)	(nT)
	IGRF2015	12/3/2018	6.86	60.11	47,826.16745995

Design	Permit Plan 1			
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	175.38

Plan Survey Tool Program	Date	12/4/2018		
Depth From	Depth To	Survey (Wellbore)	Tool Name	Remarks
(ft)	(ft)			
1	0.00	20,055.16 Permit Plan 1 (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	
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00	
3,603.72	9.04	93.55	3,599.98	-4.40	70.99	1.00	1.00	0.00	93.55	
7,990.21	9.04	93.55	7,932.01	-47.06	758.68	0.00	0.00	0.00	0.00	
8,592.69	0.00	0.00	8,532.00	-50.00	806.00	1.50	-1.50	0.00	180.00	
8,942.73	0.00	0.00	8,882.04	-50.00	806.00	0.00	0.00	0.00	0.00	
9,842.73	90.00	179.63	9,455.00	-622.95	809.66	10.00	10.00	0.00	179.63	PBHL - Alley Cat 17-2
20,055.16	90.00	179.63	9,455.00	-10,835.17	874.94	0.00	0.00	0.00	0.00	PBHL - Alley Cat 17-2

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3635.00ft
Project:	Lea County (NAD83 New Mexico East)	MD Reference:	RKB @ 3635.00ft
Site:	Sec 08-T23S-R32E	North Reference:	Grid
Well:	Alley Cat 17-20 Fed Com 526H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

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	478,068.63	739,445.58	32.312654	-103.692071	
100.00	0.00	0.00	100.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
200.00	0.00	0.00	200.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
300.00	0.00	0.00	300.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
400.00	0.00	0.00	400.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
500.00	0.00	0.00	500.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
600.00	0.00	0.00	600.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
700.00	0.00	0.00	700.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
800.00	0.00	0.00	800.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
900.00	0.00	0.00	900.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
1,000.00	0.00	0.00	1,000.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
1,100.00	0.00	0.00	1,100.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
1,200.00	0.00	0.00	1,200.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
1,300.00	0.00	0.00	1,300.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
1,400.00	0.00	0.00	1,400.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
1,600.00	0.00	0.00	1,600.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
1,700.00	0.00	0.00	1,700.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
1,800.00	0.00	0.00	1,800.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
1,900.00	0.00	0.00	1,900.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
2,000.00	0.00	0.00	2,000.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
2,100.00	0.00	0.00	2,100.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
2,200.00	0.00	0.00	2,200.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
2,300.00	0.00	0.00	2,300.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
2,400.00	0.00	0.00	2,400.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
2,500.00	0.00	0.00	2,500.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
2,600.00	0.00	0.00	2,600.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
2,700.00	0.00	0.00	2,700.00	0.00	0.00	478,068.63	739,445.58	32.312654	-103.692071	
2,800.00	1.00	93.55	2,799.99	-0.05	0.87	478,068.58	739,446.45	32.312654	-103.692068	
2,900.00	2.00	93.55	2,899.96	-0.22	3.48	478,068.41	739,449.06	32.312654	-103.692060	
3,000.00	3.00	93.55	2,999.86	-0.49	7.84	478,068.14	739,453.41	32.312653	-103.692045	
3,100.00	4.00	93.55	3,099.68	-0.86	13.93	478,067.77	739,459.51	32.312652	-103.692026	
3,200.00	5.00	93.55	3,199.37	-1.35	21.76	478,067.28	739,467.34	32.312650	-103.692000	
3,300.00	6.00	93.55	3,298.90	-1.94	31.33	478,066.69	739,476.90	32.312649	-103.691969	
3,400.00	7.00	93.55	3,398.26	-2.64	42.63	478,065.99	739,488.20	32.312646	-103.691933	
3,500.00	8.00	93.55	3,497.40	-3.45	55.65	478,065.18	739,501.23	32.312644	-103.691891	
3,600.00	9.00	93.55	3,596.30	-4.37	70.41	478,064.26	739,515.98	32.312641	-103.691843	
3,603.72	9.04	93.55	3,599.98	-4.40	70.99	478,064.23	739,516.56	32.312641	-103.691841	
3,700.00	9.04	93.55	3,695.06	-5.34	86.08	478,063.29	739,531.66	32.312638	-103.691792	
3,800.00	9.04	93.55	3,793.82	-6.31	101.76	478,062.32	739,547.34	32.312635	-103.691742	
3,900.00	9.04	93.55	3,892.58	-7.29	117.44	478,061.35	739,563.01	32.312632	-103.691691	
4,000.00	9.04	93.55	3,991.34	-8.26	133.11	478,060.37	739,578.69	32.312630	-103.691640	
4,100.00	9.04	93.55	4,090.10	-9.23	148.79	478,059.40	739,594.37	32.312627	-103.691589	
4,200.00	9.04	93.55	4,188.86	-10.20	164.47	478,058.43	739,610.04	32.312624	-103.691539	
4,300.00	9.04	93.55	4,287.61	-11.18	180.15	478,057.46	739,625.72	32.312621	-103.691488	
4,400.00	9.04	93.55	4,386.37	-12.15	195.82	478,056.48	739,641.40	32.312618	-103.691437	
4,500.00	9.04	93.55	4,485.13	-13.12	211.50	478,055.51	739,657.08	32.312615	-103.691387	
4,600.00	9.04	93.55	4,583.89	-14.09	227.18	478,054.54	739,672.75	32.312612	-103.691336	
4,700.00	9.04	93.55	4,682.65	-15.07	242.86	478,053.57	739,688.43	32.312609	-103.691285	
4,800.00	9.04	93.55	4,781.41	-16.04	258.53	478,052.59	739,704.11	32.312606	-103.691234	
4,900.00	9.04	93.55	4,880.17	-17.01	274.21	478,051.62	739,719.79	32.312603	-103.691184	
5,000.00	9.04	93.55	4,978.93	-17.98	289.89	478,050.65	739,735.46	32.312600	-103.691133	
5,100.00	9.04	93.55	5,077.68	-18.96	305.57	478,049.68	739,751.14	32.312597	-103.691082	
5,200.00	9.04	93.55	5,176.44	-19.93	321.24	478,048.70	739,766.82	32.312594	-103.691031	
5,300.00	9.04	93.55	5,275.20	-20.90	336.92	478,047.73	739,782.50	32.312591	-103.690981	

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3635.00ft
Project:	Lea County (NAD83 New Mexico East)	MD Reference:	RKB @ 3635.00ft
Site:	Sec 08-T23S-R32E	North Reference:	Grid
Well:	Alley Cat 17-20 Fed Com 526H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

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	9.04	93.55	5,373.96	-21.87	352.60	478,046.76	739,798.17	32.312589	-103.690930
5,500.00	9.04	93.55	5,472.72	-22.85	368.27	478,045.78	739,813.85	32.312586	-103.690879
5,600.00	9.04	93.55	5,571.48	-23.82	383.95	478,044.81	739,829.53	32.312583	-103.690829
5,700.00	9.04	93.55	5,670.24	-24.79	399.63	478,043.84	739,845.21	32.312580	-103.690778
5,800.00	9.04	93.55	5,768.99	-25.76	415.31	478,042.87	739,860.88	32.312577	-103.690727
5,900.00	9.04	93.55	5,867.75	-26.74	430.98	478,041.89	739,876.56	32.312574	-103.690676
6,000.00	9.04	93.55	5,966.51	-27.71	446.66	478,040.92	739,892.24	32.312571	-103.690626
6,100.00	9.04	93.55	6,065.27	-28.68	462.34	478,039.95	739,907.91	32.312568	-103.690575
6,200.00	9.04	93.55	6,164.03	-29.65	478.02	478,038.98	739,923.59	32.312565	-103.690524
6,300.00	9.04	93.55	6,262.79	-30.63	493.69	478,038.00	739,939.27	32.312562	-103.690473
6,400.00	9.04	93.55	6,361.55	-31.60	509.37	478,037.03	739,954.95	32.312559	-103.690423
6,500.00	9.04	93.55	6,460.30	-32.57	525.05	478,036.06	739,970.62	32.312556	-103.690372
6,600.00	9.04	93.55	6,559.06	-33.54	540.73	478,035.09	739,986.30	32.312553	-103.690321
6,700.00	9.04	93.55	6,657.82	-34.52	556.40	478,034.11	740,001.98	32.312550	-103.690271
6,800.00	9.04	93.55	6,756.58	-35.49	572.08	478,033.14	740,017.66	32.312547	-103.690220
6,900.00	9.04	93.55	6,855.34	-36.46	587.76	478,032.17	740,033.33	32.312545	-103.690169
7,000.00	9.04	93.55	6,954.10	-37.43	603.44	478,031.20	740,049.01	32.312542	-103.690118
7,100.00	9.04	93.55	7,052.86	-38.41	619.11	478,030.22	740,064.69	32.312539	-103.690068
7,200.00	9.04	93.55	7,151.62	-39.38	634.79	478,029.25	740,080.37	32.312536	-103.690017
7,300.00	9.04	93.55	7,250.37	-40.35	650.47	478,028.28	740,096.04	32.312533	-103.689966
7,400.00	9.04	93.55	7,349.13	-41.32	666.15	478,027.31	740,111.72	32.312530	-103.689916
7,500.00	9.04	93.55	7,447.89	-42.30	681.82	478,026.33	740,127.40	32.312527	-103.689865
7,600.00	9.04	93.55	7,546.65	-43.27	697.50	478,025.36	740,143.08	32.312524	-103.689814
7,700.00	9.04	93.55	7,645.41	-44.24	713.18	478,024.39	740,158.75	32.312521	-103.689763
7,800.00	9.04	93.55	7,744.17	-45.21	728.86	478,023.42	740,174.43	32.312518	-103.689713
7,900.00	9.04	93.55	7,842.93	-46.19	744.53	478,022.44	740,190.11	32.312515	-103.689662
7,990.21	9.04	93.55	7,932.01	-47.06	758.68	478,021.57	740,204.25	32.312513	-103.689616
8,000.00	8.89	93.55	7,941.69	-47.16	760.20	478,021.47	740,205.77	32.312512	-103.689611
8,100.00	7.39	93.55	8,040.68	-48.04	774.33	478,020.60	740,219.91	32.312510	-103.689565
8,200.00	5.89	93.55	8,140.00	-48.75	785.87	478,019.88	740,231.45	32.312507	-103.689528
8,300.00	4.39	93.55	8,239.60	-49.31	794.81	478,019.32	740,240.39	32.312506	-103.689499
8,400.00	2.89	93.55	8,339.39	-49.70	801.15	478,018.93	740,246.73	32.312505	-103.689479
8,500.00	1.39	93.55	8,439.32	-49.93	804.88	478,018.70	740,250.45	32.312504	-103.689467
8,592.69	0.00	0.00	8,532.00	-50.00	806.00	478,018.63	740,251.57	32.312504	-103.689463
8,600.00	0.00	0.00	8,539.31	-50.00	806.00	478,018.63	740,251.57	32.312504	-103.689463
8,700.00	0.00	0.00	8,639.31	-50.00	806.00	478,018.63	740,251.57	32.312504	-103.689463
8,800.00	0.00	0.00	8,739.31	-50.00	806.00	478,018.63	740,251.57	32.312504	-103.689463
8,900.00	0.00	0.00	8,839.31	-50.00	806.00	478,018.63	740,251.57	32.312504	-103.689463
8,942.73	0.00	0.00	8,882.04	-50.00	806.00	478,018.63	740,251.57	32.312504	-103.689463
KOP @ 8943' MD, 252' FSL, 400' FEL									
9,000.00	5.73	179.63	8,939.22	-52.86	806.02	478,015.77	740,251.59	32.312496	-103.689463
9,100.00	15.73	179.63	9,037.34	-71.45	806.14	477,997.18	740,251.71	32.312445	-103.689463
9,200.00	25.73	179.63	9,130.75	-106.80	806.36	477,961.84	740,251.94	32.312348	-103.689463
9,300.00	35.73	179.63	9,216.60	-157.82	806.69	477,910.81	740,252.26	32.312207	-103.689463
9,400.00	45.73	179.63	9,292.29	-222.99	807.11	477,845.65	740,252.68	32.312028	-103.689463
9,500.00	55.73	179.63	9,355.51	-300.30	807.60	477,768.33	740,253.17	32.311816	-103.689463
9,502.06	55.93	179.63	9,356.67	-302.00	807.61	477,766.63	740,253.19	32.311811	-103.689463
Cross Sect/NM062223 @ 9502' MD, 0' FNL, 400' FEL									
9,600.00	65.73	179.63	9,404.35	-387.42	808.16	477,681.21	740,253.73	32.311576	-103.689463
9,615.90	67.32	179.63	9,410.68	-402.00	808.25	477,666.63	740,253.83	32.311536	-103.689463
FTP @ 9616' MD, 100' FNL, 400' FEL									
9,700.00	75.73	179.63	9,437.31	-481.69	808.76	477,586.94	740,254.33	32.311317	-103.689462
9,800.00	85.73	179.63	9,453.41	-580.26	809.39	477,488.37	740,254.96	32.311046	-103.689462
9,842.73	90.00	179.63	9,455.00	-622.95	809.66	477,445.68	740,255.24	32.310929	-103.689462

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3635.00ft
Project:	Lea County (NAD83 New Mexico East)	MD Reference:	RKB @ 3635.00ft
Site:	Sec 08-T23S-R32E	North Reference:	Grid
Well:	Alley Cat 17-20 Fed Com 526H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
9,900.00	90.00	179.63	9,455.00	-680.22	810.03	477,388.42	740,255.60	32.310771	-103.689462
10,000.00	90.00	179.63	9,455.00	-780.21	810.67	477,288.42	740,256.24	32.310497	-103.689462
10,100.00	90.00	179.63	9,455.00	-880.21	811.31	477,188.42	740,256.88	32.310222	-103.689462
10,200.00	90.00	179.63	9,455.00	-980.21	811.95	477,088.42	740,257.52	32.309947	-103.689462
10,300.00	90.00	179.63	9,455.00	-1,080.21	812.59	476,988.43	740,258.16	32.309672	-103.689462
10,400.00	90.00	179.63	9,455.00	-1,180.21	813.22	476,888.43	740,258.80	32.309397	-103.689462
10,500.00	90.00	179.63	9,455.00	-1,280.20	813.86	476,788.43	740,259.44	32.309122	-103.689461
10,600.00	90.00	179.63	9,455.00	-1,380.20	814.50	476,688.43	740,260.08	32.308847	-103.689461
10,700.00	90.00	179.63	9,455.00	-1,480.20	815.14	476,588.43	740,260.72	32.308572	-103.689461
10,800.00	90.00	179.63	9,455.00	-1,580.20	815.78	476,488.44	740,261.36	32.308298	-103.689461
10,900.00	90.00	179.63	9,455.00	-1,680.20	816.42	476,388.44	740,262.00	32.308023	-103.689461
11,000.00	90.00	179.63	9,455.00	-1,780.19	817.06	476,288.44	740,262.63	32.307748	-103.689461
11,100.00	90.00	179.63	9,455.00	-1,880.19	817.70	476,188.44	740,263.27	32.307473	-103.689461
11,200.00	90.00	179.63	9,455.00	-1,980.19	818.34	476,088.45	740,263.91	32.307198	-103.689461
11,300.00	90.00	179.63	9,455.00	-2,080.19	818.98	475,988.45	740,264.55	32.306923	-103.689460
11,400.00	90.00	179.63	9,455.00	-2,180.18	819.62	475,888.45	740,265.19	32.306648	-103.689460
11,500.00	90.00	179.63	9,455.00	-2,280.18	820.26	475,788.45	740,265.83	32.306373	-103.689460
11,600.00	90.00	179.63	9,455.00	-2,380.18	820.90	475,688.45	740,266.47	32.306099	-103.689460
11,700.00	90.00	179.63	9,455.00	-2,480.18	821.53	475,588.46	740,267.11	32.305824	-103.689460
11,800.00	90.00	179.63	9,455.00	-2,580.18	822.17	475,488.46	740,267.75	32.305549	-103.689460
11,900.00	90.00	179.63	9,455.00	-2,680.17	822.81	475,388.46	740,268.39	32.305274	-103.689460
12,000.00	90.00	179.63	9,455.00	-2,780.17	823.45	475,288.46	740,269.03	32.304999	-103.689460
12,100.00	90.00	179.63	9,455.00	-2,880.17	824.09	475,188.47	740,269.67	32.304724	-103.689459
12,161.83	90.00	179.63	9,455.00	-2,942.00	824.49	475,126.64	740,270.06	32.304554	-103.689459
Cross NM097891 @ 12162' MD, 2640' FSL, 400' FEL									
12,200.00	90.00	179.63	9,455.00	-2,980.17	824.73	475,088.47	740,270.31	32.304449	-103.689459
12,300.00	90.00	179.63	9,455.00	-3,080.17	825.37	474,988.47	740,270.94	32.304174	-103.689459
12,400.00	90.00	179.63	9,455.00	-3,180.16	826.01	474,888.47	740,271.58	32.303900	-103.689459
12,500.00	90.00	179.63	9,455.00	-3,280.16	826.65	474,788.47	740,272.22	32.303625	-103.689459
12,600.00	90.00	179.63	9,455.00	-3,380.16	827.29	474,688.48	740,272.86	32.303350	-103.689459
12,700.00	90.00	179.63	9,455.00	-3,480.16	827.93	474,588.48	740,273.50	32.303075	-103.689459
12,800.00	90.00	179.63	9,455.00	-3,580.16	828.57	474,488.48	740,274.14	32.302800	-103.689459
12,900.00	90.00	179.63	9,455.00	-3,680.15	829.20	474,388.48	740,274.78	32.302525	-103.689458
13,000.00	90.00	179.63	9,455.00	-3,780.15	829.84	474,288.49	740,275.42	32.302250	-103.689458
13,100.00	90.00	179.63	9,455.00	-3,880.15	830.48	474,188.49	740,276.06	32.301975	-103.689458
13,200.00	90.00	179.63	9,455.00	-3,980.15	831.12	474,088.49	740,276.70	32.301701	-103.689458
13,300.00	90.00	179.63	9,455.00	-4,080.15	831.76	473,988.49	740,277.34	32.301426	-103.689458
13,400.00	90.00	179.63	9,455.00	-4,180.14	832.40	473,888.50	740,277.98	32.301151	-103.689458
13,500.00	90.00	179.63	9,455.00	-4,280.14	833.04	473,788.50	740,278.62	32.300876	-103.689458
13,600.00	90.00	179.63	9,455.00	-4,380.14	833.68	473,688.50	740,279.25	32.300601	-103.689458
13,700.00	90.00	179.63	9,455.00	-4,480.14	834.32	473,588.50	740,279.89	32.300326	-103.689457
13,800.00	90.00	179.63	9,455.00	-4,580.14	834.96	473,488.50	740,280.53	32.300051	-103.689457
13,900.00	90.00	179.63	9,455.00	-4,680.13	835.60	473,388.51	740,281.17	32.299776	-103.689457
14,000.00	90.00	179.63	9,455.00	-4,780.13	836.24	473,288.51	740,281.81	32.299502	-103.689457
14,100.00	90.00	179.63	9,455.00	-4,880.13	836.88	473,188.51	740,282.45	32.299227	-103.689457
14,200.00	90.00	179.63	9,455.00	-4,980.13	837.51	473,088.51	740,283.09	32.298952	-103.689457
14,300.00	90.00	179.63	9,455.00	-5,080.13	838.15	472,988.52	740,283.73	32.298677	-103.689457
14,400.00	90.00	179.63	9,455.00	-5,180.12	838.79	472,888.52	740,284.37	32.298402	-103.689457
14,500.00	90.00	179.63	9,455.00	-5,280.12	839.43	472,788.52	740,285.01	32.298127	-103.689456
14,600.00	90.00	179.63	9,455.00	-5,380.12	840.07	472,688.52	740,285.65	32.297852	-103.689456
14,700.00	90.00	179.63	9,455.00	-5,480.12	840.71	472,588.52	740,286.29	32.297577	-103.689456
14,800.00	90.00	179.63	9,455.00	-5,580.12	841.35	472,488.53	740,286.92	32.297303	-103.689456
14,801.88	90.00	179.63	9,455.00	-5,582.00	841.36	472,486.65	740,286.94	32.297297	-103.689456
Cross Sect/NM086153 @ 14802' MD, 0' FNL, 400' FEL									

Planning Report - Geographic

Database:	EDM r5000.141_Proc US	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3635.00ft
Project:	Lea County (NAD83 New Mexico East)	MD Reference:	RKB @ 3635.00ft
Site:	Sec 08-T23S-R32E	North Reference:	Grid
Well:	Alley Cat 17-20 Fed Com 526H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
14,900.00	90.00	179.63	9,455.00	-5,680.11	841.99	472,388.53	740,287.56	32.297028	-103.689456
15,000.00	90.00	179.63	9,455.00	-5,780.11	842.63	472,288.53	740,288.20	32.296753	-103.689456
15,100.00	90.00	179.63	9,455.00	-5,880.11	843.27	472,188.53	740,288.84	32.296478	-103.689456
15,200.00	90.00	179.63	9,455.00	-5,980.11	843.91	472,088.54	740,289.48	32.296203	-103.689456
15,300.00	90.00	179.63	9,455.00	-6,080.11	844.55	471,988.54	740,290.12	32.295928	-103.689455
15,400.00	90.00	179.63	9,455.00	-6,180.10	845.19	471,888.54	740,290.76	32.295653	-103.689455
15,500.00	90.00	179.63	9,455.00	-6,280.10	845.82	471,788.54	740,291.40	32.295378	-103.689455
15,600.00	90.00	179.63	9,455.00	-6,380.10	846.46	471,688.54	740,292.04	32.295104	-103.689455
15,700.00	90.00	179.63	9,455.00	-6,480.10	847.10	471,588.55	740,292.68	32.294829	-103.689455
15,800.00	90.00	179.63	9,455.00	-6,580.10	847.74	471,488.55	740,293.32	32.294554	-103.689455
15,900.00	90.00	179.63	9,455.00	-6,680.09	848.38	471,388.55	740,293.96	32.294279	-103.689455
16,000.00	90.00	179.63	9,455.00	-6,780.09	849.02	471,288.55	740,294.60	32.294004	-103.689455
16,100.00	90.00	179.63	9,455.00	-6,880.09	849.66	471,188.56	740,295.23	32.293729	-103.689454
16,200.00	90.00	179.63	9,455.00	-6,980.09	850.30	471,088.56	740,295.87	32.293454	-103.689454
16,300.00	90.00	179.63	9,455.00	-7,080.08	850.94	470,988.56	740,296.51	32.293179	-103.689454
16,400.00	90.00	179.63	9,455.00	-7,180.08	851.58	470,888.56	740,297.15	32.292905	-103.689454
16,500.00	90.00	179.63	9,455.00	-7,280.08	852.22	470,788.56	740,297.79	32.292630	-103.689454
16,600.00	90.00	179.63	9,455.00	-7,380.08	852.86	470,688.57	740,298.43	32.292355	-103.689454
16,700.00	90.00	179.63	9,455.00	-7,480.08	853.50	470,588.57	740,299.07	32.292080	-103.689454
16,800.00	90.00	179.63	9,455.00	-7,580.07	854.13	470,488.57	740,299.71	32.291805	-103.689454
16,900.00	90.00	179.63	9,455.00	-7,680.07	854.77	470,388.57	740,300.35	32.291530	-103.689453
17,000.00	90.00	179.63	9,455.00	-7,780.07	855.41	470,288.58	740,300.99	32.291255	-103.689453
17,100.00	90.00	179.63	9,455.00	-7,880.07	856.05	470,188.58	740,301.63	32.290980	-103.689453
17,200.00	90.00	179.63	9,455.00	-7,980.07	856.69	470,088.58	740,302.27	32.290706	-103.689453
17,300.00	90.00	179.63	9,455.00	-8,080.06	857.33	469,988.58	740,302.91	32.290431	-103.689453
17,400.00	90.00	179.63	9,455.00	-8,180.06	857.97	469,888.58	740,303.54	32.290156	-103.689453
17,500.00	90.00	179.63	9,455.00	-8,280.06	858.61	469,788.59	740,304.18	32.289881	-103.689453
17,600.00	90.00	179.63	9,455.00	-8,380.06	859.25	469,688.59	740,304.82	32.289606	-103.689453
17,700.00	90.00	179.63	9,455.00	-8,480.06	859.89	469,588.59	740,305.46	32.289331	-103.689452
17,800.00	90.00	179.63	9,455.00	-8,580.05	860.53	469,488.59	740,306.10	32.289056	-103.689452
17,900.00	90.00	179.63	9,455.00	-8,680.05	861.17	469,388.60	740,306.74	32.288781	-103.689452
18,000.00	90.00	179.63	9,455.00	-8,780.05	861.80	469,288.60	740,307.38	32.288507	-103.689452
18,100.00	90.00	179.63	9,455.00	-8,880.05	862.44	469,188.60	740,308.02	32.288232	-103.689452
18,200.00	90.00	179.63	9,455.00	-8,980.05	863.08	469,088.60	740,308.66	32.287957	-103.689452
18,300.00	90.00	179.63	9,455.00	-9,080.04	863.72	468,988.60	740,309.30	32.287682	-103.689452
18,400.00	90.00	179.63	9,455.00	-9,180.04	864.36	468,888.61	740,309.94	32.287407	-103.689452
18,500.00	90.00	179.63	9,455.00	-9,280.04	865.00	468,788.61	740,310.58	32.287132	-103.689451
18,600.00	90.00	179.63	9,455.00	-9,380.04	865.64	468,688.61	740,311.21	32.286857	-103.689451
18,700.00	90.00	179.63	9,455.00	-9,480.04	866.28	468,588.61	740,311.85	32.286582	-103.689451
18,800.00	90.00	179.63	9,455.00	-9,580.03	866.92	468,488.62	740,312.49	32.286308	-103.689451
18,900.00	90.00	179.63	9,455.00	-9,680.03	867.56	468,388.62	740,313.13	32.286033	-103.689451
19,000.00	90.00	179.63	9,455.00	-9,780.03	868.20	468,288.62	740,313.77	32.285758	-103.689451
19,100.00	90.00	179.63	9,455.00	-9,880.03	868.84	468,188.62	740,314.41	32.285483	-103.689451
19,200.00	90.00	179.63	9,455.00	-9,980.03	869.48	468,088.62	740,315.05	32.285208	-103.689451
19,300.00	90.00	179.63	9,455.00	-10,080.02	870.11	467,988.63	740,315.69	32.284933	-103.689450
19,400.00	90.00	179.63	9,455.00	-10,180.02	870.75	467,888.63	740,316.33	32.284658	-103.689450
19,500.00	90.00	179.63	9,455.00	-10,280.02	871.39	467,788.63	740,316.97	32.284383	-103.689450
19,600.00	90.00	179.63	9,455.00	-10,380.02	872.03	467,688.63	740,317.61	32.284109	-103.689450
19,700.00	90.00	179.63	9,455.00	-10,480.02	872.67	467,588.64	740,318.25	32.283834	-103.689450
19,800.00	90.00	179.63	9,455.00	-10,580.01	873.31	467,488.64	740,318.89	32.283559	-103.689450
19,900.00	90.00	179.63	9,455.00	-10,680.01	873.95	467,388.64	740,319.52	32.283284	-103.689450
19,975.16	90.00	179.63	9,455.00	-10,755.17	874.43	467,313.48	740,320.01	32.283077	-103.689450
LTP @ 19975' MD, 100' FSL, 400' FEL									
20,000.00	90.00	179.63	9,455.00	-10,780.01	874.59	467,288.64	740,320.16	32.283009	-103.689450

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Alley Cat 17-20 Fed Com 526H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 3635.00ft
Project:	Lea County (NAD83 New Mexico East)	MD Reference:	RKB @ 3635.00ft
Site:	Sec 08-T23S-R32E	North Reference:	Grid
Well:	Alley Cat 17-20 Fed Com 526H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 1		

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
20,055.16	90.00	179.63	9,455.00	-10,835.17	874.94	467,233.48	740,320.52	32.282857	-103.689449
PBHL; 20' FSL, 400' FEL									

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 - Alley Cat 17-20 I	0.00	0.00	0.00	-10,835.17	874.94	467,233.48	740,320.52	32.282857	-103.689449
- plan misses target center by 9455.00ft at 20055.16ft MD (9455.00 TVD, -10835.17 N, 874.94 E)									
- Point									

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
8,942.73	8,882.04	-50.00	806.00	KOP @ 8943' MD, 252' FSL, 400' FEL
9,502.06	9,356.67	-302.00	807.61	Cross Sect/NM062223 @ 9502' MD, 0' FNL, 400' FEL
9,615.90	9,410.68	-402.00	808.25	FTP @ 9616' MD, 100' FNL, 400' FEL
12,161.83	9,455.00	-2,942.00	824.49	Cross NM097891 @ 12162' MD, 2640' FSL, 400' FEL
14,801.88	9,455.00	-5,582.00	841.36	Cross Sect/NM086153 @ 14802' MD, 0' FNL, 400' FEL
19,975.16	9,455.00	-10,755.17	874.43	LTP @ 19975' MD, 100' FSL, 400' FEL
20,055.16	9,455.00	-10,835.17	874.94	PBHL; 20' FSL, 400' FEL

Sec.

North
-0.34°
6.51°

Field
5.2snT
60.11°
3/2018
F2015

Devon Energy – Alley Cat 17-20 Fed Com 526H

1. Geologic Formations

TVD of target	9455	Pilot hole depth	N/A
MD at TD:	20055	Deepest expected fresh water:	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Rustler	1048		
Salado	1423		
Base of Salt	4643		
Delaware	4673		
L Brushy Canyon	8293		
Bone Spring	8648		
Leonard 'A'	8748		
Leonard 'B'	9283		
Landing Point	9455		

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

Devon Energy – Alley Cat 17-20 Fed Com 526H

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (PPF)	Grade	Conn.
	From	To				
17.5"	0	1073	13.375"	48	H-40	STC
12.25"	0	4773	9.625"	40	J-55	BTC
8.75"	0	TD	5.5"	17	P-110	BTC
BLM Minimum Safety Factor				Collapse: 1.125	Burst: 1.00	Tension: 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.
- 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.
- Int casing shoe will be selected based on drilling data, gamma, and flows experienced while drilling. Setting depth will be revised accordingly if needed.
- A variance is requested to waive the centralizer requirement for the intermediate and production casing strings if drilling conditions dictate

Devon Energy – Alley Cat 17-20 Fed Com 526H

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

Devon Energy – Alley Cat 17-20 Fed Com 526H

3. Cementing Program (3-String Primary Design)

Casing	# Sks	TOC	Wt. (lb/gal)	H ₂ O (gal/sk)	Yld (ft ³ /sack)	Slurry Description
Surface	1120	Surf	13.2	6.33	1.33	Lead: Class C Cement + additives
Int	434	Surf	9	20.6	3.27	Lead: Class C Cement + additives
	196	500' above shoe	13.2	6.42	1.33	Tail: Class H / C + additives
Production	398	500' tieback	9	20.6	3.27	Lead: Class H / C + additives
	2321	KOP	13.2	5.31	1.33	Tail: 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	100%
Intermediate	50%
Production	10%

Devon Energy – Alley Cat 17-20 Fed Com 526H

4. Pressure Control Equipment

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"	5M	Annular(5M)	X	50% of rated working pressure
			Blind Ram	X	5M
			Pipe Ram		
			Double Ram	X	
			Other *		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other *		

Devon Energy – Alley Cat 17-20 Fed Com 526H

5. Mud Program

6. Depth		Type	Weight (ppg)	Vis	Water Loss
From	To				
0	1073	FW	8.5 – 9.0	28-34	N/C
1073	4773	Brine	10 – 10.5	28-34	N/C
4773	TD	WBM	8.5 – 9.0	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	Production casing
X Mud log	KOP to TD

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4425 psi
Abnormal Temperature	No

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

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S 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	H2S is present
Y	H2S Plan attached

Devon Energy – Alley Cat 17-20 Fed Com 526H

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

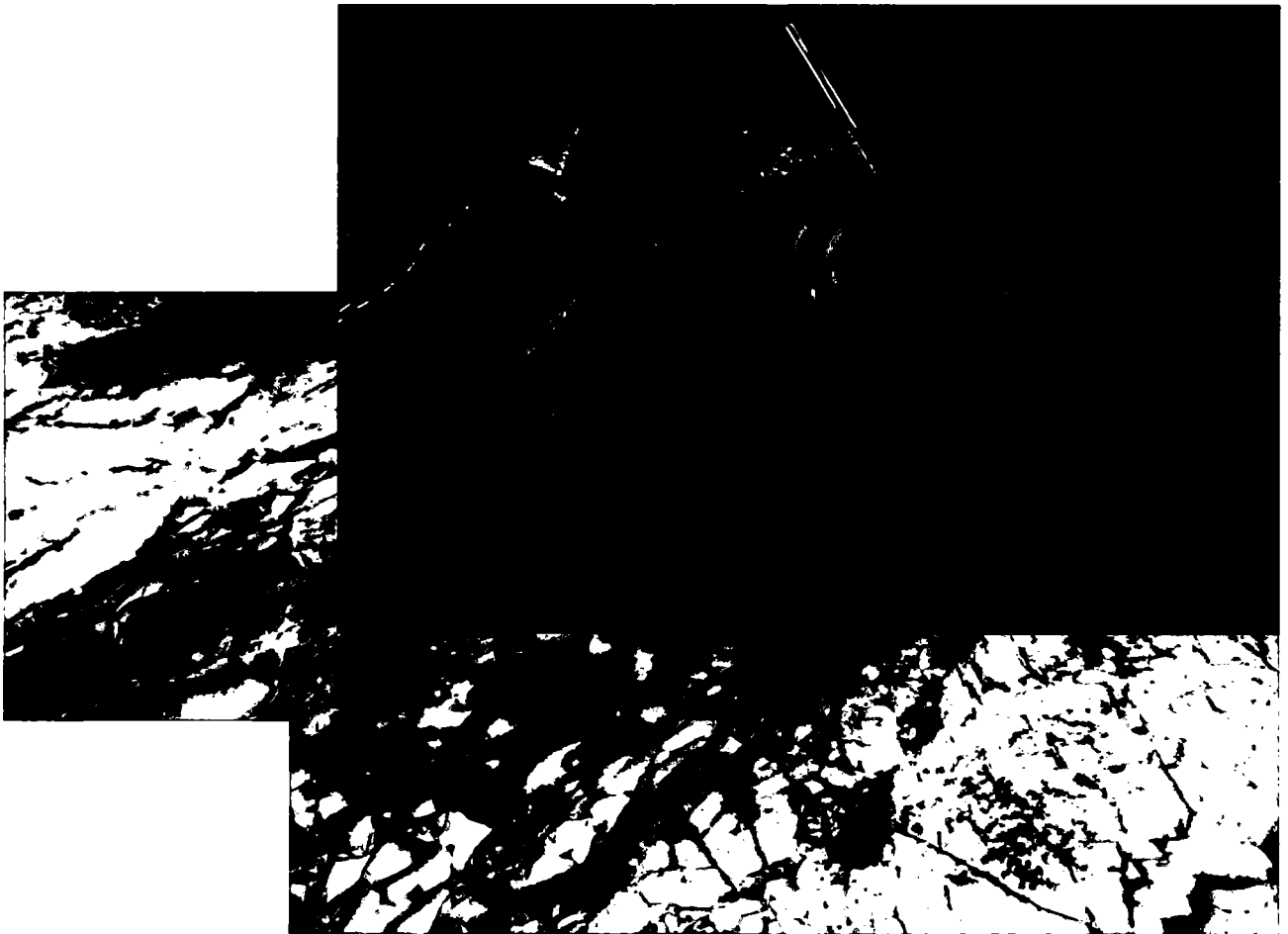
1. Spudder rig will move in and drill surface hole.
 - a. Rig will utilize fresh water based mud to drill surface hole to TD. Solids control will be handled entirely on a closed loop basis.
2. After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable 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



Commitment Runs Deep



Design Plan
Operation and Maintenance Plan
Closure Plan

SENM - Closed Loop Systems
June 2010

I. Design Plan

Devon uses MI SWACO closed loop system (CLS). The MI SWACO CLS is designed to maintain drill solids at or below 5%. The equipment is arranged to progressively remove solids from the largest to the smallest size. Drilling fluids can thus be reused and savings is realized on mud and disposal costs. Dewatering may be required with the centrifuges to insure removal of ultra fine solids.

The drilling location is constructed to allow storm water to flow to a central sump normally the cellar. This insures no contamination leaves the drilling pad in the event of a spill. Storm water is reused in the mud system or stored in a reserve fluid tank farm until it can be reused. All lubricants, oils, or chemicals are removed immediately from the ground to prevent the contamination of storm water. An oil trap is normally installed on the sump if an oil spill occurs during a storm.

A tank farm is utilized to store drilling fluids including fresh water and brine fluids. The tank farm is constructed on a 20 ml plastic lined, bermed pad to prevent the contamination of the drilling site during a spill. Fluids from other sites may be stored in these tanks for processing by the solids control equipment and reused in the mud system. At the end of the well the fluids are transported from the tank farm to an adjoining well or to the next well for the rig.

Prior to installing a closed-loop system on site, the topsoil, if present, will be stripped and stockpiled for use as the final cover or fill at the time of closure.

Signs will be posted on the fence surrounding the closed-loop system unless the closed-loop system is located on a site where there is an existing well, that is operated by Devon.

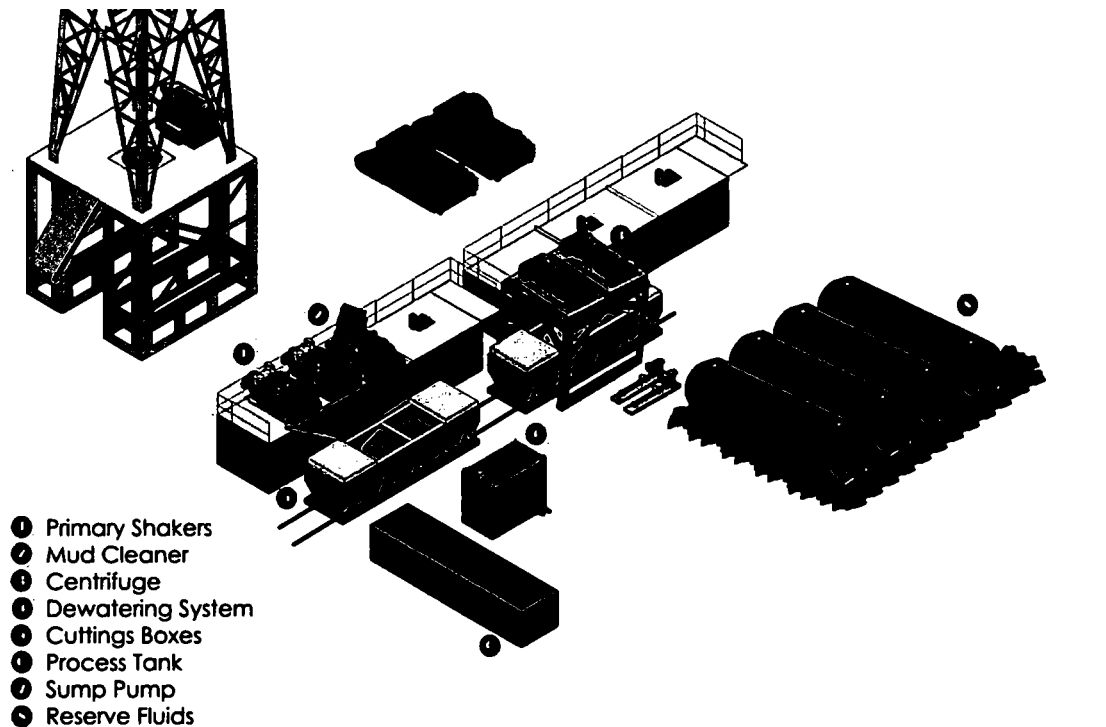
II. Operations and Maintenance Plan

Primary Shakers: The primary shakers make the first removal of drill solids from the drilling mud as it leaves the well bore. The shakers are sized to handle maximum drilling rate at optimal screen size. The shakers normally remove solids down to 74 microns.

Mud Cleaner: The Mud Cleaner cleans the fluid after it leaves the shakers. A set of hydrocyclones are sized to handle 1.25 to 1.5 times the maximum circulating rate. This ensures all the fluid is being processed to an average cut point of 25 microns. The wet discharged is dewatered on a shaker equipped with ultra fine mesh screens and generally cut at 40 microns.



Closed Loop Schematic



Centrifuges: The centrifuges can be one or two in number depending on the well geometry or depth of well. The centrifuges are sized to maintain low gravity solids at 5% or below. They may or may not need a dewatering system to enhance the removal rates. The centrifuges can make a cut point of 8-10 microns depending on bowl speed, feed rate, solids loading and other factors.

The centrifuge system is designed to work on the active system and be flexible to process incoming fluids from other locations. This set-up is also dependant on well factors.

Dewatering System: The dewatering system is a chemical mixing and dosing system designed to enhance the solids removal of the centrifuge. Not commonly used in shallow wells. It may contain pH adjustment, coagulant mixing and dosing, and polymer mixing and dosing. Chemical flocculation binds ultra fine solids into a mass that is within the centrifuge operating design. The

dewatering system improves the centrifuge cut point to infinity or allows for the return of clear water or brine fluid. This ability allows for the ultimate control of low gravity solids.

Cuttings Boxes: Cuttings boxes are utilized to capture drill solids that are discarded from the solids control equipment. These boxes are set upon a rail system that allows for the removal and replacement of a full box of cuttings with an empty one. They are equipped with a cover that insures no product is spilled into the environment during the transportation phase.

Process Tank: (Optional) The process tank allows for the holding and process of fluids that are being transferred into the mud system. Additionally, during times of lost circulation the process tank may hold active fluids that are removed for additional treatment. It can further be used as a mixing tank during well control conditions.

Sump and Sump Pump: The sump is used to collect storm water and the pump is used to transfer this fluid to the active system or to the tank for to hold in reserve. It can also be used to collect fluids that may escape during spills. The location contains drainage ditches that allow the location fluids to drain to the sump.

Reserve Fluids (Tank Farm): A series of frac tanks are used to replace the reserve pit. These are steel tanks that are equipped with a manifold system and a transfer pump. These tanks can contain any number of fluids used during the drilling process. These can include fresh water, cut brine, and saturated salt fluid. The fluid can be from the active well or reclaimed fluid from other locations. A 20 ml liner and berm system is employed to ensure the fluids do not migrate to the environment during a spill.

If a leak develops, the appropriate division district office will be notified within 48 hours of the discovery and the leak will be addressed. Spill prevention is accomplished by maintaining pump packing, hoses, and pipe fittings to insure no leaks are occurring. During an upset condition the source of the spill is isolated and repaired as soon as it is discovered. Free liquid is removed by a diaphragm pump and returned to the mud system. Loose topsoil may be used to stabilize the spill and the contaminated soil is excavated and placed in the cuttings boxes. After the well is finished and the rig has moved, the entire location is scrapped and testing will be performed to determine if a release has occurred.

All trash is kept in a wire mesh enclosure and removed to an approved landfill when full. All spent motor oils are kept in separate containers and they are removed and sent to an approved recycling center. Any spilled lubricants, pipe

dope, or regulated chemicals are removed from soil and sent to landfills approved for these products.

These operations are monitored by Mi Swaco service technicians. Daily logs are maintained to ensure optimal equipment operation and maintenance. Screen and chemical use is logged to maintain inventory control. Fluid properties are monitored and recorded and drilling mud volumes are accounted for in the mud storage farm. This data is kept for end of well review to insure performance goals are met. Lessons learned are logged and used to help with continuous improvement.

A MI SWACO field supervisor manages from 3-5 wells. They are responsible for training personnel, supervising installations, and inspecting sites for compliance of MI SWACO safety and operational policy.

III. Closure Plan

A maximum 340' X 340' caliche pad is built per well. All of the trucks and steel tanks fit on this pad. All fluid cuttings go to the steel tanks to be hauled by various trucking companies to an agency approved disposal.

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. 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 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 13-3/8" surface casing, a 13-5/8" 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 9-5/8" intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 5M will already 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 5,000 psi WP.

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

Devon Energy
APD VARIANCE DATA

OPERATOR NAME: Devon Energy

1. SUMMARY OF Variance:

Devon Energy respectfully requests approval for the following additions to the drilling plan:

1. Potential utilization of a spudder rig to pre-set surface casing.

2. Description of Operations

1. A spudder rig contractor may move in their rig to drill the surface hole section and pre-set surface casing on this well.
 - a. After drilling the surface hole section, the rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
 - b. Rig will utilize fresh water based mud to drill surface hole to TD.
2. The wellhead will be installed and tested once the surface casing is cut off and the WOC time has been reached.
3. A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with needle valves installed on two wingvalves.
 - a. A means for intervention will be maintained while the drilling rig is not over the well.
4. The BLM will be contacted and notified 24 hours prior to commencing spudder rig operations.
5. Drilling operation will be performed with the big 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 BLM will be contacted / notified 24 hours before the big rig moves back on to the pad with the pre-set surface casing.
6. Devon Energy will have supervision on the rig to ensure compliance with all BLM and NMOCD regulations and to oversee operations.
7. Once the rig is removed, Devon Energy will secure the wellhead area by placing a guard rail around the cellar area.



Fluid Technology

ContiTech Beattie Corp.
Website: www.contitechbeattie.com

Monday, June 14, 2010

RE: Drilling & Production Hoses
Lifting & Safety Equipment

To Helmerich & Payne,

A Continental Contitech hose assembly can perform as intended and suitable for the application regardless of whether the hose is secured or unsecured in its configuration. As a manufacturer of High Pressure Hose Assemblies for use in Drilling & Production, we do offer the corresponding lifting and safety equipment, this has the added benefit of easing the lifting and handling of each hose assembly whilst affording hose longevity by ensuring correct handling methods and procedures as well as securing the hose in the unlikely event of a failure; but in no way does the lifting and safety equipment affect the performance of the hoses providing the hoses have been handled and installed correctly. It is good practice to use lifting & safety equipment but not mandatory.

Should you have any questions or require any additional information/clarifications then please do not hesitate to contact us.

ContiTech Beattie is part of the Continental AG Corporation and can offer the full support resources associated with a global organization.

Best regards,

Robin Hodgson
Sales Manager
ContiTech Beattie Corp

ContiTech Beattie Corp,
11535 Brittmoore Park Drive,
Houston, TX 77041
Phone: +1 (832) 327-0141
Fax: +1 (832) 327-0148
www.contitechbeattie.com



RIG 212



QUALITY DOCUMENT

**PHOENIX RUBBER
INDUSTRIAL LTD.**

 6728 Szeged, Budapesti út 10. Hungary • H-6701 Szeged, P. O. Box 152
 Phone: (3682) 566-737 • Fax: (3682) 566-738

 SALES & MARKETING: H-1092 Budapest, Róday u. 42-44. Hungary • H-1440 Budapest, P. O. Box 26
 Phone: (361) 456-4200 • Fax: (361) 217-2972, 456-4273 • www.taurusemerg.hu

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE				CERT. N°: 552	
PURCHASER: Phoenix Beattie Co.			P.O. N°: 1519FA-871		
PHOENIX RUBBER order N°: 170466		HOSE TYPE: 3" ID Choke and Kill Hose			
HOSE SERIAL N°: 34128		NOMINAL / ACTUAL LENGTH: 11,43 m			
W.P. 68,96 MPa 10000 psi		T.P. 103,4 MPa 15000 psi		Duration: 60 min.	
Pressure test with water at ambient temperature See attachment. (1 page)					
↑ 10 mm = 10 Min. → 10 mm = 25 MPa					
COUPLINGS					
Type	Serial N°		Quality	Heat N°	
3" coupling with 4 1/16" Flange end	720	719	AISI 4130	C7626	
			AISI 4130	47357	
API Spec 16 C Temperature rate: "B"					
All metal parts are flawless					
WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.					
Date:	Inspector		Quality Control		
29. April. 2002.			PHOENIX RUBBER Industrial Ltd. Hose Inspection and Pressure Test Dept. PHOENIX RUBBER S.C.		

14094-65

40920-0-00015 N800L

6	6.4	6.000	6.000	14.00
5	5.4	5.000	5.000	14.00
4	4.4	4.000	4.000	14.00
3	3.4	3.000	3.000	14.00
2	2.4	2.000	2.000	14.00
1	1.4	1.000	1.000	14.00
0	0.4	0.000	0.000	14.00
7	7.4	7.000	7.000	14.00
6	6.4	6.000	6.000	14.00
5	5.4	5.000	5.000	14.00
4	4.4	4.000	4.000	14.00
3	3.4	3.000	3.000	14.00
2	2.4	2.000	2.000	14.00
1	1.4	1.000	1.000	14.00
0	0.4	0.000	0.000	14.00

[Signature]
PHOENIX RUBBER
 Industrial Ltd.
 Hose Inspection and
 Certification Dept.

VERIFIED TRUE CO.
 PHOENIX RUBBER CO.

APD ID: 10400037301

Submission Date: 12/14/2018

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Well Type: OIL WELL

Well Work Type: Drill

[Show Final Text](#)

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

ALLEY_CAT_17_20_FED_COM_526H_EXISTING_RD_20181213143925.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT

Row(s) Exist? NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? NO

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

ALLEY_CAT_17_20_FED_COM_526H_OneMileBuffer_WA017459428_20181213143947.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Existing Wells description:

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? DEFER

Estimated Production Facilities description: Please refer to CTB plat.

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type: STIMULATION

Water source type: OTHER

Describe type:

Source latitude:

Source longitude:

Source datum:

Water source permit type: OTHER

Source land ownership: FEDERAL

Water source transport method: PIPELINE

Source transportation land ownership: STATE

Water source volume (barrels): 270000

Source volume (acre-feet): 34.801136

Source volume (gal): 11340000

Water source and transportation map:

ALLEY_CAT_17_20_FED_COM_524H_525H_526H_WATER_MAP_20181213124410.pdf

Water source comments: The attached Water Transfer Map is a proposal only and the final route and documentation will be provided by a Devon contractor prior to installation. When available Devon will always follow existing disturbance.

New water well? NO

New Water Well Info

Well latitude:

Well Longitude:

Well datum:

Well target aquifer:

Est. depth to top of aquifer(ft):

Est thickness of aquifer:

Aquifer comments:

Aquifer documentation:

Well depth (ft):

Well casing type:

Well casing outside diameter (in.):

Well casing inside diameter (in.):

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

New water well casing?

Used casing source:

Drilling method:

Drill material:

Grout material:

Grout depth:

Casing length (ft.):

Casing top depth (ft.):

Well Production type:

Completion Method:

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: Dirt fill and caliche will be used to construct well pad. Map attached.

Construction Materials source location attachment:

Todd_Apache_MDP2_Pad_8_5_Caliche_map_20181213124741.pdf

Section 7 - Methods for Handling Waste

Waste type: PRODUCED WATER

Waste content description: Average produced BWPD over the first year of production

Amount of waste: 1000 barrels

Waste disposal frequency : Daily

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: OFF-LEASE INJECTION **Disposal location ownership:** PRIVATE

Disposal type description:

Disposal location description: Multiple methods for handling waste will be utilized. Via trucking, Dvn owned disposal system and or third party pipeline take away.

Waste type: COMPLETIONS/STIMULATION

Waste content description: Flow back water during completion operations.

Amount of waste: 3000 barrels

Waste disposal frequency : One Time Only

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Various disposal locations in Lea and Eddy counties.

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Waste type: FLOWBACK

Waste content description: Average produced BWPD over the flowback period (first 30 days of production).

Amount of waste: 2000 barrels

Waste disposal frequency : Daily

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: OFF-LEASE INJECTION **Disposal location ownership:** STATE

Disposal type description:

Disposal location description: Produced water during flowback will be disposed of at various disposals in Lea and Eddy County.

Waste type: DRILLING

Waste content description: Water Based Cuttings

Amount of waste: 1996 barrels

Waste disposal frequency : Daily

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: All cuttings will disposed of at R360, Sundance, or equivalent.

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.) **Reserve pit width (ft.)**

Reserve pit depth (ft.) **Reserve pit volume (cu. yd.)**

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? NO

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Description of cuttings location

Cuttings area length (ft.)

Cuttings area width (ft.)

Cuttings area depth (ft.)

Cuttings area volume (cu. yd.)

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

Alley_Cat_17_20_Fed_Com_526H_RIGLAYOUT_20181213144052.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance

Multiple Well Pad Name: TODD- APACHE MDP 2 PAD

Multiple Well Pad Number: 8-5

Recontouring attachment:

ALLEY_CAT_17_20_FED_COM_526H_RECLAMATION_20181214061317.pdf

Drainage/Erosion control construction: All areas disturbed shall be reclaimed as early and as nearly as practicable to their original condition or their final land use and shall be maintained to control dust and minimize erosion to the extent practicable.

Drainage/Erosion control reclamation: Topsoils and subsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns. The disturbed area then shall be reseeded in the first favorable growing season.

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Well pad proposed disturbance (acres): 6.686	Well pad interim reclamation (acres): 5.033	Well pad long term disturbance (acres): 1.653
Road proposed disturbance (acres): 0.177	Road interim reclamation (acres): 0.177	Road long term disturbance (acres): 0.177
Powerline proposed disturbance (acres): 0	Powerline interim reclamation (acres): 0	Powerline long term disturbance (acres): 0
Pipeline proposed disturbance (acres): 1.672	Pipeline interim reclamation (acres): 0	Pipeline long term disturbance (acres): 0
Other proposed disturbance (acres): 0	Other interim reclamation (acres): 0	Other long term disturbance (acres): 0
Total proposed disturbance: 8.535	Total interim reclamation: 5.21	Total long term disturbance: 1.83

Disturbance Comments:

Reconstruction method: Operator will use Best Management Practices"BMP" to mechanically recontour to obtain the desired outcome.

Topsoil redistribution: Topsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns.

Soil treatment: Topsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns.

Existing Vegetation at the well pad: Shinnery, yucca, grasses and mesquite.

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: Shinnery, yucca, grasses and mesquite.

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline: Shinnery, yucca, grasses and mesquite.

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: Shinnery, yucca, grasses and mesquite.

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Seed harvest description attachment:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Seed Management

Seed Table

Seed type:

Seed source:

Seed name:

Source name:

Source address:

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre:

Proposed seeding season:

Seed Summary

Total pounds/Acre:

Seed Type	Pounds/Acre
-----------	-------------

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: JACOB

Last Name: OCHOA

Phone: (575)748-9934

Email: JACOB.OCHOA@DVN.COM

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: Maintain weeds on an as need basis.

Weed treatment plan attachment:

Monitoring plan description: Monitor as needed.

Monitoring plan attachment:

Success standards: N/A

Pit closure description: N/A

Pit closure attachment:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

Section 11 - Surface Ownership

Disturbance type: PIPELINE

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Disturbance type: NEW ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

USFS Forest/Grassland:

USFS Ranger District:

Disturbance type: EXISTING ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: ALLEY CAT 17-20 FED COM

Well Number: 526H

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Section 12 - Other Information

Right of Way needed? NO

Use APD as ROW?

ROW Type(s):

ROW Applications

SUPO Additional Information: *ALL FLOWLINES ARE BURIED*, CTB Plat, Elec Plats; NMNM138763- does not apply to the wellbore as it will be changing prior to spud. 5/24/2019-talked with Ciji

Use a previously conducted onsite? YES

Previous Onsite information: FEB 2017- Todd Apache MDP 2; Wellpad 8-5

Other SUPO Attachment

AA000111179_TA_MDP2_CTB_8_2_PAD_P_R1_20181213130122.pdf

Alley_Cat_17_20_FC_524H_525H_526H_Flowlines_for_APD_20181213130125.pdf

TODD_APACHE_MDP2_8_5_PAD_EL_P_20181213130132.PDF

Pay.gov__Receipt_20181214061900.pdf

Alley_Cat_17_20_FC_524H_525H_526H_Flowlines_BURIED_20190422123711.pdf

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Describe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well number:

Injection well name:

Assigned injection well API number?

Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

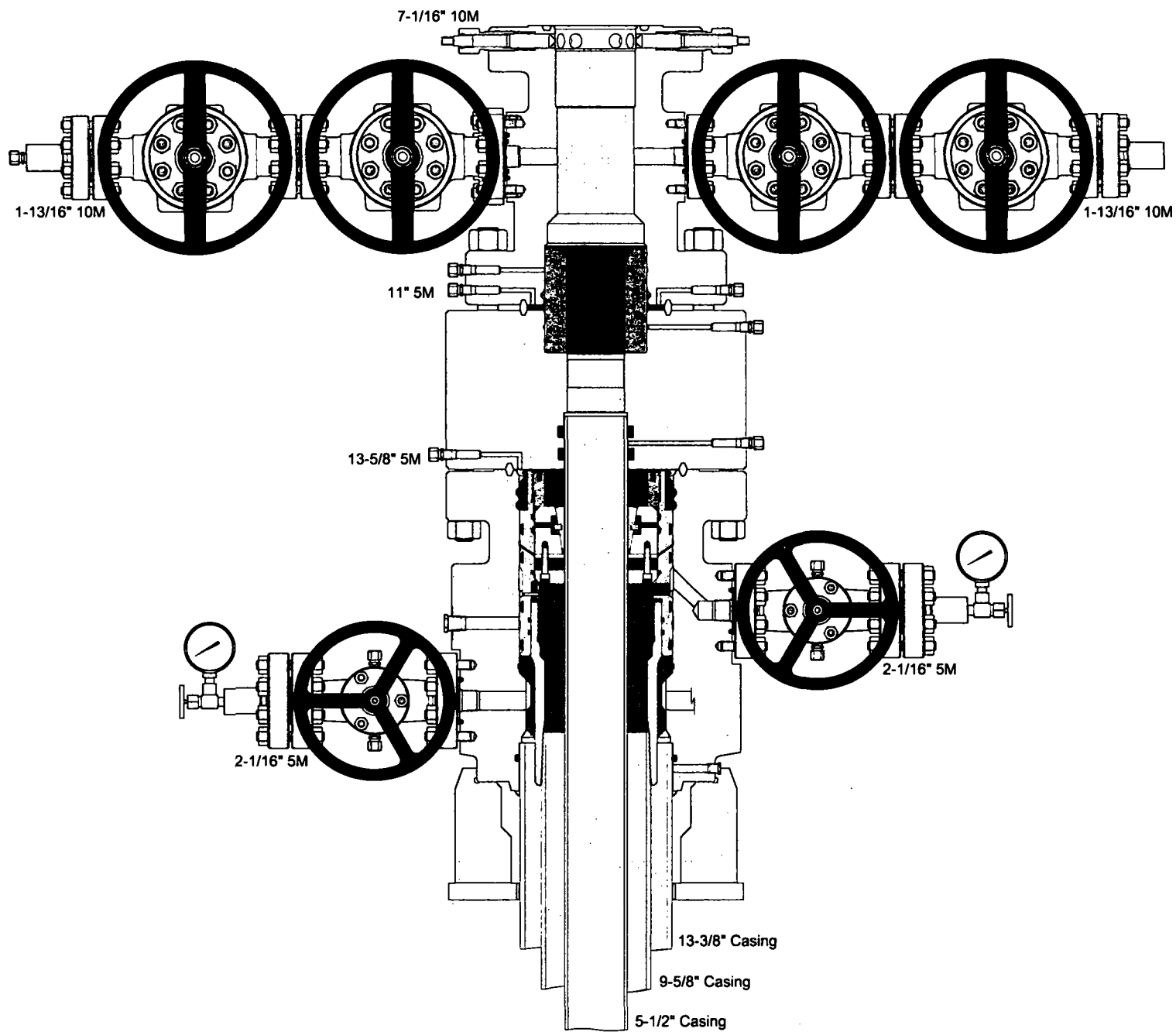
Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:



Bond Information**Federal/Indian APD: FED****BLM Bond number: CO1104****BIA Bond number:****Do you have a reclamation bond? NO****Is the reclamation bond a rider under the BLM bond?****Is the reclamation bond BLM or Forest Service?****BLM reclamation bond number:****Forest Service reclamation bond number:****Forest Service reclamation bond attachment:****Reclamation bond number:****Reclamation bond amount:****Reclamation bond rider amount:****Additional reclamation bond information attachment:**