

NM OIL CONSERVATION
ARTESIA DISTRICT

JAN 31 2018

Form 3160-3
(March 2012)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

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

1a. Type of work: ☒ DRILL ☐ REENTER		5. Lease Serial No. NMNM037489
1b. Type of Well: ☒ Oil Well ☐ Gas Well ☐ Other ☒ Single Zone ☐ Multiple Zone		6. If Indian, Allottee or Tribe Name
2. Name of Operator DEVON ENERGY PRODUCTION COMPANY LP		7. If Unit or CA Agreement, Name and No. NMNM70928X
3a. Address 333 West Sheridan Avenue Oklahoma City OK		8. Lease Name and Well No. COTTON DRAW UNIT 518H
3b. Phone No. (include area code) (405)552-6571		9. API Well No. 30-015-44651
4. Location of Well (Report location clearly and in accordance with any State requirements.)* At surface NWNE / 330 FNL / 2185 FEL / LAT 32.1801611 / LONG -103.7641793 At proposed prod. zone SWSE / 200 FSL / 2310 FEL / LAT 32.1527919 / LONG -103.7646766		10. Field and Pool, or Exploratory PADUCA / BONE SPRING
14. Distance in miles and direction from nearest town or post office*		11. Sec., T. R. M. or Blk. and Survey or Area SEC 34 / T24S / R31E / NMP
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any) 200 feet	16. No. of acres in lease 160	12. County or Parish EDDY
17. Spacing Unit dedicated to this well 320	13. State NM	
18. Distance from proposed location* to nearest well, drilling, completed, 390 feet applied for, on this lease, ft.	19. Proposed Depth 11179 feet / 21270 feet	20. BLM/BIA Bond No. on file FED: CO1104
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3489 feet	22. Approximate date work will start* 08/21/2018	23. Estimated duration 30 days

24. Attachments

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

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 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 required by the BLM. |

25. Signature (Electronic Submission)	Name (Printed/Typed) Linda Good / Ph: (405)552-6558	Date 09/07/2017
Title Regulatory Compliance Professional		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 01/25/2018
Title Supervisor Multiple Resources		
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.

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS
Approval Date: 01/25/2018

RVP. 2-2-2018

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.

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 collects this information to allow 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 Collection 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: NWNE / 330 FNL / 2185 FEL / TWSP: 24S / RANGE: 31E / SECTION: 34 / LAT: 32.1801611 / LONG: -103.7641793 (TVD: 0 feet, MD: 0 feet)
PPP: NWNE / 200 FNL / 2286 FEL / TWSP: 24S / RANGE: 31E / SECTION: 3 / LAT: 32.1595 / LONG: -103.764677 (TVD: 11681 feet, MD: 16600 feet)
PPP: SWSE / 1050 FSL / 2286 FEL / TWSP: 24S / RANGE: 31E / SECTION: 34 / LAT: 32.166755 / LONG: -103.764653 (TVD: 11673 feet, MD: 15400 feet)
PPP: NWNE / 330 FNL / 2286 FEL / TWSP: 24S / RANGE: 31E / SECTION: 34 / LAT: 31.1801611 / LONG: -103.7641793 (TVD: 11578 feet, MD: 11700 feet)
BHL: SWSE / 200 FSL / 2310 FEL / TWSP: 25S / RANGE: 31E / SECTION: 3 / LAT: 32.1527919 / LONG: -103.7646766 (TVD: 11179 feet, MD: 21270 feet)

BLM Point of Contact

Name: Priscilla Perez

Title: Legal Instruments Examiner

Phone: 5752345934

Email: pperez@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.

COPIED FOR REVIEW

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Devon Energy Production Company, L.P.
LEASE NO.:	NMNM-89055
WELL NAME & NO.:	Cotton Draw Unit 518H
SURFACE HOLE FOOTAGE:	0485' FNL & 0410' FEL
BOTTOM HOLE FOOTAGE	0200' FSL & 0330' FEL Sec. 03, T. 25 S., R 31 E.
LOCATION:	Section 34, T. 24 S., R 31 E., NMPM
COUNTY:	County, New Mexico

Commercial Well Determination

A commercial well determination shall be submitted after production has been established for at least six months.

Unit Wells

The well sign for a unit well shall include the unit number in addition to the surface and bottom hole lease numbers. This also applies to participating area numbers. If a participating area has not been established, the operator can use the general unit designation, but will replace the unit number with the participating area number when the sign is replaced.

I. DRILLING

A. DRILLING OPERATIONS 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)

☐ **Eddy County**

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

1. **Although Hydrogen Sulfide has not been reported in the area, it is always a potential hazard. If Hydrogen Sulfide is encountered, report measured amounts and formations to the BLM. Operator has stated that they will have monitoring equipment in place prior to drilling out of the surface shoe.**
2. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**

3. Option – Setting surface casing with Surface Rig
 - a. Notify the BLM when removing the Surface Services Rig.
 - b. Notify the BLM when moving in the H&P Flex Rig. Rig to be moved in within 60 days of notification that Ashton Oilfield Services Rig has left the location. Failure to notify or have rig on location within 60 days will result in an Incident of Non-Compliance.
 - c. Once the H&P Flex Rig is on location, it shall not be removed from over the hole without prior approval unless the production casing has been run and cemented or the well has been properly plugged. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a “Major” violation.**
 - d. BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as H&P Flex Rig is rigged up on well. CIT for the surface casing shall be performed and results recorded on subsequent sundry – pressure to be 1200 psi.
4. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works is located, this does not include the dog house or stairway area.
5. **The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.**

B. CASING

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

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

Wait on cement (WOC) 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.

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.

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

Possibility of water flows in the Salado and Castile.

Possibility of lost circulation in the Red Beds, Rustler, and Delaware.

1. The 13-3/8 inch surface casing shall be set at approximately 725 feet (**in a competent bed below the Magenta Dolomite, which is a Member of the Rustler, and if salt is encountered, set casing at least 25 feet 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 is to include the lead cement slurry.**
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.

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

Intermediate casing shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.

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

- ☐ Cement to surface. If cement does not circulate see B.1.a, c-d above. Excess calculates to 24% - Additional cement may be required.

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

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

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.

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

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. Variance approved to use flex line from BOP to choke manifold. 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.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

If multibowl wellhead is used:

3. 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 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. Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.
 - 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.

5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

If non multibowl well head is used:

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be psi.

5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

5. The appropriate BLM office shall be notified a minimum of 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).

- a. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.
- b. 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.
- c. The results of the test shall be reported to the appropriate BLM office.
- d. 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.**
- e. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

D. DRILL STEM TEST

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

E. WASTE MATERIAL AND FLUIDS

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

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

JAM 011318

**PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	DEVON ENERGY PRODUCTION
LEASE NO.:	NMNM037489
WELL NAME & NO.:	518H – COTTON DRAW UNIT
SURFACE HOLE FOOTAGE:	330'/N & 2185'/E
BOTTOM HOLE FOOTAGE:	200'/S & 2310'/E
LOCATION:	Section 34., T24S., R.31E., NMP
COUNTY:	EDDY County, New Mexico

TABLE OF CONTENTS

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

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
- ☐ **Noxious Weeds**
- ☒ **Special Requirements**
 - Lesser Prairie-Chicken Timing Stipulations
 - Ground-level Abandoned Well Marker
 - Range
- ☐ **Construction**
 - Notification
 - Topsoil
 - Closed Loop System
 - Federal Mineral Material Pits
 - Well Pads
 - Roads
- ☐ **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)

This is a build as you go pad, no grading all at once.

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.

Devon must contact the allotment holder prior to construction to identify the location of the pipeline. Devon must take measures to protect the pipeline from compression or other damages. If the pipeline is damaged or compromised in any way near the proposed project as a result of oil and gas activity, Devon is responsible for repairing the pipeline 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.

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

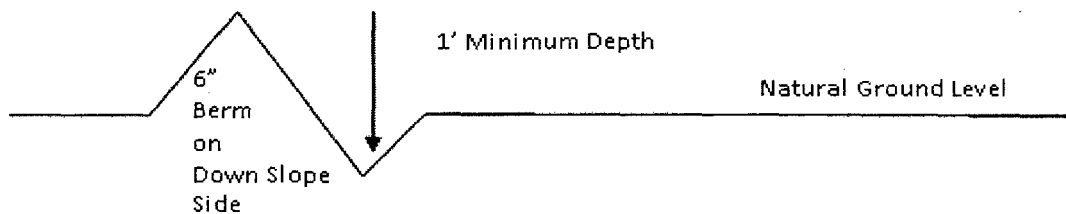
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

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

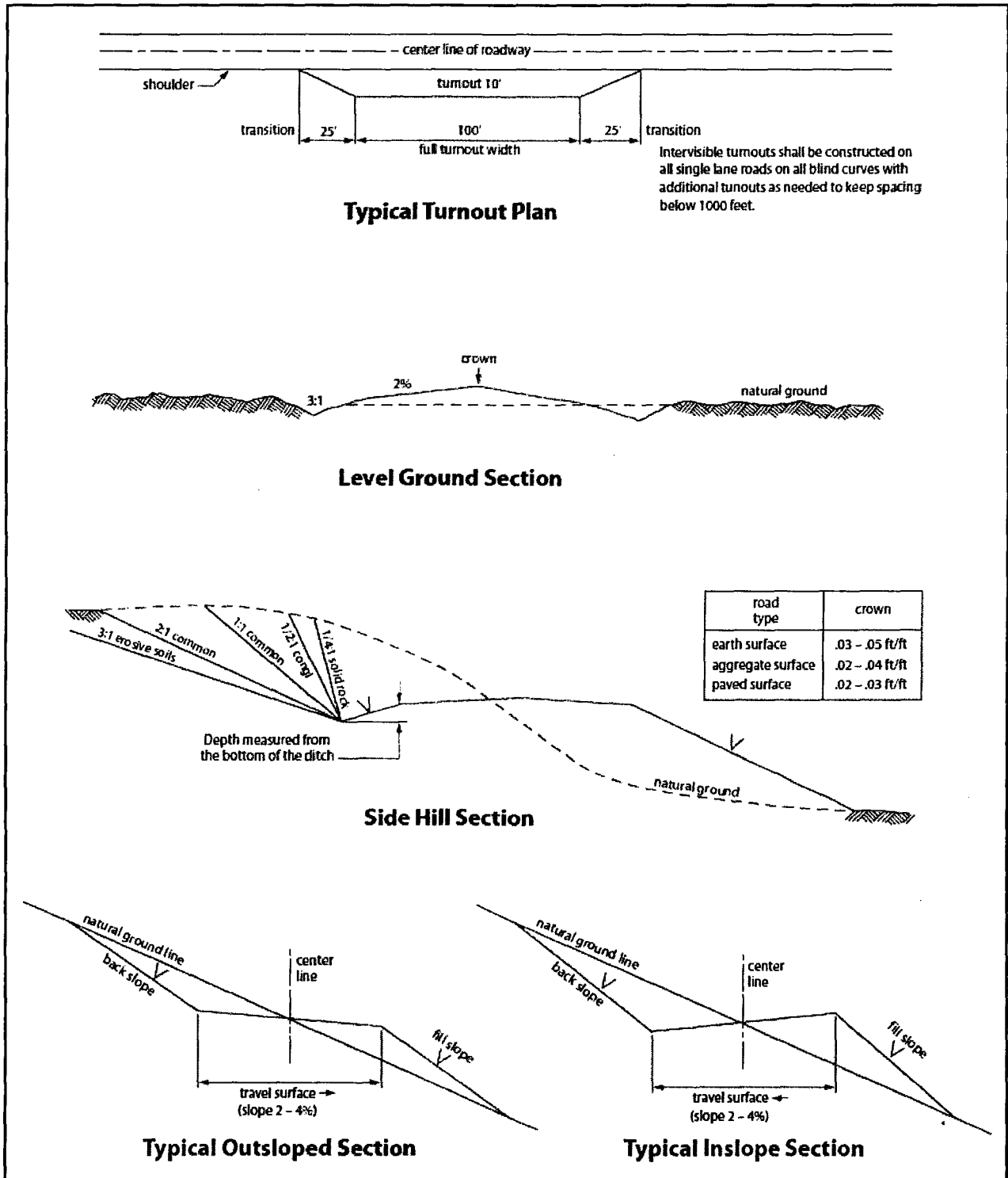


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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).

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.

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 deterrence 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

**PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	DEVON ENERGY PRODUCTION
LEASE NO.:	NMNM037489
WELL NAME & NO.:	518H – COTTON DRAW UNIT
SURFACE HOLE FOOTAGE:	330'/N & 2185'/E
BOTTOM HOLE FOOTAGE	200'/S & 2310'/E
LOCATION:	Section 34., T24S., R.31E., NMP
COUNTY:	EDDY County, New Mexico

TABLE OF CONTENTS

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

- ☐ **General Provisions**
- ☐ **Permit Expiration**
- ☐ **Archaeology, Paleontology, and Historical Sites**
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- ☐ **Construction**
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- ☐ **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)

This is a build as you go pad, no grading all at once.

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.

Devon must contact the allotment holder prior to construction to identify the location of the pipeline. Devon must take measures to protect the pipeline from compression or other damages. If the pipeline is damaged or compromised in any way near the proposed project as a result of oil and gas activity, Devon is responsible for repairing the pipeline 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.

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

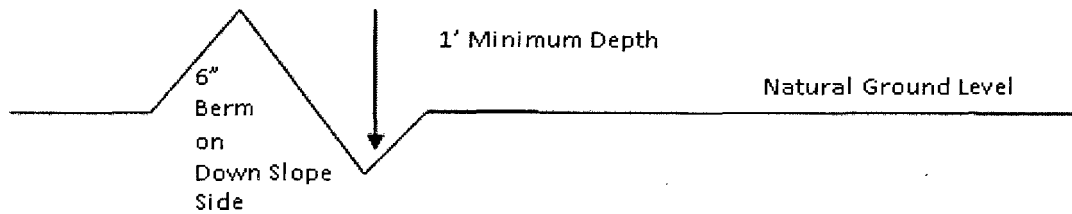
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

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

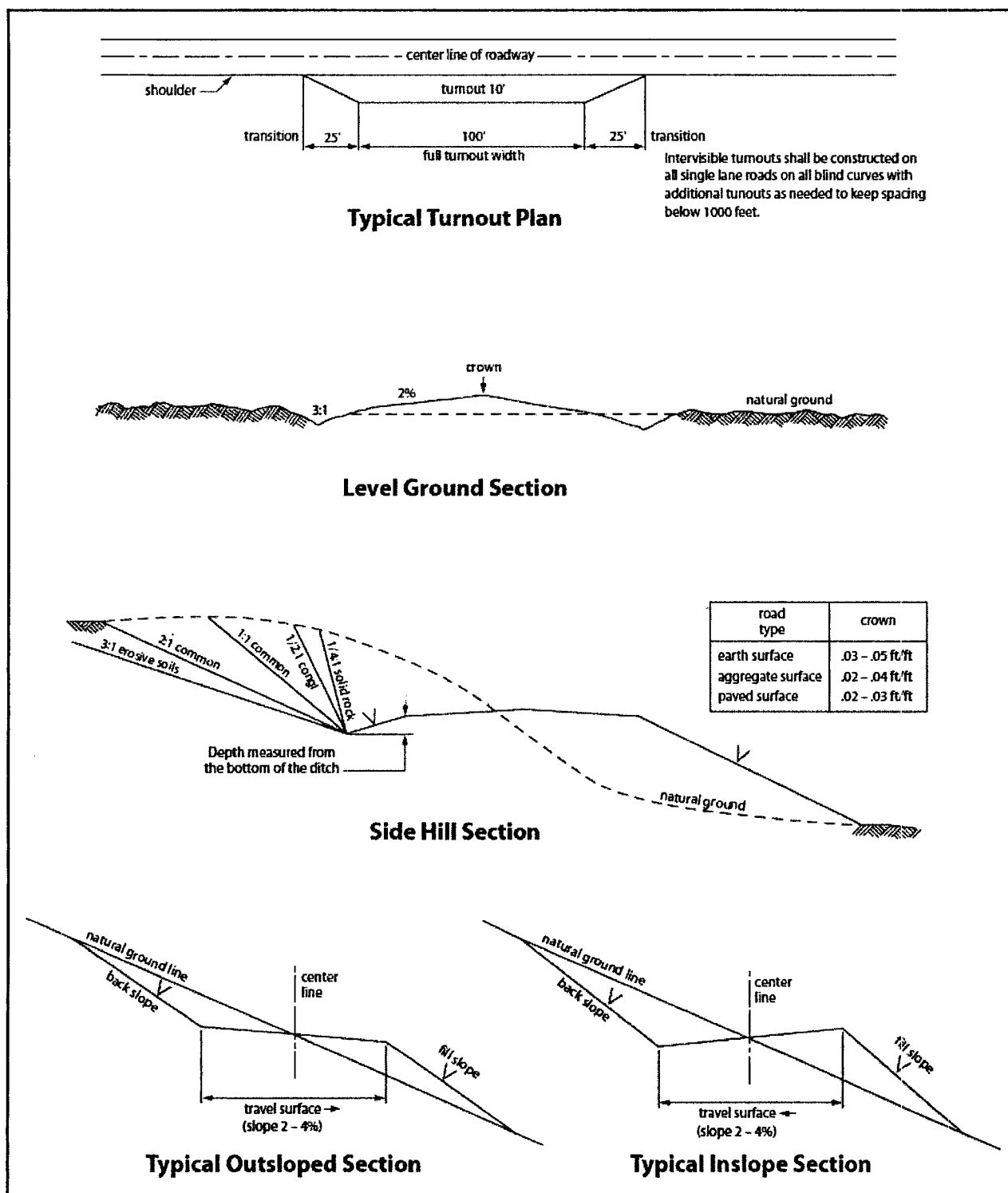


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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).

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.

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 deterrence 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	11lbs/A

*Pounds of pure live seed:

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



**U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT**

Operator Certification Data Report

01/25/2018

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: Linda Good

Signed on: 09/07/2017

Title: Regulatory Compliance Professional

Street Address: 333 West Sheridan Avenue

City: Oklahoma City

State: OK

Zip: 73102

Phone: (405)552-6558

Email address: Linda.Good@dvn.com

Field Representative

Representative Name: Ray Vaz

Street Address: 6488 Seven Rivers Hwy

City: Artesia

State: NM

Zip: 88210

Phone: (575)748-1871

Email address: ray.vaz@dvn.com



U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Application Data Report

01/25/2018

APD ID: 10400017586

Submission Date: 09/07/2017

Highlighted data
reflects the most
recent changes

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - General

APD ID: 10400017586

Tie to previous NOS? 10400015532

Submission Date: 09/07/2017

BLM Office: CARLSBAD

User: Linda Good

Title: Regulatory Compliance
Professional

Federal/Indian APD: FED

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

Lease number: NMNM037489

Lease Acres: 160

Surface access agreement in place?

Allotted?

Reservation:

Agreement in place? YES

Federal or Indian agreement: FEDERAL

Agreement number: NMNM70928X

Agreement name: COTTON DRAW

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: (405)552-6571

Operator Internet Address: aletha.dewbre@dvn.com

Section 2 - Well Information

Well in Master Development Plan? NO

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: COTTON DRAW UNIT

Well Number: 518H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: PADUCA

Pool Name: BONE SPRING

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

Describe other minerals:

Is the proposed well in a Helium production area? N Use Existing Well Pad? NO New surface disturbance?

Type of Well Pad: SINGLE WELL

Multiple Well Pad Name:

Number:

Well Class: HORIZONTAL

Number of Legs: 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: APPRAISAL

Describe sub-type:

Distance to town:

Distance to nearest well: 390 FT

Distance to lease line: 200 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: CDU_518H_C_102_signed_with_FTP_08-14-2017.pdf

Well work start Date: 08/21/2018

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number: 5336A

	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	330	FNL	218 5	FEL	24S	31E	34	Aliquot NWNE	32.18016 11	- 103.7641 793	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 037489	348 9	0	0
KOP Leg #1	279	FNL	228 6	FEL	24S	31E	34	Aliquot NWNE	32.18016 11	- 103.7641 793	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 037489	- 759 0	110 93	110 79
PPP Leg #1	330	FNL	228 6	FEL	24S	31E	34	Aliquot NWNE	31.18016 11	- 103.7641 793	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 037489	- 808 9	117 00	115 78

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

	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	105 0	FSL	228 6	FEL	24S	31E	34	Aliquot SWSE	32.16675 5	- 103.7646 53	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 036379	- 818 4	154 00	116 73
PPP Leg #1	200	FNL	228 6	FEL	24S	31E	3	Aliquot NWNE	32.1595	- 103.7646 77	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 042625	- 819 2	166 00	116 81
EXIT Leg #1	200	FSL	231 0	FEL	25S	31E	3	Aliquot SWSE	32.15279 19	- 103.7646 766	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 046525	- 769 0	212 70	111 79
BHL Leg #1	200	FSL	231 0	FEL	25S	31E	3	Aliquot SWSE	32.15279 19	- 103.7646 766	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 046525	- 769 0	212 70	111 79

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

Pressure Rating (PSI): 5M

Rating Depth: 11714

Equipment: BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M 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:

CDU_518H_5M_BOPE_Ck_20170907131314.pdf

BOP Diagram Attachment:

CDU_518H_5M_BOPE_Ck_20170907131346.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	725	0	725			725	H-40	48	STC	1.74	2.45	BUOY	4.13	BUOY	4.13
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4350	0	4350			4350	J-55	40	LTC	1.19	1.42	BUOY	3.98	BUOY	3.98
3	PRODUCTION	8.75	5.5	NEW	API	N	0	21656	0	11714			21656	P-110	17	BUTT	2.18	2.7	BUOY	3.21	BUOY	3.21

Casing Attachments

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

CDU_518H_SurfCsg_Ass_20170907133322.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

CDU_518H_Int_Csg_Ass_20170907133447.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

CDU_518H_ProdCasing_Ass_20170907133708.pdf

Section 4 - Cement

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	725	565	1.34	14.8	755	50	C	1% Calcium Chloride

INTERMEDIATE	Lead		0	3350	737	1.85	12.9	1363	30	C	Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sks Poly-E-Flake
INTERMEDIATE	Tail		3350	4350	306	1.33	14.8	407	30	C	0.125 lbs/sks Poly-R- Flake
PRODUCTION	Lead		4350	1155 0	715	3.27	9	2336	25	TUNED	N/A
PRODUCTION	Tail		1155 0	2165 6	2659	1.2	14.5	3190	25	H	Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite

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
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Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

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
725	4350	OTHER : SATURATED BRINE	10	10.2							
0	725	OTHER : FRESH WATER GEL	8.6	8.8							
4350	21656	OTHER : CUT BRINE	8.5	9.3							

Section 6 - Test, Logging, Coring

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

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.

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

CBL,DS,MUDLOG

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5857

Anticipated Surface Pressure: 3287.18

Anticipated Bottom Hole Temperature(F): 170

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:

CDU_518H_H2S_Plan_20170907134946.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

CDU_518H_Dir_Plan_20170907135030.pdf

CDU_518H_Well_Plan_20170907135043.pdf

CDU_518H_Anticollison_20170907135055.pdf

Other proposed operations facets description:

Drilling Plan

Closed Loop System

Multi-Bowl Verbiage

Multi-Bowl Wellhead

Other proposed operations facets attachment:

CDU_518H_Drilling_Plan_20170907135133.pdf

CDU_518H_Clsd_Loop_20170907135147.pdf

CDU_518H_MB_Verb_20170907135215.pdf

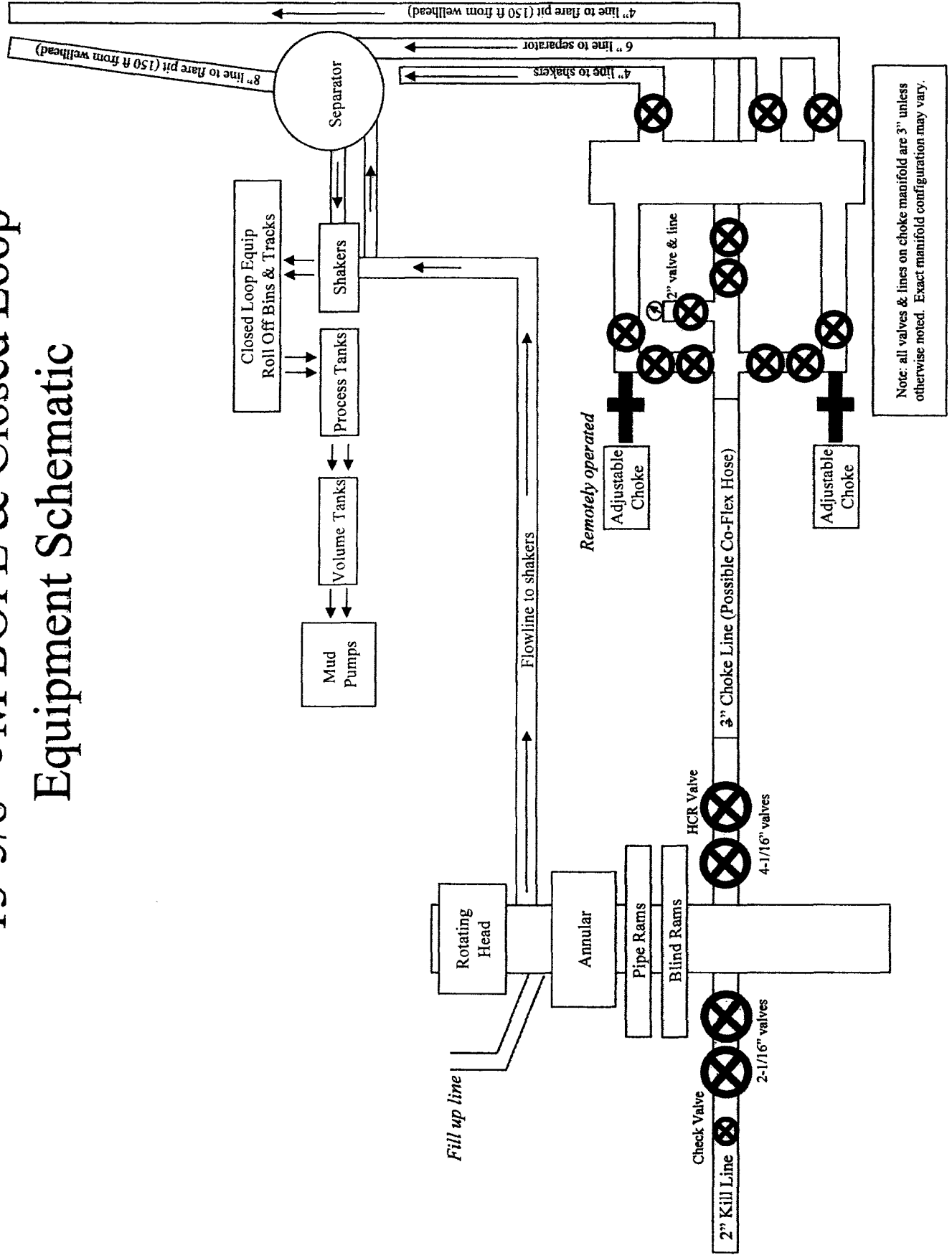
CDU_518H_MB_WellHd_20170907135228.pdf

Other Variance attachment:

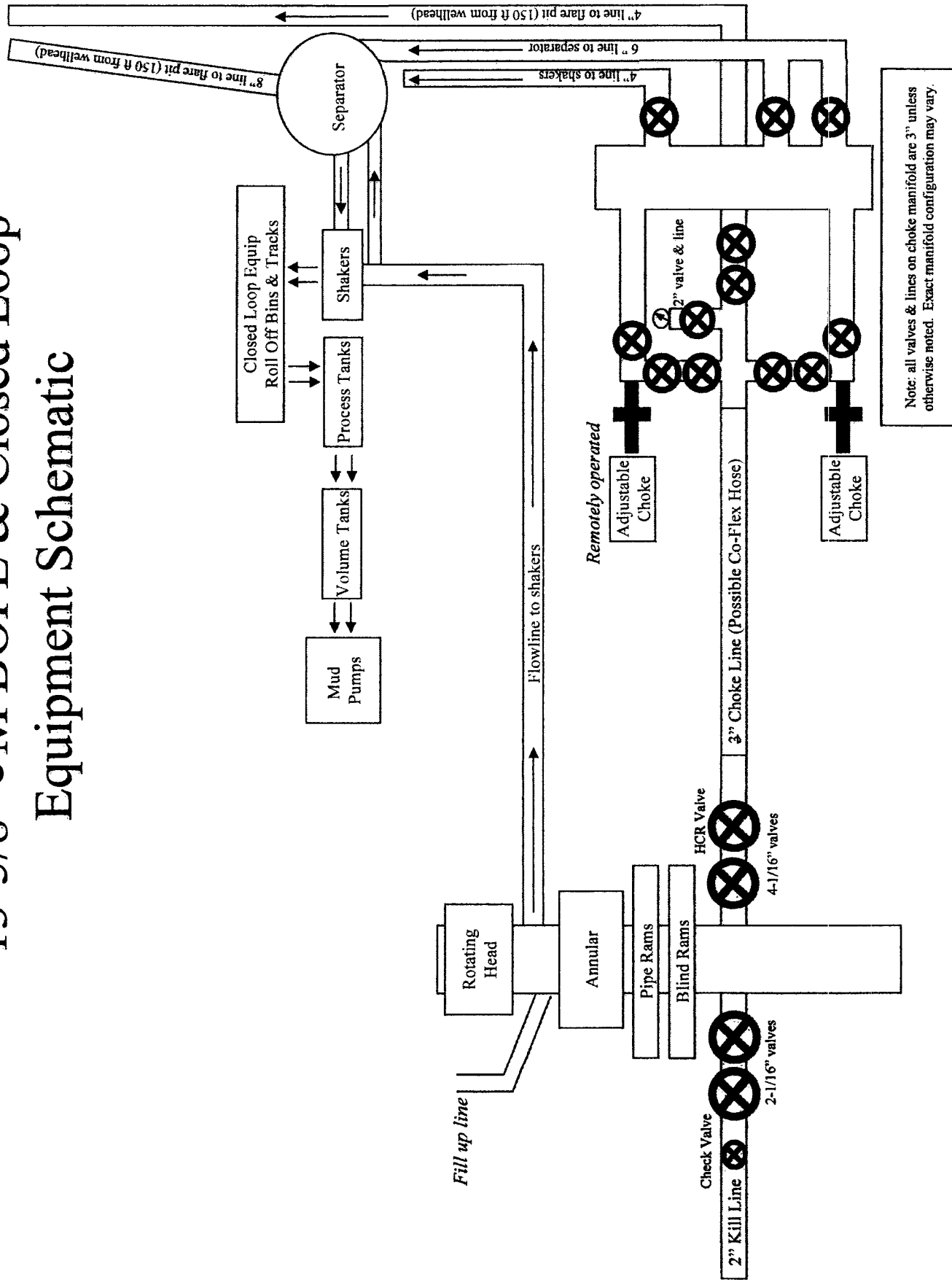
CDU_518H_Co_flex_20170907135246.pdf

CDU_518H_Spudder_Rig_20170907135302.pdf

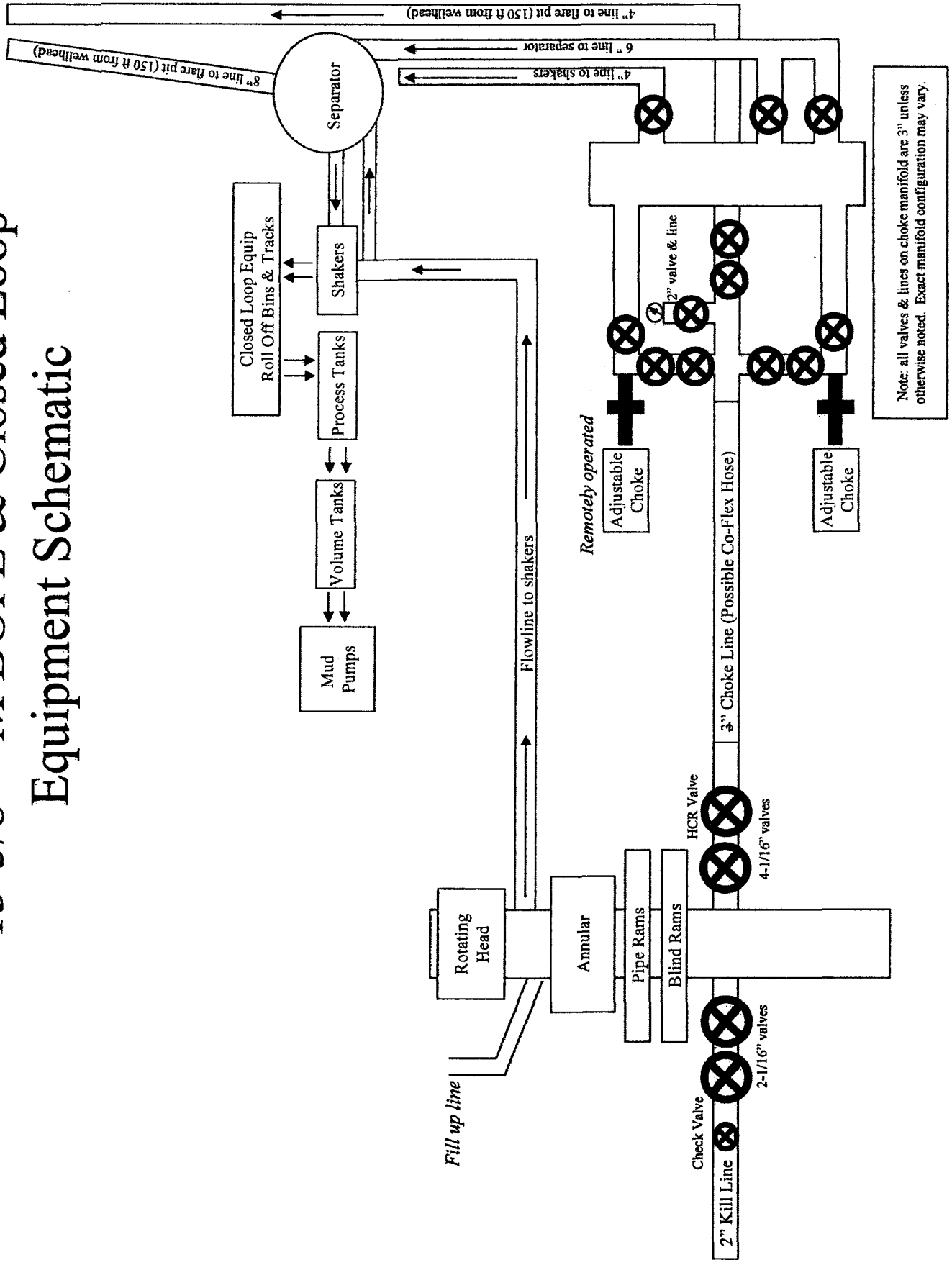
13-5/8" 5M BOPE & Closed Loop Equipment Schematic



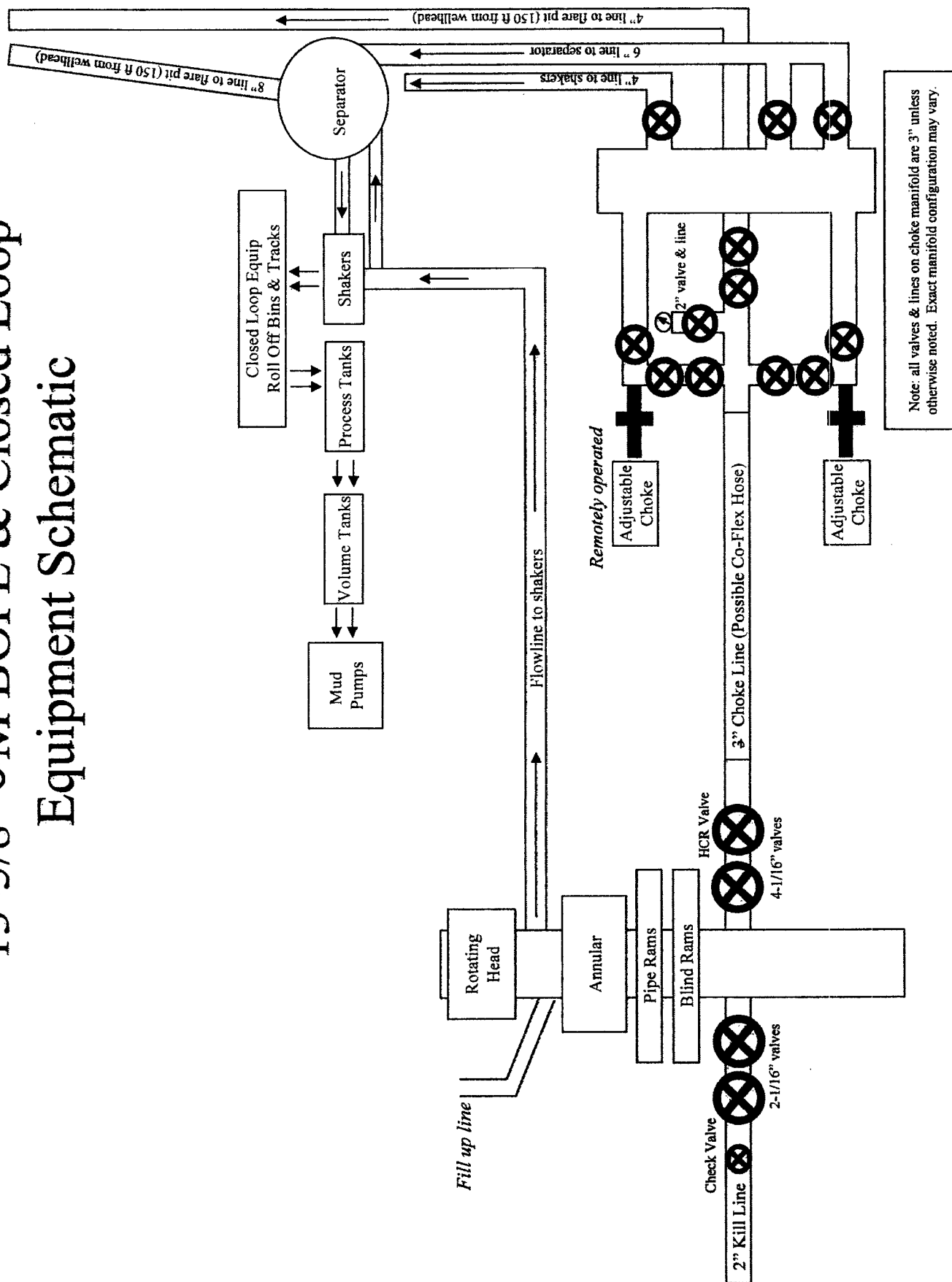
13-5/8" 5M BOPE & Closed Loop Equipment Schematic



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



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



Casing Assumptions and Load Cases

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

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

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



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

Hydrogen Sulfide (H₂S) Contingency Plan

For

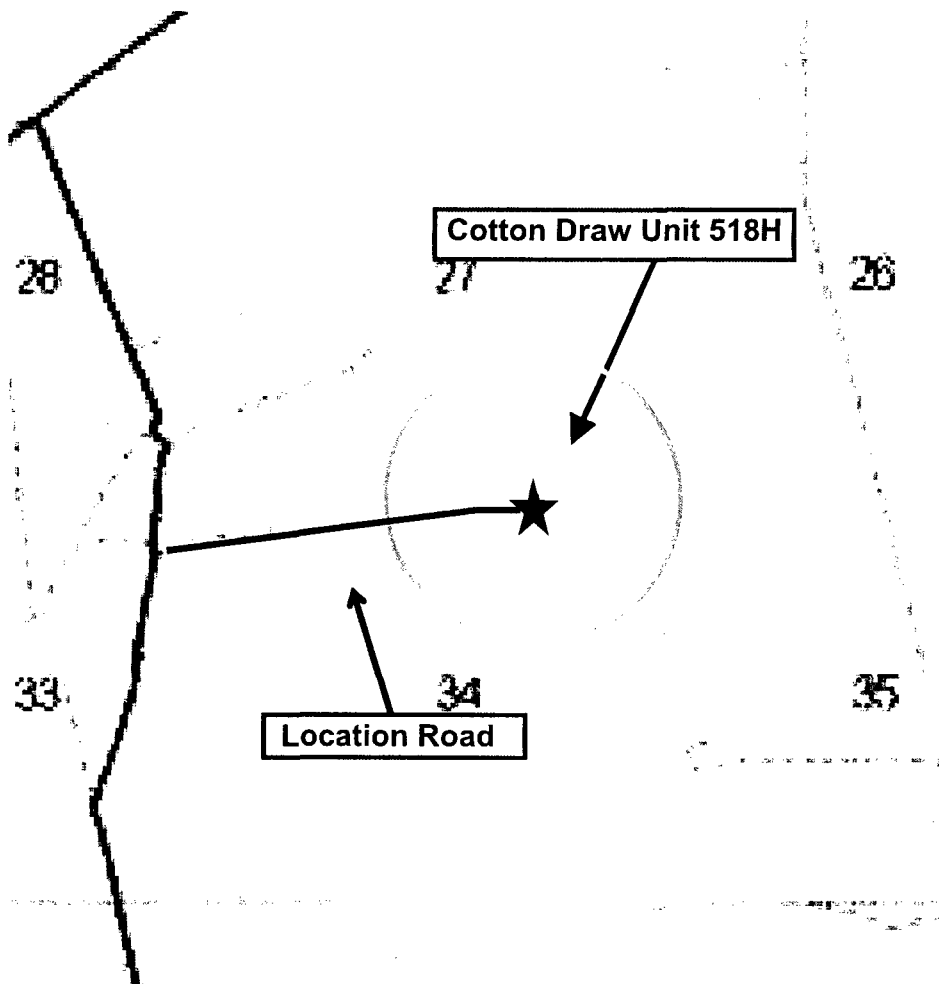
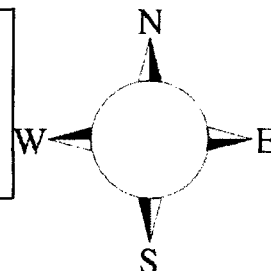
Cotton Draw Unit 518H

**Sec-34 T-24S R-31E
330' FNL & 2185 FEL
LAT. = 32.1801611' N (NAD83)
LONG = 103.7641793 W**

Eddy County NM

Cotton Draw Unit 518H

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 one escape unit 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 10 ppm. Sensor locations:

- Bell nipple
- Shale shaker
- Trip tank
- Suction pit
- Rig floor
- Cellar
- Choke manifold
- Living Quarters (usually the company man's trailer stairs.)

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. There will be no drill stem testing.

<u>Devon Energy Corp. Company Call List</u>		
Drilling Supervisor – Basin – Mark Kramer		405-823-4796
Jerry Matthews – Day: 575-748-0161 Cell: 575-748-5234		
EHS Professional – Jason Robison		405-541-2841
<u>Agency Call List</u>		
<u>Lea County (575)</u>	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
<u>Eddy County (575)</u>	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
	Native Air – Emergency Helicopter – Hobbs	(575) 392-6429
	Flight For Life - Lubbock, TX	(806) 743-9911
<u>Give GPS position:</u>	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





Company: Devon Energy
Site: Cotton Draw Unit
Well: 518H
Project: Eddy County, New Mexico (NAD 83)
Rig: Cactus 126



ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation
5000.00	0.00	0.00	5000.00	0.00	0.00	0.00	0.00	KOP, 1.00"/100' Build
5600.13	6.00	340.08	5599.03	29.52	-10.70	-29.52	31.40	Begin 6.00" Tangent
7841.35	6.00	340.08	7827.97	249.82	-90.55	-249.82	265.72	Begin 1.00"/100' Drop
8441.48	0.00	0.00	8427.00	279.34	-101.25	-279.34	297.12	Begin Vertical Hold
11092.52	0.00	0.00	11078.05	279.34	-101.25	-279.34	297.12	Begin 10.00"/100' Build
11988.78	89.63	180.00	11650.99	-289.88	-101.25	289.88	866.34	Begin 89.63° Lateral
21656.46	89.63	180.00	11714.10	-9957.35	-101.25	9957.35	10533.81	PBHL

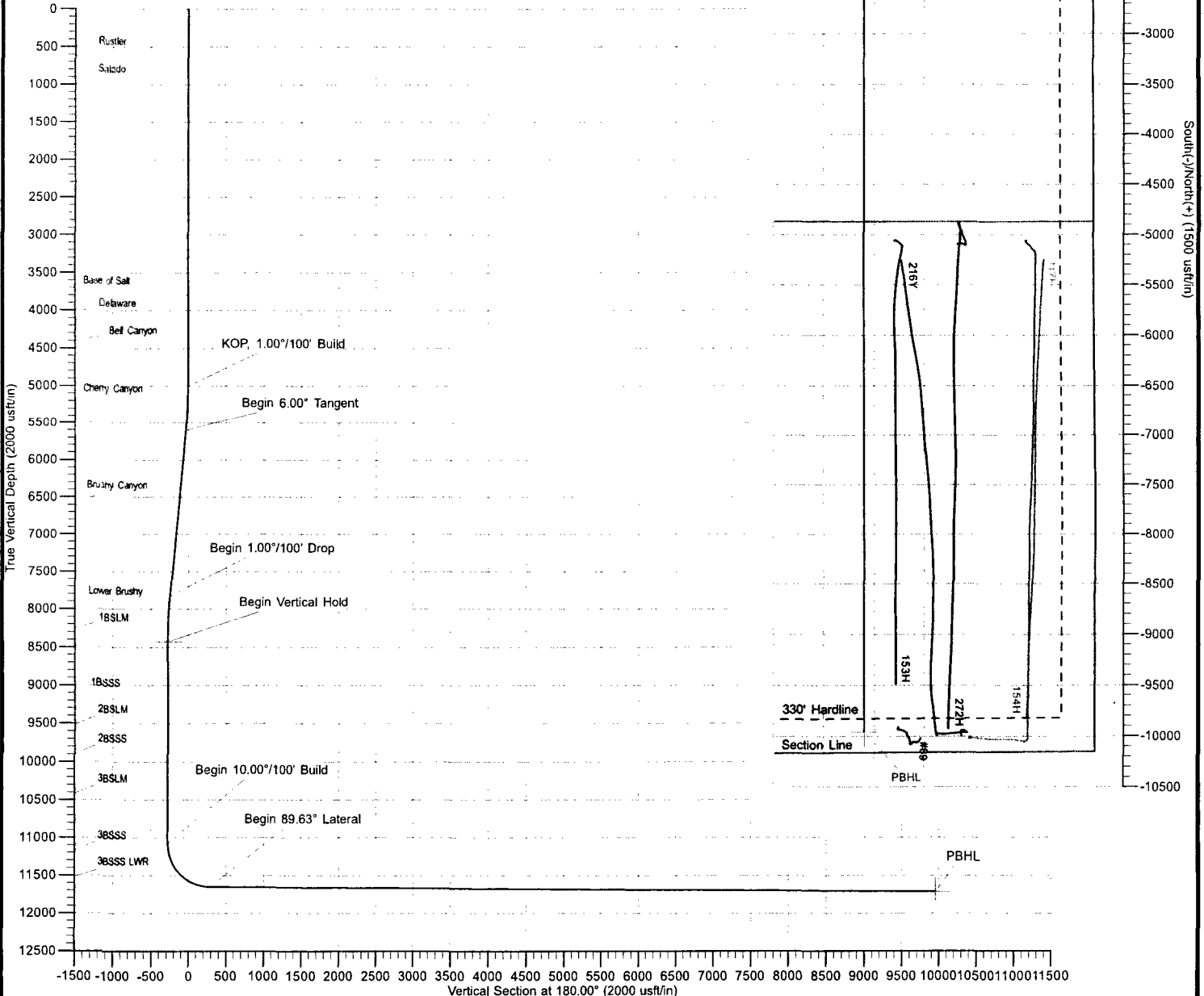


Azimuths to Grid North
True North: -0.30°
Magnetic North: 6.79°

Magnetic Field
Strength: 47921.2snT
Dip Angle: 59.96°
Date: 8/31/2017
Model: BGGM2017

US State Plane 1983
New Mexico Eastern Zone

Created By: KAW
Date: 11:08, August 31 2017
Plan: Design #1



The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented.

Any decisions made or wells drilled utilizing this or any other information supplied by MS Energy are at the sole risk and responsibility of the customer. MS Energy is not responsible for the accuracy of this schematic or the information contained herein.



Devon Energy

**Eddy County, New Mexico (NAD 83)
Cotton Draw Unit
518H**

Wellbore #1

Plan: Design #1

Standard Planning Report

31 August, 2017



MS Energy Services
Planning Report



Database: EDM 5000.14 Conroe Server
Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Site: Cotton Draw Unit
Well: 518H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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

Well	518H				
Well Position	+N/-S	429,743.12 usft	Northing:	429,743.12 usft	Latitude: 32° 10' 48.580 N
	+E/-W	717,423.87 usft	Easting:	717,423.87 usft	Longitude: 103° 45' 51.045 W
Position Uncertainty	0.00 usft		Wellhead Elevation:		Ground Level: 3,489.10 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2017	8/31/2017	7.09	59.96	47,921

Design Design #1

Audit Notes:

Version: **Phase:** PROTOTYPE **Tie On Depth:** 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	180.00

Plan Survey Tool Program **Date** 8/31/2017

Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	21,656.46	Design #1 (Wellbore #1)	MWD OWSG MWD - Standard

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
5,600.13	6.00	340.08	5,599.03	29.52	-10.70	1.00	1.00	0.00	340.08	
7,841.35	6.00	340.08	7,827.97	249.82	-90.55	0.00	0.00	0.00	0.00	
8,441.48	0.00	0.00	8,427.00	279.34	-101.25	1.00	-1.00	0.00	180.00	Vert - CDU 518H
11,092.52	0.00	0.00	11,078.05	279.34	-101.25	0.00	0.00	0.00	0.00	
11,988.78	89.63	180.00	11,650.99	-289.88	-101.25	10.00	10.00	0.00	180.00	
21,656.46	89.63	180.00	11,714.10	-9,957.35	-101.25	0.00	0.00	0.00	0.00	PBHL - CDU 518H



MS Energy Services
Planning Report



Database: EDM 5000.14 Conroe Server
Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Site: Cotton Draw Unit
Well: 518H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
636.10	0.00	0.00	636.10	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,005.10	0.00	0.00	1,005.10	0.00	0.00	0.00	0.00	0.00	0.00
Salado									
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	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
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,164.10	0.00	0.00	4,164.10	0.00	0.00	0.00	0.00	0.00	0.00
Base of Salt									
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,374.10	0.00	0.00	4,374.10	0.00	0.00	0.00	0.00	0.00	0.00
Delaware									
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,409.10	0.00	0.00	4,409.10	0.00	0.00	0.00	0.00	0.00	0.00



MS Energy Services
Planning Report



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Project: Eddy County, New Mexico (NAD 83)
Site: Cotton Draw Unit
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Wellbore: Wellbore #1
Design: Design #1

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North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
Bell Canyon									
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, 1.00°/100' Build									
5,100.00	1.00	340.08	5,100.00	0.82	-0.30	-0.82	1.00	1.00	0.00
5,200.00	2.00	340.08	5,199.96	3.28	-1.19	-3.28	1.00	1.00	0.00
5,300.00	3.00	340.08	5,299.86	7.38	-2.68	-7.38	1.00	1.00	0.00
5,349.25	3.49	340.08	5,349.04	10.00	-3.63	-10.00	1.00	1.00	0.00
Cherry Canyon									
5,400.00	4.00	340.08	5,399.68	13.12	-4.76	-13.12	1.00	1.00	0.00
5,500.00	5.00	340.08	5,499.37	20.50	-7.43	-20.50	1.00	1.00	0.00
5,600.13	6.00	340.08	5,599.03	29.52	-10.70	-29.52	1.00	1.00	0.00
Begin 6.00° Tangent									
5,700.00	6.00	340.08	5,698.36	39.34	-14.26	-39.34	0.00	0.00	0.00
5,800.00	6.00	340.08	5,797.81	49.17	-17.82	-49.17	0.00	0.00	0.00
5,900.00	6.00	340.08	5,897.26	59.00	-21.38	-59.00	0.00	0.00	0.00
6,000.00	6.00	340.08	5,996.71	68.83	-24.95	-68.83	0.00	0.00	0.00
6,100.00	6.00	340.08	6,096.16	78.65	-28.51	-78.65	0.00	0.00	0.00
6,200.00	6.00	340.08	6,195.62	88.48	-32.07	-88.48	0.00	0.00	0.00
6,300.00	6.00	340.08	6,295.07	98.31	-35.64	-98.31	0.00	0.00	0.00
6,400.00	6.00	340.08	6,394.52	108.14	-39.20	-108.14	0.00	0.00	0.00
6,500.00	6.00	340.08	6,493.97	117.97	-42.76	-117.97	0.00	0.00	0.00
6,600.00	6.00	340.08	6,593.42	127.80	-46.32	-127.80	0.00	0.00	0.00
6,635.02	6.00	340.08	6,628.25	131.24	-47.57	-131.24	0.00	0.00	0.00
Brushy Canyon									
6,700.00	6.00	340.08	6,692.88	137.63	-49.89	-137.63	0.00	0.00	0.00
6,800.00	6.00	340.08	6,792.33	147.46	-53.45	-147.46	0.00	0.00	0.00
6,900.00	6.00	340.08	6,891.78	157.29	-57.01	-157.29	0.00	0.00	0.00
7,000.00	6.00	340.08	6,991.23	167.12	-60.57	-167.12	0.00	0.00	0.00
7,100.00	6.00	340.08	7,090.68	176.95	-64.14	-176.95	0.00	0.00	0.00
7,200.00	6.00	340.08	7,190.14	186.78	-67.70	-186.78	0.00	0.00	0.00
7,300.00	6.00	340.08	7,289.59	196.61	-71.26	-196.61	0.00	0.00	0.00
7,400.00	6.00	340.08	7,389.04	206.44	-74.83	-206.44	0.00	0.00	0.00
7,500.00	6.00	340.08	7,488.49	216.26	-78.39	-216.26	0.00	0.00	0.00
7,600.00	6.00	340.08	7,587.94	226.09	-81.95	-226.09	0.00	0.00	0.00
7,700.00	6.00	340.08	7,687.40	235.92	-85.51	-235.92	0.00	0.00	0.00
7,800.00	6.00	340.08	7,786.85	245.75	-89.08	-245.75	0.00	0.00	0.00
7,841.35	6.00	340.08	7,827.97	249.82	-90.55	-249.82	0.00	0.00	0.00
Begin 1.00°/100' Drop									
7,900.00	5.41	340.08	7,886.33	255.30	-92.54	-255.30	1.00	-1.00	0.00
8,000.00	4.41	340.08	7,985.96	263.36	-95.46	-263.36	1.00	-1.00	0.00
8,001.44	4.40	340.08	7,987.40	263.46	-95.49	-263.46	1.00	-1.00	0.00
Lower Brushy									
8,100.00	3.41	340.08	8,085.73	269.77	-97.78	-269.77	1.00	-1.00	0.00
8,200.00	2.41	340.08	8,185.60	274.55	-99.52	-274.55	1.00	-1.00	0.00
8,271.76	1.70	340.08	8,257.31	276.98	-100.39	-276.98	1.00	-1.00	0.00
1BSLM									
8,300.00	1.41	340.08	8,285.54	277.70	-100.65	-277.70	1.00	-1.00	0.00
8,400.00	0.41	340.08	8,385.52	279.20	-101.20	-279.20	1.00	-1.00	0.00



MS Energy Services
Planning Report



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Site: Cotton Draw Unit
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Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,441.48	0.00	0.00	8,427.00	279.34	-101.25	-279.34	1.00	-1.00	0.00
Begin Vertical Hold									
8,500.00	0.00	0.00	8,485.52	279.34	-101.25	-279.34	0.00	0.00	0.00
8,600.00	0.00	0.00	8,585.52	279.34	-101.25	-279.34	0.00	0.00	0.00
8,700.00	0.00	0.00	8,685.52	279.34	-101.25	-279.34	0.00	0.00	0.00
8,800.00	0.00	0.00	8,785.52	279.34	-101.25	-279.34	0.00	0.00	0.00
8,900.00	0.00	0.00	8,885.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,000.00	0.00	0.00	8,985.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,100.00	0.00	0.00	9,085.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,200.00	0.00	0.00	9,185.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,300.00	0.00	0.00	9,285.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,316.77	0.00	0.00	9,302.30	279.34	-101.25	-279.34	0.00	0.00	0.00
1BSST									
9,400.00	0.00	0.00	9,385.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,500.00	0.00	0.00	9,485.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,536.77	0.00	0.00	9,522.30	279.34	-101.25	-279.34	0.00	0.00	0.00
2BSLM									
9,600.00	0.00	0.00	9,585.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,700.00	0.00	0.00	9,685.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,800.00	0.00	0.00	9,785.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,900.00	0.00	0.00	9,885.52	279.34	-101.25	-279.34	0.00	0.00	0.00
9,921.77	0.00	0.00	9,907.30	279.34	-101.25	-279.34	0.00	0.00	0.00
2BSST									
10,000.00	0.00	0.00	9,985.52	279.34	-101.25	-279.34	0.00	0.00	0.00
10,100.00	0.00	0.00	10,085.52	279.34	-101.25	-279.34	0.00	0.00	0.00
10,200.00	0.00	0.00	10,185.52	279.34	-101.25	-279.34	0.00	0.00	0.00
10,300.00	0.00	0.00	10,285.52	279.34	-101.25	-279.34	0.00	0.00	0.00
10,400.00	0.00	0.00	10,385.52	279.34	-101.25	-279.34	0.00	0.00	0.00
10,441.77	0.00	0.00	10,427.30	279.34	-101.25	-279.34	0.00	0.00	0.00
3BSLM									
10,500.00	0.00	0.00	10,485.52	279.34	-101.25	-279.34	0.00	0.00	0.00
10,600.00	0.00	0.00	10,585.52	279.34	-101.25	-279.34	0.00	0.00	0.00
10,700.00	0.00	0.00	10,685.52	279.34	-101.25	-279.34	0.00	0.00	0.00
10,800.00	0.00	0.00	10,785.52	279.34	-101.25	-279.34	0.00	0.00	0.00
10,900.00	0.00	0.00	10,885.52	279.34	-101.25	-279.34	0.00	0.00	0.00
11,000.00	0.00	0.00	10,985.52	279.34	-101.25	-279.34	0.00	0.00	0.00
11,092.52	0.00	0.00	11,078.05	279.34	-101.25	-279.34	0.00	0.00	0.00
Begin 10.00°/100' Build									
11,100.00	0.75	180.00	11,085.52	279.29	-101.25	-279.29	10.00	10.00	0.00
11,150.00	5.75	180.00	11,135.43	276.46	-101.25	-276.46	10.00	10.00	0.00
11,192.33	9.98	180.00	11,177.35	270.67	-101.25	-270.67	10.00	10.00	0.00
3BSST									
11,200.00	10.75	180.00	11,184.89	269.29	-101.25	-269.29	10.00	10.00	0.00
11,250.00	15.75	180.00	11,233.55	257.83	-101.25	-257.83	10.00	10.00	0.00
11,300.00	20.75	180.00	11,281.02	242.18	-101.25	-242.18	10.00	10.00	0.00
11,350.00	25.75	180.00	11,326.95	222.45	-101.25	-222.45	10.00	10.00	0.00
11,400.00	30.75	180.00	11,370.98	198.80	-101.25	-198.80	10.00	10.00	0.00
11,450.00	35.75	180.00	11,412.78	171.39	-101.25	-171.39	10.00	10.00	0.00
11,500.00	40.75	180.00	11,452.03	140.45	-101.25	-140.45	10.00	10.00	0.00
11,550.00	45.75	180.00	11,488.44	106.20	-101.25	-106.20	10.00	10.00	0.00
11,600.00	50.75	180.00	11,521.73	68.91	-101.25	-68.91	10.00	10.00	0.00
11,611.17	51.87	180.00	11,528.71	60.19	-101.25	-60.19	10.00	10.00	0.00
3BSST LWR									



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Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,650.00	55.75	180.00	11,551.64	28.86	-101.25	-28.86	10.00	10.00	0.00
11,700.00	60.75	180.00	11,577.94	-13.64	-101.25	13.64	10.00	10.00	0.00
11,750.00	65.75	180.00	11,600.44	-58.27	-101.25	58.27	10.00	10.00	0.00
11,800.00	70.75	180.00	11,618.96	-104.70	-101.25	104.70	10.00	10.00	0.00
11,850.00	75.75	180.00	11,633.37	-152.56	-101.25	152.56	10.00	10.00	0.00
11,900.00	80.75	180.00	11,643.55	-201.50	-101.25	201.50	10.00	10.00	0.00
11,950.00	85.75	180.00	11,649.43	-251.14	-101.25	251.14	10.00	10.00	0.00
11,988.78	89.63	180.00	11,650.99	-289.88	-101.25	289.88	10.00	10.00	0.00
Begin 89.63° Lateral									
12,000.00	89.63	180.00	11,651.07	-301.10	-101.25	301.10	0.00	0.00	0.00
12,100.00	89.63	180.00	11,651.72	-401.09	-101.25	401.09	0.00	0.00	0.00
12,200.00	89.63	180.00	11,652.37	-501.09	-101.25	501.09	0.00	0.00	0.00
12,300.00	89.63	180.00	11,653.02	-601.09	-101.25	601.09	0.00	0.00	0.00
12,400.00	89.63	180.00	11,653.68	-701.09	-101.25	701.09	0.00	0.00	0.00
12,500.00	89.63	180.00	11,654.33	-801.09	-101.25	801.09	0.00	0.00	0.00
12,600.00	89.63	180.00	11,654.98	-901.08	-101.25	901.08	0.00	0.00	0.00
12,700.00	89.63	180.00	11,655.64	-1,001.08	-101.25	1,001.08	0.00	0.00	0.00
12,800.00	89.63	180.00	11,656.29	-1,101.08	-101.25	1,101.08	0.00	0.00	0.00
12,900.00	89.63	180.00	11,656.94	-1,201.08	-101.25	1,201.08	0.00	0.00	0.00
13,000.00	89.63	180.00	11,657.59	-1,301.08	-101.25	1,301.08	0.00	0.00	0.00
13,100.00	89.63	180.00	11,658.25	-1,401.07	-101.25	1,401.07	0.00	0.00	0.00
13,200.00	89.63	180.00	11,658.90	-1,501.07	-101.25	1,501.07	0.00	0.00	0.00
13,300.00	89.63	180.00	11,659.55	-1,601.07	-101.25	1,601.07	0.00	0.00	0.00
13,400.00	89.63	180.00	11,660.20	-1,701.07	-101.25	1,701.07	0.00	0.00	0.00
13,500.00	89.63	180.00	11,660.86	-1,801.06	-101.25	1,801.06	0.00	0.00	0.00
13,600.00	89.63	180.00	11,661.51	-1,901.06	-101.25	1,901.06	0.00	0.00	0.00
13,700.00	89.63	180.00	11,662.16	-2,001.06	-101.25	2,001.06	0.00	0.00	0.00
13,800.00	89.63	180.00	11,662.82	-2,101.06	-101.25	2,101.06	0.00	0.00	0.00
13,900.00	89.63	180.00	11,663.47	-2,201.06	-101.25	2,201.06	0.00	0.00	0.00
14,000.00	89.63	180.00	11,664.12	-2,301.05	-101.25	2,301.05	0.00	0.00	0.00
14,100.00	89.63	180.00	11,664.77	-2,401.05	-101.25	2,401.05	0.00	0.00	0.00
14,200.00	89.63	180.00	11,665.43	-2,501.05	-101.25	2,501.05	0.00	0.00	0.00
14,300.00	89.63	180.00	11,666.08	-2,601.05	-101.25	2,601.05	0.00	0.00	0.00
14,400.00	89.63	180.00	11,666.73	-2,701.05	-101.25	2,701.05	0.00	0.00	0.00
14,500.00	89.63	180.00	11,667.39	-2,801.04	-101.25	2,801.04	0.00	0.00	0.00
14,600.00	89.63	180.00	11,668.04	-2,901.04	-101.25	2,901.04	0.00	0.00	0.00
14,700.00	89.63	180.00	11,668.69	-3,001.04	-101.25	3,001.04	0.00	0.00	0.00
14,800.00	89.63	180.00	11,669.34	-3,101.04	-101.25	3,101.04	0.00	0.00	0.00
14,900.00	89.63	180.00	11,670.00	-3,201.03	-101.25	3,201.03	0.00	0.00	0.00
15,000.00	89.63	180.00	11,670.65	-3,301.03	-101.25	3,301.03	0.00	0.00	0.00
15,100.00	89.63	180.00	11,671.30	-3,401.03	-101.25	3,401.03	0.00	0.00	0.00
15,200.00	89.63	180.00	11,671.95	-3,501.03	-101.25	3,501.03	0.00	0.00	0.00
15,300.00	89.63	180.00	11,672.61	-3,601.03	-101.25	3,601.03	0.00	0.00	0.00
15,400.00	89.63	180.00	11,673.26	-3,701.02	-101.25	3,701.02	0.00	0.00	0.00
15,500.00	89.63	180.00	11,673.91	-3,801.02	-101.25	3,801.02	0.00	0.00	0.00
15,600.00	89.63	180.00	11,674.57	-3,901.02	-101.25	3,901.02	0.00	0.00	0.00
15,700.00	89.63	180.00	11,675.22	-4,001.02	-101.25	4,001.02	0.00	0.00	0.00
15,800.00	89.63	180.00	11,675.87	-4,101.02	-101.25	4,101.02	0.00	0.00	0.00
15,900.00	89.63	180.00	11,676.52	-4,201.01	-101.25	4,201.01	0.00	0.00	0.00
16,000.00	89.63	180.00	11,677.18	-4,301.01	-101.25	4,301.01	0.00	0.00	0.00
16,100.00	89.63	180.00	11,677.83	-4,401.01	-101.25	4,401.01	0.00	0.00	0.00
16,200.00	89.63	180.00	11,678.48	-4,501.01	-101.25	4,501.01	0.00	0.00	0.00
16,300.00	89.63	180.00	11,679.13	-4,601.01	-101.25	4,601.01	0.00	0.00	0.00



MS Energy Services
Planning Report



Database: EDM 5000.14 Conroe Server
Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Site: Cotton Draw Unit
Well: 518H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,400.00	89.63	180.00	11,679.79	-4,701.00	-101.25	4,701.00	0.00	0.00	0.00
16,500.00	89.63	180.00	11,680.44	-4,801.00	-101.25	4,801.00	0.00	0.00	0.00
16,600.00	89.63	180.00	11,681.09	-4,901.00	-101.25	4,901.00	0.00	0.00	0.00
16,700.00	89.63	180.00	11,681.75	-5,001.00	-101.25	5,001.00	0.00	0.00	0.00
16,800.00	89.63	180.00	11,682.40	-5,100.99	-101.25	5,100.99	0.00	0.00	0.00
16,900.00	89.63	180.00	11,683.05	-5,200.99	-101.25	5,200.99	0.00	0.00	0.00
17,000.00	89.63	180.00	11,683.70	-5,300.99	-101.25	5,300.99	0.00	0.00	0.00
17,100.00	89.63	180.00	11,684.36	-5,400.99	-101.25	5,400.99	0.00	0.00	0.00
17,200.00	89.63	180.00	11,685.01	-5,500.99	-101.25	5,500.99	0.00	0.00	0.00
17,300.00	89.63	180.00	11,685.66	-5,600.98	-101.25	5,600.98	0.00	0.00	0.00
17,400.00	89.63	180.00	11,686.32	-5,700.98	-101.25	5,700.98	0.00	0.00	0.00
17,500.00	89.63	180.00	11,686.97	-5,800.98	-101.25	5,800.98	0.00	0.00	0.00
17,600.00	89.63	180.00	11,687.62	-5,900.98	-101.25	5,900.98	0.00	0.00	0.00
17,700.00	89.63	180.00	11,688.27	-6,000.98	-101.25	6,000.98	0.00	0.00	0.00
17,800.00	89.63	180.00	11,688.93	-6,100.97	-101.25	6,100.97	0.00	0.00	0.00
17,900.00	89.63	180.00	11,689.58	-6,200.97	-101.25	6,200.97	0.00	0.00	0.00
18,000.00	89.63	180.00	11,690.23	-6,300.97	-101.25	6,300.97	0.00	0.00	0.00
18,100.00	89.63	180.00	11,690.88	-6,400.97	-101.25	6,400.97	0.00	0.00	0.00
18,200.00	89.63	180.00	11,691.54	-6,500.96	-101.25	6,500.96	0.00	0.00	0.00
18,300.00	89.63	180.00	11,692.19	-6,600.96	-101.25	6,600.96	0.00	0.00	0.00
18,400.00	89.63	180.00	11,692.84	-6,700.96	-101.25	6,700.96	0.00	0.00	0.00
18,500.00	89.63	180.00	11,693.50	-6,800.96	-101.25	6,800.96	0.00	0.00	0.00
18,600.00	89.63	180.00	11,694.15	-6,900.96	-101.25	6,900.96	0.00	0.00	0.00
18,700.00	89.63	180.00	11,694.80	-7,000.95	-101.25	7,000.95	0.00	0.00	0.00
18,800.00	89.63	180.00	11,695.45	-7,100.95	-101.25	7,100.95	0.00	0.00	0.00
18,900.00	89.63	180.00	11,696.11	-7,200.95	-101.25	7,200.95	0.00	0.00	0.00
19,000.00	89.63	180.00	11,696.76	-7,300.95	-101.25	7,300.95	0.00	0.00	0.00
19,100.00	89.63	180.00	11,697.41	-7,400.95	-101.25	7,400.95	0.00	0.00	0.00
19,200.00	89.63	180.00	11,698.07	-7,500.94	-101.25	7,500.94	0.00	0.00	0.00
19,300.00	89.63	180.00	11,698.72	-7,600.94	-101.25	7,600.94	0.00	0.00	0.00
19,400.00	89.63	180.00	11,699.37	-7,700.94	-101.25	7,700.94	0.00	0.00	0.00
19,500.00	89.63	180.00	11,700.02	-7,800.94	-101.25	7,800.94	0.00	0.00	0.00
19,600.00	89.63	180.00	11,700.68	-7,900.93	-101.25	7,900.93	0.00	0.00	0.00
19,700.00	89.63	180.00	11,701.33	-8,000.93	-101.25	8,000.93	0.00	0.00	0.00
19,800.00	89.63	180.00	11,701.98	-8,100.93	-101.25	8,100.93	0.00	0.00	0.00
19,900.00	89.63	180.00	11,702.63	-8,200.93	-101.25	8,200.93	0.00	0.00	0.00
20,000.00	89.63	180.00	11,703.29	-8,300.93	-101.25	8,300.93	0.00	0.00	0.00
20,100.00	89.63	180.00	11,703.94	-8,400.92	-101.25	8,400.92	0.00	0.00	0.00
20,200.00	89.63	180.00	11,704.59	-8,500.92	-101.25	8,500.92	0.00	0.00	0.00
20,300.00	89.63	180.00	11,705.25	-8,600.92	-101.25	8,600.92	0.00	0.00	0.00
20,400.00	89.63	180.00	11,705.90	-8,700.92	-101.25	8,700.92	0.00	0.00	0.00
20,500.00	89.63	180.00	11,706.55	-8,800.92	-101.25	8,800.92	0.00	0.00	0.00
20,600.00	89.63	180.00	11,707.20	-8,900.91	-101.25	8,900.91	0.00	0.00	0.00
20,700.00	89.63	180.00	11,707.86	-9,000.91	-101.25	9,000.91	0.00	0.00	0.00
20,800.00	89.63	180.00	11,708.51	-9,100.91	-101.25	9,100.91	0.00	0.00	0.00
20,900.00	89.63	180.00	11,709.16	-9,200.91	-101.25	9,200.91	0.00	0.00	0.00
21,000.00	89.63	180.00	11,709.82	-9,300.90	-101.25	9,300.90	0.00	0.00	0.00
21,100.00	89.63	180.00	11,710.47	-9,400.90	-101.25	9,400.90	0.00	0.00	0.00
21,200.00	89.63	180.00	11,711.12	-9,500.90	-101.25	9,500.90	0.00	0.00	0.00
21,300.00	89.63	180.00	11,711.77	-9,600.90	-101.25	9,600.90	0.00	0.00	0.00
21,400.00	89.63	180.00	11,712.43	-9,700.90	-101.25	9,700.90	0.00	0.00	0.00
21,500.00	89.63	180.00	11,713.08	-9,800.89	-101.25	9,800.89	0.00	0.00	0.00
21,600.00	89.63	180.00	11,713.73	-9,900.89	-101.25	9,900.89	0.00	0.00	0.00
21,656.46	89.63	180.00	11,714.10	-9,957.35	-101.25	9,957.35	0.00	0.00	0.00



MS Energy Services Planning Report



Database: EDM 5000.14 Conroe Server
Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Site: Cotton Draw Unit
Well: 518H
Wellbore: Wellbore #1
Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
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PBHL

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Vert - CDU 518H - hit/miss target - Shape - Point	0.00	0.00	8,427.00	279.34	-101.25	430,022.46	717,322.62	32° 10' 51.349 N	103° 45' 52.206 W
PBHL - CDU 518H - plan hits target center - Point	0.00	0.00	11,714.10	-9,957.35	-101.25	419,785.77	717,322.62	32° 9' 10.051 N	103° 45' 52.836 W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
636.10	636.10	Rustler		0.37	180.00
1,005.10	1,005.10	Salado		0.37	180.00
4,164.10	4,164.10	Base of Salt		0.37	180.00
4,374.10	4,374.10	Delaware		0.37	180.00
4,409.10	4,409.10	Bell Canyon		0.37	180.00
5,349.25	5,349.04	Cherry Canyon		0.37	180.00
6,635.02	6,628.25	Brushy Canyon		0.37	180.00
8,001.44	7,987.40	Lower Brushy		0.37	180.00
8,271.76	8,257.31	1BSLM		0.37	180.00
9,316.77	9,302.30	1BSSS		0.37	180.00
9,536.77	9,522.30	2BSLM		0.37	180.00
9,921.77	9,907.30	2BSSS		0.37	180.00
10,441.77	10,427.30	3BSLM		0.37	180.00
11,192.33	11,177.35	3BSSS		0.37	180.00
11,611.17	11,528.71	3BSSS LWR		0.37	180.00

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
5,000.00	5,000.00	0.00	0.00	KOP, 1.00°/100' Build
5,600.13	5,599.03	29.52	-10.70	Begin 6.00° Tangent
7,841.35	7,827.97	249.82	-90.55	Begin 1.00°/100' Drop
8,441.48	8,427.00	279.34	-101.25	Begin Vertical Hold
11,092.52	11,078.05	279.34	-101.25	Begin 10.00°/100' Build
11,988.78	11,650.99	-289.88	-101.25	Begin 89.63° Lateral
21,656.46	11,714.10	-9,957.35	-101.25	PBHL

Devon Energy

Cotton Draw Unit 518H
Eddy County, New Mexico (NAD 83)
North Reference: Grid
KB-MSL: 3514.10
Ground Level: 3489.10
Design #1

MD	INC	AZI	Course Length	TVD	Subsea Depth	N/-S	E/-W	X	Y	Lat	Long	Dogleg Severity	T.Face	Vert Sec
0.00	0.00	0.00	0.00	0.00	3514.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
100.00	0.00	0.00	100.00	100.00	3414.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
200.00	0.00	0.00	100.00	200.00	3314.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
300.00	0.00	0.00	100.00	300.00	3214.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
400.00	0.00	0.00	100.00	400.00	3114.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
500.00	0.00	0.00	100.00	500.00	3014.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
600.00	0.00	0.00	100.00	600.00	2914.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
700.00	0.00	0.00	100.00	700.00	2814.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
800.00	0.00	0.00	100.00	800.00	2714.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
900.00	0.00	0.00	100.00	900.00	2614.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
1000.00	0.00	0.00	100.00	1000.00	2514.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
1100.00	0.00	0.00	100.00	1100.00	2414.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
1200.00	0.00	0.00	100.00	1200.00	2314.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
1300.00	0.00	0.00	100.00	1300.00	2214.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
1400.00	0.00	0.00	100.00	1400.00	2114.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
1500.00	0.00	0.00	100.00	1500.00	2014.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
1600.00	0.00	0.00	100.00	1600.00	1914.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
1700.00	0.00	0.00	100.00	1700.00	1814.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
1800.00	0.00	0.00	100.00	1800.00	1714.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
1900.00	0.00	0.00	100.00	1900.00	1614.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
2000.00	0.00	0.00	100.00	2000.00	1514.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
2100.00	0.00	0.00	100.00	2100.00	1414.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
2200.00	0.00	0.00	100.00	2200.00	1314.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
2300.00	0.00	0.00	100.00	2300.00	1214.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
2400.00	0.00	0.00	100.00	2400.00	1114.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
2500.00	0.00	0.00	100.00	2500.00	1014.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
2600.00	0.00	0.00	100.00	2600.00	914.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
2700.00	0.00	0.00	100.00	2700.00	814.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
2800.00	0.00	0.00	100.00	2800.00	714.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
2900.00	0.00	0.00	100.00	2900.00	614.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
3000.00	0.00	0.00	100.00	3000.00	514.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
3100.00	0.00	0.00	100.00	3100.00	414.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
3200.00	0.00	0.00	100.00	3200.00	314.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
3300.00	0.00	0.00	100.00	3300.00	214.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
3400.00	0.00	0.00	100.00	3400.00	114.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
3500.00	0.00	0.00	100.00	3500.00	14.10	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
3600.00	0.00	0.00	100.00	3600.00	-85.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
3700.00	0.00	0.00	100.00	3700.00	-185.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
3800.00	0.00	0.00	100.00	3800.00	-285.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
3900.00	0.00	0.00	100.00	3900.00	-385.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
4000.00	0.00	0.00	100.00	4000.00	-485.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
4100.00	0.00	0.00	100.00	4100.00	-585.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
4200.00	0.00	0.00	100.00	4200.00	-685.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
4300.00	0.00	0.00	100.00	4300.00	-785.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
4400.00	0.00	0.00	100.00	4400.00	-885.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
4500.00	0.00	0.00	100.00	4500.00	-985.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
4600.00	0.00	0.00	100.00	4600.00	-1085.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
4700.00	0.00	0.00	100.00	4700.00	-1185.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
4800.00	0.00	0.00	100.00	4800.00	-1285.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
4900.00	0.00	0.00	100.00	4900.00	-1385.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00	
5000.00	0.00	0.00	100.00	5000.00	-1485.90	0.00	0.00	717423.87	429743.12	32° 10' 48.103° 45' 51	0.00	0.00	0.00 KOP, 1.00°/100' Build	
5100.00	1.00	340.08	100.00	5099.99	-1585.89	0.82	-0.30	717423.57	429743.94	32° 10' 48.103° 45' 51	1.00	340.08	-0.82	
5200.00	2.00	340.08	100.00	5199.96	-1685.86	3.28	-1.19	717422.68	429746.40	32° 10' 48.103° 45' 51	1.00	0.00	-3.28	
5300.00	3.00	340.08	100.00	5299.86	-1785.76	7.38	-2.68	717421.19	429750.50	32° 10' 48.103° 45' 51	1.00	0.00	-7.38	
5400.00	4.00	340.08	100.00	5399.68	-1885.58	13.12	-4.76	717419.11	429756.24	32° 10' 48.103° 45' 51	1.00	0.00	-13.12	
5500.00	5.00	340.08	100.00	5499.37	-1985.27	20.50	-7.43	717416.44	429763.62	32° 10' 48.103° 45' 51	1.00	0.00	-20.50	
5600.13	6.00	340.08	100.13	5599.03	-2084.93	29.52	-10.70	717413.17	429772.64	32° 10' 48.103° 45' 51	1.00	0.00	-29.52 Begin 6.00° Tangent	
5700.00	6.00	340.08	99.87	5698.36	-2184.26	39.34	-14.26	717409.61	429782.46	32° 10' 48.103° 45' 51	0.00	0.00	-39.34	
5800.00	6.00	340.08	100.00	5797.81	-2283.71	49.17	-17.82	717406.05	429792.29	32° 10' 49.103° 45' 51	0.00	0.00	-49.17	
5900.00	6.00	340.08	100.00	5897.26	-2383.16	59.00	-21.38	717402.49	429802.12	32° 10' 49.103° 45' 51	0.00	0.00	-59.00	
6000.00	6.00	340.08	100.00	5996.71	-2482.61	68.83	-24.95	717398.92	429811.94	32° 10' 49.103° 45' 51	0.00	0.00	-68.83	
6100.00	6.00	340.08	100.00	6096.16	-2582.06	78.65	-28.51	717395.36	429821.77	32° 10' 49.103° 45' 51	0.00	0.00	-78.65	
6200.00	6.00	340.08	100.00	6195.62	-2681.52	88.48	-32.07	717391.80	429831.60	32° 10' 49.103° 45' 51	0.00	0.00	-88.48	
6300.00	6.00	340.08	100.00	6295.07	-2780.97	98.31	-35.64	717388.23	429841.43	32° 10' 49.103° 45' 51	0.00	0.00	-98.31	
6400.00	6.00	340.08	100.00	6394.52	-2880.42	108.14	-39.20	717384.67	429851.26	32° 10' 49.103° 45' 51	0.00	0.00	-108.14	
6500.00	6.00	340.08	100.00	6493.97	-2979.87	117.97	-42.76	717381.11	429861.09	32° 10' 49.103° 45' 51	0.00	0.00	-117.97	
6600.00	6.00	340.08	100.00	6593.42	-3079.32	127.80	-46.32	717377.55	429870.92	32° 10' 49.103° 45' 51	0.00	0.00	-127.80	
6700.00	6.00	340.08	100.00	6692.88	-3178.78	137.63	-49.89	717373.98	429880.75	32° 10' 49.103° 45' 51	0.00	0.00	-137.63	
6800.00	6.00	340.08	100.00	6792.33	-3278.23	147.46	-53.45	717370.42	429890.58	32° 10' 50.103° 45' 51	0.00	0.00	-147.46	
6900.00	6.00	340.08	100.00	6891.78	-3377.68	157.29	-57.01	717366.86	429900.41	32° 10' 50.103° 45' 51	0.00	0.00	-157.29	
7000.00	6.00	340.08	100.00	6991.23	-3477.13	167.12	-60.57	717363.30	429910.24	32° 10' 50.1				

7500.00	6.00	340.08	100.00	7488.49	-3974.39	216.26	-78.39	717345.48	429959.38	32° 10' 50.103° 45' 51	0.00	0.00	-216.26
7600.00	6.00	340.08	100.00	7587.94	-4073.84	226.09	-81.95	717341.92	429969.21	32° 10' 50.103° 45' 51	0.00	0.00	-226.09
7700.00	6.00	340.08	100.00	7687.40	-4173.30	235.92	-85.51	717338.36	429979.04	32° 10' 50.103° 45' 52	0.00	0.00	-235.92
7800.00	6.00	340.08	100.00	7786.85	-4272.75	245.75	-89.08	717334.79	429988.87	32° 10' 51.103° 45' 52	0.00	0.00	-245.75
7841.35	6.00	340.08	41.35	7827.97	-4313.87	249.82	-90.55	717333.32	429992.94	32° 10' 51.103° 45' 52	0.00	0.00	-249.82
7900.00	5.41	340.08	58.65	7886.33	-4372.23	255.30	-92.54	717331.33	429998.42	32° 10' 51.103° 45' 52	1.00	180.00	-255.30
8000.00	4.41	340.08	100.00	7985.96	-4471.86	263.36	-95.46	717328.41	430006.47	32° 10' 51.103° 45' 52	1.00	180.00	-263.36
8100.00	3.41	340.08	100.00	8085.73	-4571.63	269.77	-97.78	717326.09	430012.89	32° 10' 51.103° 45' 52	1.00	180.00	-269.77
8200.00	2.41	340.08	100.00	8185.60	-4671.50	274.55	-99.52	717324.35	430017.67	32° 10' 51.103° 45' 52	1.00	180.00	-274.55
8300.00	1.41	340.08	100.00	8285.54	-4771.44	277.70	-100.65	717323.22	430020.82	32° 10' 51.103° 45' 52	1.00	180.00	-277.70
8400.00	0.41	340.08	100.00	8385.52	-4871.42	279.20	-101.20	717322.67	430022.32	32° 10' 51.103° 45' 52	1.00	180.00	-279.20
8441.48	0.00	0.00	41.48	8427.00	-4912.90	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	1.00	180.00	-279.34
8500.00	0.00	0.00	58.52	8485.52	-4971.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
8600.00	0.00	0.00	100.00	8585.52	-5071.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
8700.00	0.00	0.00	100.00	8685.52	-5171.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
8800.00	0.00	0.00	100.00	8785.52	-5271.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
8900.00	0.00	0.00	100.00	8885.52	-5371.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
9000.00	0.00	0.00	100.00	8985.52	-5471.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
9100.00	0.00	0.00	100.00	9085.52	-5571.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
9200.00	0.00	0.00	100.00	9185.52	-5671.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
9300.00	0.00	0.00	100.00	9285.52	-5771.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
9400.00	0.00	0.00	100.00	9385.52	-5871.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
9500.00	0.00	0.00	100.00	9485.52	-5971.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
9600.00	0.00	0.00	100.00	9585.52	-6071.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
9700.00	0.00	0.00	100.00	9685.52	-6171.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
9800.00	0.00	0.00	100.00	9785.52	-6271.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
9900.00	0.00	0.00	100.00	9885.52	-6371.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
10000.00	0.00	0.00	100.00	9985.52	-6471.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
10100.00	0.00	0.00	100.00	10085.52	-6571.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
10200.00	0.00	0.00	100.00	10185.52	-6671.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
10300.00	0.00	0.00	100.00	10285.52	-6771.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
10400.00	0.00	0.00	100.00	10385.52	-6871.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
10500.00	0.00	0.00	100.00	10485.52	-6971.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
10600.00	0.00	0.00	100.00	10585.52	-7071.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
10700.00	0.00	0.00	100.00	10685.52	-7171.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
10800.00	0.00	0.00	100.00	10785.52	-7271.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
10900.00	0.00	0.00	100.00	10885.52	-7371.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
11000.00	0.00	0.00	100.00	10985.52	-7471.42	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
11092.52	0.00	0.00	92.52	11078.05	-7563.95	279.34	-101.25	717322.62	430022.46	32° 10' 51.103° 45' 52	0.00	0.00	-279.34
11100.00	0.75	180.00	7.48	11085.52	-7571.42	279.29	-101.25	717322.62	430022.41	32° 10' 51.103° 45' 52	10.00	180.00	-279.29
11150.00	5.75	180.00	50.00	11135.43	-7621.33	276.46	-101.25	717322.62	430019.58	32° 10' 51.103° 45' 52	10.00	0.00	-276.46
11200.00	10.75	180.00	50.00	11184.89	-7670.79	269.29	-101.25	717322.62	430012.41	32° 10' 51.103° 45' 52	10.00	0.00	-269.29
11250.00	15.75	180.00	50.00	11233.55	-7719.45	257.83	-101.25	717322.62	430000.95	32° 10' 51.103° 45' 52	10.00	0.00	-257.83
11300.00	20.75	180.00	50.00	11281.02	-7766.92	242.18	-101.25	717322.62	429985.30	32° 10' 50.103° 45' 52	10.00	0.00	-242.18
11350.00	25.75	180.00	50.00	11326.94	-7812.84	222.45	-101.25	717322.62	429965.57	32° 10' 50.103° 45' 52	10.00	0.00	-222.45
11400.00	30.75	180.00	50.00	11370.98	-7856.88	198.80	-101.25	717322.62	429941.91	32° 10' 50.103° 45' 52	10.00	0.00	-198.80
11450.00	35.75	180.00	50.00	11412.78	-7898.68	171.39	-101.25	717322.62	429914.51	32° 10' 50.103° 45' 52	10.00	0.00	-171.39
11500.00	40.75	180.00	50.00	11452.03	-7937.93	140.45	-101.25	717322.62	429883.57	32° 10' 49.103° 45' 52	10.00	0.00	-140.45
11550.00	45.75	180.00	50.00	11488.44	-7974.34	106.20	-101.25	717322.62	429849.32	32° 10' 49.103° 45' 52	10.00	0.00	-106.20
11600.00	50.75	180.00	50.00	11521.73	-8007.63	68.91	-101.25	717322.62	429812.03	32° 10' 49.103° 45' 52	10.00	0.00	-68.91
11650.00	55.75	180.00	50.00	11551.63	-8037.53	28.86	-101.25	717322.62	429771.98	32° 10' 48.103° 45' 52	10.00	0.00	-28.86
11700.00	60.75	180.00	50.00	11577.94	-8063.84	-13.64	-101.25	717322.62	429729.48	32° 10' 48.103° 45' 52	10.00	0.00	-13.64
11750.00	65.75	180.00	50.00	11600.44	-8086.34	-58.27	-101.25	717322.62	429684.84	32° 10' 48.103° 45' 52	10.00	0.00	-58.27
11800.00	70.75	180.00	50.00	11618.96	-8104.86	-104.70	-101.25	717322.62	429638.42	32° 10' 47.103° 45' 52	10.00	0.00	-104.70
11850.00	75.75	180.00	50.00	11633.37	-8119.27	-152.56	-101.25	717322.62	429590.56	32° 10' 47.103° 45' 52	10.00	0.00	-152.56
11900.00	80.75	180.00	50.00	11643.55	-8129.45	-201.50	-101.25	717322.62	429541.62	32° 10' 46.103° 45' 52	10.00	0.00	-201.50
11950.00	85.75	180.00	50.00	11649.43	-8135.33	-251.14	-101.25	717322.62	429491.98	32° 10' 46.103° 45' 52	10.00	0.00	-251.14
11988.78	89.63	180.00	38.78	11650.99	-8136.89	-289.88	-101.25	717322.62	429453.24	32° 10' 45.103° 45' 52	10.00	0.00	-289.88
12000.00	89.63	180.00	11.22	11651.07	-8136.97	-301.10	-101.25	717322.62	429442.02	32° 10' 45.103° 45' 52	0.00	0.00	-301.10
12100.00	89.63	180.00	100.00	11651.72	-8137.62	-401.09	-101.25	717322.62	429342.02	32° 10' 44.103° 45' 52	0.00	0.00	-401.09
12200.00	89.63	180.00	100.00	11652.37	-8138.27	-501.09	-101.25	717322.62	429242.03	32° 10' 43.103° 45' 52	0.00	0.00	-501.09
12300.00	89.63	180.00	100.00	11653.02	-8138.92	-601.09	-101.25	717322.62	429142.03	32° 10' 42.103° 45' 52	0.00	0.00	-601.09
12400.00	89.63	180.00	100.00	11653.68	-8139.58	-701.09	-101.25	717322.62	429042.03	32° 10' 41.103° 45' 52	0.00	0.00	-701.09
12500.00	89.63	180.00	100.00	11654.33	-8140.23	-801.09	-101.25	717322.62	428942.03	32° 10' 40.103° 45' 52	0.00	0.00	-801.09
12600.00	89.63	180.00	100.00	11654.98	-8140.88	-901.08	-101.25	717322.62	428842.04	32° 10' 39.103° 45' 52	0.00	0.00	-901.08
12700.00	89.63	180.00	100.00	11655.63	-8141.53	-1001.08	-101.25	717322.62	428742.04	32° 10' 38.103° 45' 52	0.00	0.00	-1001.08
12800.00	89.63	180.00	100.00	11656.29	-8142.19	-1101.08	-101.25	717322.62	428642.04	32° 10' 37.103° 45' 52	0.00	0.00	-1101.08
12900.00	89.63	180.00	100.00	11656.94	-8142.84	-1201.08	-101.25	717322.62	428542.04	32° 10' 36.103° 45' 52	0.00	0.00	-1201.08
13000.00	89.63	180.00	100.00	11657.59	-8143.49	-1301.08	-101.25	717322.62	428442.04	32° 10' 35.103° 45' 52	0.00	0.00	-1301.08
13100.00	8												

14900.00	89.63	180.00	100.00	11670.00	-8155.90	-3201.03	-101.25	717322.62	426542.08	32° 10' 16.1" 103° 45' 52"	0.00	0.00	3201.03
15000.00	89.63	180.00	100.00	11670.65	-8156.55	-3301.03	-101.25	717322.62	426442.09	32° 10' 15.1" 103° 45' 52"	0.00	0.00	3301.03
15100.00	89.63	180.00	100.00	11671.30	-8157.20	-3401.03	-101.25	717322.62	426342.09	32° 10' 14.1" 103° 45' 52"	0.00	0.00	3401.03
15200.00	89.63	180.00	100.00	11671.95	-8157.85	-3501.03	-101.25	717322.62	426242.09	32° 10' 13.1" 103° 45' 52"	0.00	0.00	3501.03
15300.00	89.63	180.00	100.00	11672.61	-8158.51	-3601.03	-101.25	717322.62	426142.09	32° 10' 12.1" 103° 45' 52"	0.00	0.00	3601.03
15400.00	89.63	180.00	100.00	11673.26	-8159.16	-3701.02	-101.25	717322.62	426042.09	32° 10' 11.1" 103° 45' 52"	0.00	0.00	3701.02
15500.00	89.63	180.00	100.00	11673.91	-8159.81	-3801.02	-101.25	717322.62	425942.10	32° 10' 10.1" 103° 45' 52"	0.00	0.00	3801.02
15600.00	89.63	180.00	100.00	11674.57	-8160.47	-3901.02	-101.25	717322.62	425842.10	32° 10' 9.9" 103° 45' 52"	0.00	0.00	3901.02
15700.00	89.63	180.00	100.00	11675.22	-8161.12	-4001.02	-101.25	717322.62	425742.10	32° 10' 8.9" 103° 45' 52"	0.00	0.00	4001.02
15800.00	89.63	180.00	100.00	11675.87	-8161.77	-4101.02	-101.25	717322.62	425642.10	32° 10' 8.0" 103° 45' 52"	0.00	0.00	4101.02
15900.00	89.63	180.00	100.00	11676.52	-8162.42	-4201.01	-101.25	717322.62	425542.11	32° 10' 7.0" 103° 45' 52"	0.00	0.00	4201.01
16000.00	89.63	180.00	100.00	11677.18	-8163.08	-4301.01	-101.25	717322.62	425442.11	32° 10' 6.0" 103° 45' 52"	0.00	0.00	4301.01
16100.00	89.63	180.00	100.00	11677.83	-8163.73	-4401.01	-101.25	717322.62	425342.11	32° 10' 5.0" 103° 45' 52"	0.00	0.00	4401.01
16200.00	89.63	180.00	100.00	11678.48	-8164.38	-4501.01	-101.25	717322.62	425242.11	32° 10' 4.0" 103° 45' 52"	0.00	0.00	4501.01
16300.00	89.63	180.00	100.00	11679.13	-8165.03	-4601.00	-101.25	717322.62	425142.11	32° 10' 3.0" 103° 45' 52"	0.00	0.00	4601.00
16400.00	89.63	180.00	100.00	11679.79	-8165.69	-4701.00	-101.25	717322.62	425042.12	32° 10' 2.0" 103° 45' 52"	0.00	0.00	4701.00
16500.00	89.63	180.00	100.00	11680.44	-8166.34	-4801.00	-101.25	717322.62	424942.12	32° 10' 1.0" 103° 45' 52"	0.00	0.00	4801.00
16600.00	89.63	180.00	100.00	11681.09	-8166.99	-4901.00	-101.25	717322.62	424842.12	32° 10' 0.0" 103° 45' 52"	0.00	0.00	4901.00
16700.00	89.63	180.00	100.00	11681.75	-8167.65	-5001.00	-101.25	717322.62	424742.12	32° 9' 59.0" 103° 45' 52"	0.00	0.00	5001.00
16800.00	89.63	180.00	100.00	11682.40	-8168.30	-5100.99	-101.25	717322.62	424642.12	32° 9' 58.1" 103° 45' 52"	0.00	0.00	5100.99
16900.00	89.63	180.00	100.00	11683.05	-8168.95	-5200.99	-101.25	717322.62	424542.13	32° 9' 57.1" 103° 45' 52"	0.00	0.00	5200.99
17000.00	89.63	180.00	100.00	11683.70	-8169.60	-5300.99	-101.25	717322.62	424442.13	32° 9' 56.1" 103° 45' 52"	0.00	0.00	5300.99
17100.00	89.63	180.00	100.00	11684.36	-8170.26	-5400.99	-101.25	717322.62	424342.13	32° 9' 55.1" 103° 45' 52"	0.00	0.00	5400.99
17200.00	89.63	180.00	100.00	11685.01	-8170.91	-5500.99	-101.25	717322.62	424242.13	32° 9' 54.1" 103° 45' 52"	0.00	0.00	5500.99
17300.00	89.63	180.00	100.00	11685.66	-8171.56	-5600.98	-101.25	717322.62	424142.14	32° 9' 53.1" 103° 45' 52"	0.00	0.00	5600.98
17400.00	89.63	180.00	100.00	11686.32	-8172.22	-5700.98	-101.25	717322.62	424042.14	32° 9' 52.1" 103° 45' 52"	0.00	0.00	5700.98
17500.00	89.63	180.00	100.00	11686.97	-8172.87	-5800.98	-101.25	717322.62	423942.14	32° 9' 51.1" 103° 45' 52"	0.00	0.00	5800.98
17600.00	89.63	180.00	100.00	11687.62	-8173.52	-5900.98	-101.25	717322.62	423842.14	32° 9' 50.1" 103° 45' 52"	0.00	0.00	5900.98
17700.00	89.63	180.00	100.00	11688.27	-8174.17	-6000.98	-101.25	717322.62	423742.14	32° 9' 49.2" 103° 45' 52"	0.00	0.00	6000.98
17800.00	89.63	180.00	100.00	11688.93	-8174.83	-6100.97	-101.25	717322.62	423642.15	32° 9' 48.2" 103° 45' 52"	0.00	0.00	6100.97
17900.00	89.63	180.00	100.00	11689.58	-8175.48	-6200.97	-101.25	717322.62	423542.15	32° 9' 47.2" 103° 45' 52"	0.00	0.00	6200.97
18000.00	89.63	180.00	100.00	11690.23	-8176.13	-6300.97	-101.25	717322.62	423442.15	32° 9' 46.2" 103° 45' 52"	0.00	0.00	6300.97
18100.00	89.63	180.00	100.00	11690.88	-8176.78	-6400.97	-101.25	717322.62	423342.15	32° 9' 45.2" 103° 45' 52"	0.00	0.00	6400.97
18200.00	89.63	180.00	100.00	11691.54	-8177.44	-6500.96	-101.25	717322.62	423242.15	32° 9' 44.2" 103° 45' 52"	0.00	0.00	6500.96
18300.00	89.63	180.00	100.00	11692.19	-8178.09	-6600.96	-101.25	717322.62	423142.16	32° 9' 43.2" 103° 45' 52"	0.00	0.00	6600.96
18400.00	89.63	180.00	100.00	11692.84	-8178.74	-6700.96	-101.25	717322.62	423042.16	32° 9' 42.2" 103° 45' 52"	0.00	0.00	6700.96
18500.00	89.63	180.00	100.00	11693.50	-8179.40	-6800.96	-101.25	717322.62	422942.16	32° 9' 41.2" 103° 45' 52"	0.00	0.00	6800.96
18600.00	89.63	180.00	100.00	11694.15	-8180.05	-6900.96	-101.25	717322.62	422842.16	32° 9' 40.2" 103° 45' 52"	0.00	0.00	6900.96
18700.00	89.63	180.00	100.00	11694.80	-8180.70	-7000.95	-101.25	717322.62	422742.17	32° 9' 39.3" 103° 45' 52"	0.00	0.00	7000.95
18800.00	89.63	180.00	100.00	11695.45	-8181.35	-7100.95	-101.25	717322.62	422642.17	32° 9' 38.3" 103° 45' 52"	0.00	0.00	7100.95
18900.00	89.63	180.00	100.00	11696.11	-8182.01	-7200.95	-101.25	717322.62	422542.17	32° 9' 37.3" 103° 45' 52"	0.00	0.00	7200.95
19000.00	89.63	180.00	100.00	11696.76	-8182.66	-7300.95	-101.25	717322.62	422442.17	32° 9' 36.3" 103° 45' 52"	0.00	0.00	7300.95
19100.00	89.63	180.00	100.00	11697.41	-8183.31	-7400.95	-101.25	717322.62	422342.17	32° 9' 35.3" 103° 45' 52"	0.00	0.00	7400.95
19200.00	89.63	180.00	100.00	11698.06	-8183.96	-7500.94	-101.25	717322.62	422242.18	32° 9' 34.3" 103° 45' 52"	0.00	0.00	7500.94
19300.00	89.63	180.00	100.00	11698.72	-8184.62	-7600.94	-101.25	717322.62	422142.18	32° 9' 33.3" 103° 45' 52"	0.00	0.00	7600.94
19400.00	89.63	180.00	100.00	11699.37	-8185.27	-7700.94	-101.25	717322.62	422042.18	32° 9' 32.3" 103° 45' 52"	0.00	0.00	7700.94
19500.00	89.63	180.00	100.00	11700.02	-8185.92	-7800.94	-101.25	717322.62	421942.18	32° 9' 31.3" 103° 45' 52"	0.00	0.00	7800.94
19600.00	89.63	180.00	100.00	11700.68	-8186.58	-7900.93	-101.25	717322.62	421842.18	32° 9' 30.4" 103° 45' 52"	0.00	0.00	7900.93
19700.00	89.63	180.00	100.00	11701.33	-8187.23	-8000.93	-101.25	717322.62	421742.19	32° 9' 29.4" 103° 45' 52"	0.00	0.00	8000.93
19800.00	89.63	180.00	100.00	11701.98	-8187.88	-8100.93	-101.25	717322.62	421642.19	32° 9' 28.4" 103° 45' 52"	0.00	0.00	8100.93
19900.00	89.63	180.00	100.00	11702.63	-8188.53	-8200.93	-101.25	717322.62	421542.19	32° 9' 27.4" 103° 45' 52"	0.00	0.00	8200.93
20000.00	89.63	180.00	100.00	11703.29	-8189.19	-8300.93	-101.25	717322.62	421442.19	32° 9' 26.4" 103° 45' 52"	0.00	0.00	8300.93
20100.00	89.63	180.00	100.00	11703.94	-8189.84	-8400.92	-101.25	717322.62	421342.20	32° 9' 25.4" 103° 45' 52"	0.00	0.00	8400.92
20200.00	89.63	180.00	100.00	11704.59	-8190.49	-8500.92	-101.25	717322.62	421242.20	32° 9' 24.4" 103° 45' 52"	0.00	0.00	8500.92
20300.00	89.63	180.00	100.00	11705.25	-8191.15	-8600.92	-101.25	717322.62	421142.20	32° 9' 23.4" 103° 45' 52"	0.00	0.00	8600.92
20400.00	89.63	180.00	100.00	11705.90	-8191.80	-8700.92	-101.25	717322.62	421042.20	32° 9' 22.4" 103° 45' 52"	0.00	0.00	8700.92
20500.00	89.63	180.00	100.00	11706.55	-8192.45	-8800.92	-101.25	717322.62	420942.20	32° 9' 21.4" 103° 45' 52"	0.00	0.00	8800.92
20600.00	89.63	180.00	100.00	11707.20	-8193.10	-8900.91	-101.25	717322.62	420842.21	32° 9' 20.5" 103° 45' 52"	0.00	0.00	8900.91
20700.00	89.63	180.00	100.00	11707.86	-8193.76	-9000.91	-101.25	717322.62	420742.21	32° 9' 19.5" 103° 45' 52"	0.00	0.00	9000.91
20800.00	89.63	180.00	100.00	11708.51	-8194.41	-9100.91	-101.25	717322.62	420642.21	32° 9' 18.5" 103° 45' 52"	0.00	0.00	9100.91
20900.00	89.63	180.00	100.00	11709.16	-8195.06	-9200.91	-101.25	717322.62	420542.21	32° 9' 17.5" 103° 45' 52"	0.00	0.00	9200.91
21000.00	89.63	180.00	100.00	11709.81	-8195.71	-9300.90	-101.25	717322.62	420442.21	32° 9' 16.5" 103° 45' 52"	0.00	0.00	9300.90
21100.00	89.63	180.00	100.00	11710.47	-8196.37	-9400.90	-101.25	717322.62	420342.22	32° 9' 15.5" 103° 45' 52"	0.00	0.00	9400.90
21200.00	89.63	180.00	100.00	11711.12	-8197.02	-9500.90	-101.25	717322.62	420242.22	32° 9' 14.5" 103° 45' 52"	0.00	0.00	9500.90
21300.00	89.63	180.00	100.00	11711.77	-8197.67	-9600.90	-101.25	717322.62	420142.22	32° 9' 13.5" 103° 45' 52"	0.00	0.00	9600.90
21400.00	89.63	180.00	100.00	11712.43	-8198.33	-9700.90	-101.25	717322.62	420042.22	32° 9' 12.5" 103° 45' 52"	0.00	0.00	9700.90
21500.00	89.63	180.00	100.00	11713.08	-8198.98	-9800.89	-101.25	717322.62	419942.22	32° 9' 11.5" 103° 45' 52"	0.00	0.00	9800.89
21600.00	89.63												



Devon Energy

Eddy County, New Mexico (NAD 83)
Cotton Draw Unit
518H

Wellbore #1
Design #1

Anticollision Report

31 August, 2017



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Reference	Design #1
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD + Stations Interval 100.00usft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 10,000.00 u
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Pedal Curve
Casing Method:	Not applied

Survey Tool Program Date 8/31/2017

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	21,656.46	Design #1 (Wellbore #1)	MWD	OWSG MWD - Standard

Summary

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Cotton Draw Unit						
#89 - Wellbore #1 - Surveys	21,656.46	11,642.95	485.20	278.25	2.344	CC, ES, SF
#89 - Wellbore #2 - Surveys	21,656.46	11,642.95	485.20	278.25	2.344	CC, ES, SF
153H - Wellbore #1 - Surveys	19,561.47	10,716.97	3,445.37	3,351.58	36.732	CC
153H - Wellbore #1 - Surveys	20,600.00	20,600.00	3,451.47	3,279.11	20.025	ES, SF
154H - Wellbore #1 - Surveys	18,600.00	18,600.00	3,839.60	3,668.27	22.410	SF
154H - Wellbore #1 - Surveys	20,936.48	12,018.33	3,814.94	3,674.16	27.099	CC
154H - Wellbore #1 - Surveys	21,500.00	12,553.31	3,816.75	3,666.00	25.318	ES
216Y - Wellbore #1 - Surveys	17,043.32	14,772.90	1,342.43	1,241.86	13.348	CC
216Y - Wellbore #1 - Surveys	17,100.00	14,723.97	1,342.61	1,241.58	13.290	ES
216Y - Wellbore #1 - Surveys	21,200.00	10,710.00	1,447.02	1,322.32	11.604	SF
217H - Wellbore #1 - Surveys	19,800.00	19,800.00	2,109.51	1,867.68	8.723	ES, SF
217H - Wellbore #1 - Surveys	21,142.03	10,774.14	2,077.15	1,915.77	12.871	CC
272H - Wellbore #1 - Surveys	21,609.04	14,872.00	1,794.28	1,631.34	11.012	CC, ES
272H - Wellbore #1 - Surveys	21,656.46	14,872.00	1,794.91	1,631.43	10.979	SF

Offset Design Cotton Draw Unit - #89 - Wellbore #1 - Surveys											
Survey Program: 100-GYRO-NS											
Offset Site Error: 0.00 usft											
Offset Well Error: 0.00 usft											
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation Factor
0.00	0.00	0.00	0.00	0.00	0.00	178.60	-9,912.81	242.43	9,916.03		
100.00	100.00	28.91	28.91	0.13	0.04	178.60	-9,912.81	242.44	9,915.78	9,915.61	0.17 N/A
200.00	200.00	119.18	119.18	0.49	0.20	178.60	-9,912.84	242.55	9,915.81	9,915.12	0.69 N/A
300.00	300.00	191.57	191.57	0.85	0.45	178.60	-9,913.02	242.74	9,916.06	9,914.76	1.30 7,612.401
400.00	400.00	331.39	331.39	1.21	0.94	178.60	-9,913.24	242.95	9,916.22	9,914.07	2.15 4,614.762
478.68	478.68	409.54	409.53	1.49	1.21	178.59	-9,913.23	243.17	9,916.21	9,913.50	2.70 3,667.896
500.00	500.00	426.10	426.09	1.57	1.27	178.59	-9,913.23	243.23	9,916.21	9,913.38	2.84 3,494.338
600.00	600.00	500.00	500.00	1.93	1.53	178.59	-9,913.30	243.48	9,916.34	9,912.88	3.45 2,870.684
700.00	700.00	549.09	549.09	2.29	1.70	178.59	-9,913.54	243.53	9,916.86	9,912.88	3.98 2,488.966
800.00	800.00	600.00	599.99	2.64	1.88	178.59	-9,914.13	243.38	9,917.97	9,913.45	4.52 2,193.990
900.00	900.00	641.48	641.46	3.00	2.03	178.60	-9,914.84	243.12	9,919.61	9,914.58	5.02 1,974.378
1,000.00	1,000.00	700.00	699.97	3.36	2.23	178.60	-9,916.14	242.56	9,921.77	9,916.18	5.59 1,775.753
1,100.00	1,100.00	779.70	779.64	3.72	2.52	178.60	-9,918.16	241.64	9,924.26	9,918.03	6.23 1,594.172
1,200.00	1,200.00	896.68	896.57	4.08	2.93	178.61	-9,921.06	240.32	9,926.72	9,919.72	6.99 1,419.254

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - #89 - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
1,300.00	1,300.00	1,036.87	1,036.73	4.44	3.42	178.62	-9,924.12	239.09	9,928.88	9,921.03	7.84	1,265.728		
1,400.00	1,400.00	1,173.56	1,173.39	4.79	3.90	178.62	-9,926.51	238.62	9,930.61	9,921.93	8.68	1,143.838		
1,500.00	1,500.00	1,281.86	1,281.68	5.15	4.28	178.62	-9,928.15	238.69	9,932.13	9,922.71	9.42	1,054.405		
1,600.00	1,600.00	1,382.67	1,382.48	5.51	4.63	178.62	-9,929.65	238.86	9,933.61	9,923.48	10.13	980.491		
1,700.00	1,700.00	1,563.41	1,563.21	5.87	5.26	178.62	-9,931.34	239.95	9,934.46	9,923.34	11.12	893.187		
1,800.00	1,800.00	1,721.79	1,721.57	6.23	5.81	178.60	-9,931.92	242.38	9,934.88	9,922.85	12.03	825.525		
1,900.00	1,900.00	1,812.74	1,812.49	6.59	6.13	178.59	-9,932.01	244.29	9,935.03	9,922.32	12.71	781.592		
2,000.00	2,000.00	1,933.89	1,933.61	6.95	6.56	178.57	-9,931.98	247.31	9,935.06	9,921.56	13.49	736.263		
2,076.86	2,076.86	2,007.23	2,006.93	7.22	6.81	178.56	-9,931.92	249.13	9,935.04	9,921.02	14.03	708.318		
2,100.00	2,100.00	2,025.15	2,024.84	7.30	6.88	178.56	-9,931.91	249.57	9,935.05	9,920.88	14.17	701.036		
2,200.00	2,200.00	2,110.47	2,110.13	7.66	7.17	178.55	-9,931.98	251.72	9,935.19	9,920.36	14.83	669.974		
2,300.00	2,300.00	2,224.15	2,223.77	8.02	7.57	178.53	-9,932.02	254.77	9,935.29	9,919.70	15.59	637.459		
2,400.00	2,400.00	2,311.34	2,310.94	8.38	7.88	178.52	-9,932.06	257.04	9,935.40	9,919.15	16.25	611.425		
2,500.00	2,500.00	2,385.07	2,384.64	8.74	8.14	178.51	-9,932.25	258.95	9,935.73	9,918.86	16.87	589.090		
2,600.00	2,600.00	2,481.76	2,481.29	9.10	8.47	178.49	-9,932.66	261.46	9,936.22	9,918.66	17.56	565.741		
2,700.00	2,700.00	2,561.37	2,560.88	9.45	8.75	178.48	-9,933.06	263.38	9,936.79	9,918.59	18.20	545.971		
2,800.00	2,800.00	2,635.23	2,634.72	9.81	9.01	178.47	-9,933.63	264.98	9,937.62	9,918.80	18.82	528.121		
2,900.00	2,900.00	2,713.74	2,713.21	10.17	9.29	178.46	-9,934.44	266.73	9,938.71	9,919.26	19.45	510.991		
3,000.00	3,000.00	2,818.35	2,817.79	10.53	9.65	178.45	-9,935.52	269.06	9,939.80	9,919.62	20.17	492.691		
3,100.00	3,100.00	2,880.91	2,880.32	10.89	9.87	178.44	-9,936.31	270.45	9,941.11	9,920.36	20.75	479.059		
3,200.00	3,200.00	2,970.56	2,969.95	11.25	10.19	178.43	-9,937.69	272.41	9,942.71	9,921.29	21.42	464.105		
3,300.00	3,300.00	3,000.00	3,146.82	11.61	11.34	178.41	-9,939.96	276.38	9,944.15	9,921.22	22.94	433.550		
3,400.00	3,400.00	3,326.00	3,325.20	11.96	11.43	178.37	-9,940.39	282.61	9,944.41	9,921.02	23.39	425.215		
3,500.00	3,500.00	3,400.00	3,399.16	12.32	11.69	178.36	-9,940.35	285.22	9,944.49	9,920.48	24.00	414.271		
3,600.00	3,600.00	3,459.55	3,458.67	12.68	11.90	178.34	-9,940.52	287.25	9,944.92	9,920.35	24.57	404.728		
3,700.00	3,700.00	3,509.73	3,508.83	13.04	12.08	178.33	-9,940.96	288.99	9,945.90	9,920.80	25.11	396.161		
3,800.00	3,800.00	3,579.15	3,578.20	13.40	12.32	178.32	-9,941.84	291.46	9,947.27	9,921.57	25.71	386.946		
3,900.00	3,900.00	3,645.15	3,644.14	13.76	12.55	178.31	-9,942.88	293.97	9,948.96	9,922.67	26.30	378.337		
4,000.00	4,000.00	3,712.23	3,711.14	14.11	12.79	178.29	-9,944.17	296.89	9,951.01	9,924.12	26.89	370.067		
4,100.00	4,100.00	3,793.87	3,792.68	14.47	13.07	178.27	-9,945.93	300.59	9,953.30	9,925.76	27.53	361.479		
4,200.00	4,200.00	3,852.60	3,851.34	14.83	13.28	178.25	-9,947.36	303.17	9,955.88	9,927.78	28.10	354.328		
4,300.00	4,300.00	3,914.83	3,913.49	15.19	13.50	178.24	-9,949.17	305.73	9,958.89	9,930.22	28.67	347.328		
4,400.00	4,400.00	4,004.95	4,003.49	15.55	13.81	178.22	-9,951.97	309.35	9,962.12	9,932.77	29.35	339.455		
4,500.00	4,500.00	4,277.45	4,275.78	15.91	14.77	178.17	-9,958.43	317.58	9,964.69	9,934.02	30.67	324.909		
4,600.00	4,600.00	4,423.56	4,421.86	16.27	15.28	178.16	-9,960.22	319.72	9,965.93	9,934.39	31.54	315.989		
4,700.00	4,700.00	4,501.04	4,499.33	16.62	15.55	178.16	-9,961.12	320.51	9,967.13	9,934.96	32.17	309.851		
4,800.00	4,800.00	4,618.02	4,616.30	16.98	15.96	178.15	-9,962.53	321.43	9,968.36	9,935.42	32.93	302.668		
4,900.00	4,900.00	4,722.90	4,721.17	17.34	16.33	178.15	-9,963.68	322.08	9,969.47	9,935.81	33.66	296.182		
5,000.00	5,000.00	4,822.68	4,820.95	17.70	16.68	178.15	-9,964.74	322.67	9,970.56	9,936.19	34.37	290.120		
5,100.00	5,100.00	4,918.60	4,916.85	18.06	17.02	178.14	-9,965.79	323.27	9,972.51	9,937.45	35.06	284.441		
5,200.00	5,199.96	5,017.37	5,015.62	18.41	17.36	178.13	-9,966.90	323.86	9,976.13	9,940.37	35.76	278.954		
5,300.00	5,299.86	5,115.74	5,113.97	18.77	17.71	178.12	-9,968.02	324.37	9,981.44	9,944.97	36.46	273.737		
5,400.00	5,399.68	5,220.93	5,219.16	19.13	18.07	178.11	-9,969.19	324.96	9,988.37	9,951.18	37.19	268.589		
5,500.00	5,499.37	5,320.60	5,318.82	19.49	18.42	178.09	-9,970.27	325.64	9,996.93	9,959.03	37.89	263.818		
11,800.00	11,618.96	11,600.29	11,597.12	41.27	40.42	177.30	-10,073.26	369.47	9,979.79	9,898.45	81.34	122.698		
11,850.00	11,633.37	11,613.85	11,610.68	41.37	40.46	177.28	-10,073.19	369.63	9,931.91	9,850.51	81.40	122.009		
11,900.00	11,643.55	11,623.35	11,620.19	41.48	40.50	177.27	-10,073.14	369.73	9,882.98	9,801.53	81.45	121.339		
11,950.00	11,649.43	11,628.74	11,625.57	41.58	40.51	177.25	-10,073.11	369.79	9,833.38	9,751.90	81.48	120.690		
11,988.78	11,650.99	11,630.04	11,626.88	41.67	40.52	177.24	-10,073.11	369.81	9,794.67	9,713.18	81.49	120.202		
12,000.00	11,651.07	11,630.06	11,626.89	41.69	40.52	177.24	-10,073.11	369.81	9,783.46	9,701.98	81.49	120.062		
12,100.00	11,651.72	11,630.18	11,627.01	41.96	40.52	177.21	-10,073.11	369.81	9,683.58	9,602.09	81.50	118.822		
12,200.00	11,652.37	11,630.31	11,627.14	42.28	40.52	177.18	-10,073.11	369.81	9,583.70	9,502.19	81.51	117.581		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - #89 - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
12,300.00	11,653.02	11,630.43	11,627.27	42.67	40.52	177.15	-10,073.10	369.81	9,483.82	9,402.30	81.52	116.338		
12,400.00	11,653.68	11,630.56	11,627.39	43.12	40.52	177.12	-10,073.10	369.81	9,383.95	9,302.42	81.53	115.093		
12,500.00	11,654.33	11,630.69	11,627.52	43.62	40.52	177.09	-10,073.10	369.81	9,284.08	9,202.53	81.55	113.847		
12,600.00	11,654.98	11,630.81	11,627.65	44.19	40.52	177.06	-10,073.10	369.81	9,184.21	9,102.64	81.57	112.600		
12,700.00	11,655.64	11,630.94	11,627.77	44.80	40.52	177.03	-10,073.10	369.82	9,084.34	9,002.76	81.58	111.351		
12,800.00	11,656.29	11,631.07	11,627.90	45.47	40.52	176.99	-10,073.10	369.82	8,984.48	8,902.87	81.60	110.101		
12,900.00	11,656.94	11,631.19	11,628.03	46.19	40.52	176.96	-10,073.10	369.82	8,884.62	8,802.99	81.62	108.849		
13,000.00	11,657.59	11,631.32	11,628.15	46.95	40.52	176.93	-10,073.10	369.82	8,784.76	8,703.11	81.65	107.597		
13,100.00	11,658.25	11,631.45	11,628.28	47.76	40.52	176.89	-10,073.10	369.82	8,684.90	8,603.24	81.67	106.343		
13,200.00	11,658.90	11,631.58	11,628.41	48.62	40.52	176.85	-10,073.10	369.82	8,585.05	8,503.36	81.69	105.088		
13,300.00	11,659.55	11,631.70	11,628.54	49.51	40.52	176.82	-10,073.10	369.82	8,485.21	8,403.49	81.72	103.832		
13,400.00	11,660.20	11,631.83	11,628.66	50.44	40.53	176.78	-10,073.10	369.83	8,385.36	8,303.61	81.75	102.575		
13,500.00	11,660.86	11,631.96	11,628.79	51.41	40.53	176.74	-10,073.10	369.83	8,285.52	8,203.74	81.78	101.317		
13,600.00	11,661.51	11,632.09	11,628.92	52.41	40.53	176.70	-10,073.10	369.83	8,185.69	8,103.88	81.81	100.058		
13,700.00	11,662.16	11,632.22	11,629.05	53.45	40.53	176.66	-10,073.10	369.83	8,085.85	8,004.01	81.84	98.798		
13,800.00	11,662.82	11,632.35	11,629.18	54.52	40.53	176.62	-10,073.09	369.83	7,986.03	7,904.15	81.88	97.537		
13,900.00	11,663.47	11,632.47	11,629.31	55.61	40.53	176.58	-10,073.09	369.83	7,886.20	7,804.29	81.91	96.276		
14,000.00	11,664.12	11,632.60	11,629.44	56.73	40.53	176.53	-10,073.09	369.83	7,786.38	7,704.43	81.95	95.013		
14,100.00	11,664.77	11,632.73	11,629.56	57.88	40.53	176.49	-10,073.09	369.84	7,686.57	7,604.58	81.99	93.750		
14,200.00	11,665.43	11,632.86	11,629.69	59.05	40.53	176.44	-10,073.09	369.84	7,586.76	7,504.73	82.03	92.486		
14,300.00	11,666.08	11,632.99	11,629.82	60.25	40.53	176.39	-10,073.09	369.84	7,486.96	7,404.88	82.07	91.221		
14,400.00	11,666.73	11,633.12	11,629.95	61.46	40.53	176.34	-10,073.09	369.84	7,387.16	7,305.04	82.12	89.956		
14,500.00	11,667.39	11,633.25	11,630.08	62.70	40.53	176.29	-10,073.09	369.84	7,287.36	7,205.20	82.17	88.690		
14,600.00	11,668.04	11,633.38	11,630.21	63.95	40.53	176.24	-10,073.09	369.84	7,187.58	7,105.36	82.22	87.424		
14,700.00	11,668.69	11,633.51	11,630.34	65.23	40.53	176.19	-10,073.09	369.84	7,087.79	7,005.53	82.27	86.157		
14,800.00	11,669.34	11,633.64	11,630.47	66.52	40.53	176.13	-10,073.09	369.84	6,988.02	6,905.70	82.32	84.890		
14,900.00	11,670.00	11,633.77	11,630.60	67.82	40.53	176.08	-10,073.09	369.85	6,888.25	6,805.88	82.37	83.622		
15,000.00	11,670.65	11,633.90	11,630.73	69.14	40.53	176.02	-10,073.09	369.85	6,788.49	6,706.06	82.43	82.353		
15,100.00	11,671.30	11,634.03	11,630.86	70.48	40.53	175.96	-10,073.09	369.85	6,688.73	6,606.24	82.49	81.085		
15,200.00	11,671.95	11,634.16	11,630.99	71.83	40.53	175.90	-10,073.09	369.85	6,588.98	6,506.43	82.55	79.816		
15,300.00	11,672.61	11,634.29	11,631.12	73.19	40.53	175.84	-10,073.08	369.85	6,489.24	6,406.63	82.62	78.546		
15,400.00	11,673.26	11,634.42	11,631.25	74.56	40.53	175.77	-10,073.08	369.85	6,389.51	6,306.83	82.68	77.277		
15,500.00	11,673.91	11,634.55	11,631.39	75.94	40.53	175.70	-10,073.08	369.85	6,289.79	6,207.04	82.75	76.007		
15,600.00	11,674.57	11,634.69	11,631.52	77.34	40.54	175.64	-10,073.08	369.86	6,190.08	6,107.25	82.83	74.736		
15,700.00	11,675.22	11,634.82	11,631.65	78.74	40.54	175.56	-10,073.08	369.86	6,090.37	6,007.47	82.90	73.466		
15,800.00	11,675.87	11,634.95	11,631.78	80.16	40.54	175.49	-10,073.08	369.86	5,990.67	5,907.70	82.98	72.195		
15,900.00	11,676.52	11,635.08	11,631.91	81.58	40.54	175.41	-10,073.08	369.86	5,890.99	5,807.93	83.06	70.924		
16,000.00	11,677.18	11,635.21	11,632.04	83.01	40.54	175.33	-10,073.08	369.86	5,791.32	5,708.17	83.14	69.653		
16,100.00	11,677.83	11,635.34	11,632.18	84.46	40.54	175.25	-10,073.08	369.86	5,691.65	5,608.42	83.23	68.382		
16,200.00	11,678.48	11,635.48	11,632.31	85.90	40.54	175.17	-10,073.08	369.86	5,592.00	5,508.68	83.32	67.111		
16,300.00	11,679.13	11,635.61	11,632.44	87.36	40.54	175.08	-10,073.08	369.87	5,492.37	5,408.95	83.42	65.840		
16,400.00	11,679.79	11,635.74	11,632.57	88.82	40.54	174.99	-10,073.08	369.87	5,392.74	5,309.22	83.52	64.568		
16,500.00	11,680.44	11,635.87	11,632.71	90.29	40.54	174.89	-10,073.08	369.87	5,293.13	5,209.51	83.62	63.297		
16,600.00	11,681.09	11,636.01	11,632.84	91.77	40.54	174.80	-10,073.08	369.87	5,193.54	5,109.80	83.73	62.025		
16,700.00	11,681.75	11,636.14	11,632.97	93.25	40.54	174.69	-10,073.07	369.87	5,093.96	5,010.11	83.85	60.754		
16,800.00	11,682.40	11,636.27	11,633.11	94.74	40.54	174.59	-10,073.07	369.87	4,994.39	4,910.43	83.97	59.482		
16,900.00	11,683.05	11,636.41	11,633.24	96.23	40.54	174.48	-10,073.07	369.87	4,894.85	4,810.76	84.09	58.210		
17,000.00	11,683.70	11,636.54	11,633.37	97.73	40.54	174.36	-10,073.07	369.88	4,795.32	4,711.10	84.22	56.938		
17,100.00	11,684.36	11,636.68	11,633.51	99.23	40.54	174.24	-10,073.07	369.88	4,695.82	4,611.46	84.36	55.666		
17,200.00	11,685.01	11,636.81	11,633.64	100.74	40.54	174.12	-10,073.07	369.88	4,596.33	4,511.83	84.50	54.394		
17,300.00	11,685.66	11,636.94	11,633.78	102.25	40.54	173.99	-10,073.07	369.88	4,496.87	4,412.22	84.65	53.122		
17,400.00	11,686.32	11,637.08	11,633.91	103.77	40.54	173.85	-10,073.07	369.88	4,397.44	4,312.62	84.81	51.849		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - #89 - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
17,500.00	11,686.97	11,637.21	11,634.04	105.29	40.54	173.71	-10,073.07	369.88	4,298.02	4,213.04	84.98	50.577		
17,600.00	11,687.62	11,637.35	11,634.18	106.81	40.54	173.56	-10,073.07	369.88	4,198.64	4,113.48	85.16	49.304		
17,700.00	11,688.27	11,637.48	11,634.31	108.34	40.54	173.40	-10,073.07	369.89	4,099.29	4,013.94	85.35	48.032		
17,800.00	11,688.93	11,637.62	11,634.45	109.88	40.55	173.24	-10,073.07	369.89	3,999.97	3,914.42	85.54	46.759		
17,900.00	11,689.58	11,637.75	11,634.58	111.41	40.55	173.06	-10,073.07	369.89	3,900.68	3,814.93	85.76	45.485		
18,000.00	11,690.23	11,637.89	11,634.72	112.95	40.55	172.88	-10,073.07	369.89	3,801.43	3,715.45	85.98	44.212		
18,100.00	11,690.88	11,638.02	11,634.85	114.49	40.55	172.69	-10,073.07	369.89	3,702.23	3,616.00	86.22	42.938		
18,200.00	11,691.54	11,638.16	11,634.99	116.04	40.55	172.49	-10,073.06	369.89	3,603.06	3,516.58	86.48	41.664		
18,300.00	11,692.19	11,638.29	11,635.13	117.59	40.55	172.27	-10,073.06	369.89	3,503.95	3,417.19	86.75	40.389		
18,400.00	11,692.84	11,638.43	11,635.26	119.14	40.55	172.05	-10,073.06	369.90	3,404.88	3,317.83	87.05	39.114		
18,500.00	11,693.50	11,638.57	11,635.40	120.70	40.55	171.81	-10,073.06	369.90	3,305.87	3,218.50	87.37	37.838		
18,600.00	11,694.15	11,638.70	11,635.53	122.25	40.55	171.55	-10,073.06	369.90	3,206.92	3,119.21	87.71	36.562		
18,700.00	11,694.80	11,638.84	11,635.67	123.81	40.55	171.28	-10,073.06	369.90	3,108.05	3,019.96	88.08	35.286		
18,800.00	11,695.45	11,638.98	11,635.81	125.37	40.55	170.99	-10,073.06	369.90	3,009.24	2,920.75	88.49	34.008		
18,900.00	11,696.11	11,639.11	11,635.94	126.94	40.55	170.68	-10,073.06	369.90	2,910.52	2,821.59	88.92	32.730		
19,000.00	11,696.76	11,639.25	11,636.08	128.51	40.55	170.35	-10,073.06	369.90	2,811.88	2,722.48	89.40	31.452		
19,100.00	11,697.41	11,639.39	11,636.22	130.08	40.55	170.00	-10,073.06	369.90	2,713.35	2,623.42	89.93	30.173		
19,200.00	11,698.07	11,639.52	11,636.36	131.65	40.55	169.62	-10,073.06	369.91	2,614.92	2,524.42	90.50	28.893		
19,300.00	11,698.72	11,639.66	11,636.49	133.22	40.55	169.21	-10,073.06	369.91	2,516.63	2,425.49	91.14	27.613		
19,400.00	11,699.37	11,639.80	11,636.63	134.80	40.55	168.77	-10,073.06	369.91	2,418.47	2,326.63	91.84	26.333		
19,500.00	11,700.02	11,639.94	11,636.77	136.37	40.55	168.28	-10,073.06	369.91	2,320.47	2,227.84	92.62	25.053		
19,600.00	11,700.68	11,640.08	11,636.91	137.95	40.55	167.76	-10,073.05	369.91	2,222.64	2,129.15	93.49	23.773		
19,700.00	11,701.33	11,640.21	11,637.05	139.53	40.55	167.19	-10,073.05	369.91	2,125.02	2,030.55	94.47	22.494		
19,800.00	11,701.98	11,640.35	11,637.18	141.11	40.55	166.56	-10,073.05	369.91	2,027.63	1,932.07	95.57	21.217		
19,900.00	11,702.63	11,640.49	11,637.32	142.70	40.56	165.87	-10,073.05	369.92	1,930.51	1,833.70	96.81	19.942		
20,000.00	11,703.29	11,640.63	11,637.46	144.28	40.56	165.11	-10,073.05	369.92	1,833.70	1,735.48	98.22	18.670		
20,100.00	11,703.94	11,640.77	11,637.60	145.87	40.56	164.26	-10,073.05	369.92	1,737.25	1,637.42	99.82	17.403		
20,200.00	11,704.59	11,640.91	11,637.74	147.46	40.56	163.32	-10,073.05	369.92	1,641.22	1,539.55	101.67	16.143		
20,300.00	11,705.25	11,641.05	11,637.88	149.05	40.56	162.25	-10,073.05	369.92	1,545.70	1,441.90	103.80	14.892		
20,400.00	11,705.90	11,641.19	11,638.02	150.64	40.56	161.05	-10,073.05	369.92	1,450.78	1,344.52	106.26	13.653		
20,500.00	11,706.55	11,641.33	11,638.16	152.24	40.56	159.68	-10,073.05	369.92	1,356.59	1,247.45	109.14	12.430		
20,600.00	11,707.20	11,641.47	11,638.30	153.83	40.56	158.10	-10,073.05	369.93	1,263.29	1,150.78	112.51	11.228		
20,700.00	11,707.86	11,641.61	11,638.44	155.43	40.56	156.28	-10,073.05	369.93	1,171.10	1,054.62	116.49	10.054		
20,800.00	11,708.51	11,641.75	11,638.58	157.02	40.56	154.14	-10,073.05	369.93	1,080.31	959.10	121.20	8.913		
20,900.00	11,709.16	11,641.89	11,638.72	158.62	40.56	151.62	-10,073.05	369.93	991.28	864.46	126.82	7.816		
21,000.00	11,709.82	11,642.03	11,638.86	160.22	40.56	148.61	-10,073.04	369.93	904.55	771.01	133.54	6.774		
21,100.00	11,710.47	11,642.17	11,639.00	161.82	40.56	144.97	-10,073.04	369.93	820.85	679.27	141.57	5.798		
21,200.00	11,711.12	11,642.31	11,639.14	163.42	40.56	140.53	-10,073.04	369.94	741.19	590.06	151.13	4.904		
21,300.00	11,711.77	11,642.45	11,639.28	165.03	40.56	135.06	-10,073.04	369.94	667.04	504.69	162.35	4.109		
21,400.00	11,712.43	11,642.59	11,639.42	166.63	40.56	128.30	-10,073.04	369.94	600.43	425.36	175.07	3.430		
21,500.00	11,713.08	11,642.73	11,639.56	168.23	40.56	120.01	-10,073.04	369.94	544.15	355.56	188.59	2.885		
21,600.00	11,713.73	11,642.87	11,639.71	169.84	40.56	110.07	-10,073.04	369.94	501.67	300.45	201.22	2.493		
21,656.46	11,714.10	11,642.95	11,639.79	170.75	40.56	103.79	-10,073.04	369.94	485.20	278.25	206.96	2.344	CC, ES, SF	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - #89 - Wellbore #2 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS, 12591-MWD, 13985-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
0.00	0.00	0.00	0.00	0.00	0.00	178.60	-9,912.81	242.43	9,916.03					
100.00	100.00	28.91	28.91	0.13	0.04	178.60	-9,912.81	242.44	9,915.78	9,915.61	0.17	N/A		
200.00	200.00	119.18	119.18	0.49	0.20	178.60	-9,912.84	242.55	9,915.81	9,915.12	0.69	N/A		
300.00	300.00	191.57	191.57	0.85	0.45	178.60	-9,913.02	242.74	9,916.06	9,914.76	1.30	7,612.401		
400.00	400.00	331.39	331.39	1.21	0.94	178.60	-9,913.24	242.95	9,916.22	9,914.07	2.15	4,614.762		
478.68	478.68	409.54	409.53	1.49	1.21	178.59	-9,913.23	243.17	9,916.21	9,913.50	2.70	3,667.896		
500.00	500.00	426.10	426.09	1.57	1.27	178.59	-9,913.23	243.23	9,916.21	9,913.38	2.84	3,494.338		
600.00	600.00	500.00	500.00	1.93	1.53	178.59	-9,913.30	243.48	9,916.34	9,912.88	3.45	2,870.684		
700.00	700.00	549.09	549.09	2.29	1.70	178.59	-9,913.54	243.53	9,916.86	9,912.88	3.98	2,488.966		
800.00	800.00	600.00	599.99	2.64	1.88	178.59	-9,914.13	243.38	9,917.97	9,913.45	4.52	2,193.990		
900.00	900.00	641.48	641.46	3.00	2.03	178.60	-9,914.84	243.12	9,919.61	9,914.58	5.02	1,974.378		
1,000.00	1,000.00	700.00	699.97	3.36	2.23	178.60	-9,916.14	242.56	9,921.77	9,916.18	5.59	1,775.753		
1,100.00	1,100.00	779.70	779.64	3.72	2.52	178.60	-9,918.16	241.64	9,924.26	9,918.03	6.23	1,594.172		
1,200.00	1,200.00	896.68	896.57	4.08	2.93	178.61	-9,921.06	240.32	9,926.72	9,919.72	6.99	1,419.254		
1,300.00	1,300.00	1,036.87	1,036.73	4.44	3.42	178.62	-9,924.12	239.09	9,928.88	9,921.03	7.84	1,265.728		
1,400.00	1,400.00	1,173.56	1,173.39	4.79	3.90	178.62	-9,926.51	238.62	9,930.61	9,921.93	8.68	1,143.838		
1,500.00	1,500.00	1,281.86	1,281.68	5.15	4.28	178.62	-9,928.15	238.69	9,932.13	9,922.71	9.42	1,054.405		
1,600.00	1,600.00	1,382.67	1,382.48	5.51	4.63	178.62	-9,929.65	238.86	9,933.61	9,923.48	10.13	980.491		
1,700.00	1,700.00	1,563.41	1,563.21	5.87	5.26	178.62	-9,931.34	239.95	9,934.46	9,923.34	11.12	893.187		
1,800.00	1,800.00	1,721.79	1,721.57	6.23	5.81	178.60	-9,931.92	242.38	9,934.88	9,922.85	12.03	825.525		
1,900.00	1,900.00	1,812.74	1,812.49	6.59	6.13	178.59	-9,932.01	244.29	9,935.03	9,922.32	12.71	781.592		
2,000.00	2,000.00	1,933.89	1,933.61	6.95	6.56	178.57	-9,931.98	247.31	9,935.06	9,921.56	13.49	736.263		
2,076.86	2,076.86	2,007.23	2,006.93	7.22	6.81	178.56	-9,931.92	249.13	9,935.04	9,921.02	14.03	708.318		
2,100.00	2,100.00	2,025.15	2,024.84	7.30	6.88	178.56	-9,931.91	249.57	9,935.05	9,920.88	14.17	701.036		
2,200.00	2,200.00	2,110.47	2,110.13	7.66	7.17	178.55	-9,931.98	251.72	9,935.19	9,920.36	14.83	669.974		
2,300.00	2,300.00	2,224.15	2,223.77	8.02	7.57	178.53	-9,932.02	254.77	9,935.29	9,919.70	15.59	637.459		
2,400.00	2,400.00	2,311.34	2,310.94	8.38	7.88	178.52	-9,932.06	257.04	9,935.40	9,919.15	16.25	611.425		
2,500.00	2,500.00	2,385.07	2,384.64	8.74	8.14	178.51	-9,932.25	258.95	9,935.73	9,918.86	16.87	589.090		
2,600.00	2,600.00	2,481.76	2,481.29	9.10	8.47	178.49	-9,932.66	261.46	9,936.22	9,918.66	17.56	565.741		
2,700.00	2,700.00	2,561.37	2,560.88	9.45	8.75	178.48	-9,933.06	263.38	9,936.79	9,918.59	18.20	545.971		
2,800.00	2,800.00	2,635.23	2,634.72	9.81	9.01	178.47	-9,933.63	264.98	9,937.62	9,918.80	18.82	528.121		
2,900.00	2,900.00	2,713.74	2,713.21	10.17	9.29	178.46	-9,934.44	266.73	9,938.71	9,919.26	19.45	510.991		
3,000.00	3,000.00	2,818.35	2,817.79	10.53	9.65	178.45	-9,935.52	269.06	9,939.80	9,919.62	20.17	492.691		
3,100.00	3,100.00	2,880.91	2,880.32	10.89	9.87	178.44	-9,936.31	270.45	9,941.11	9,920.36	20.75	479.059		
3,200.00	3,200.00	2,970.56	2,969.95	11.25	10.19	178.43	-9,937.69	272.41	9,942.71	9,921.29	21.42	464.105		
3,300.00	3,300.00	3,300.00	3,146.82	11.61	11.34	178.41	-9,939.96	276.38	9,944.15	9,921.22	22.94	433.550		
3,400.00	3,400.00	3,326.00	3,325.20	11.96	11.43	178.37	-9,940.39	282.61	9,944.41	9,921.02	23.39	425.215		
3,500.00	3,500.00	3,400.00	3,399.16	12.32	11.69	178.36	-9,940.35	285.22	9,944.49	9,920.48	24.00	414.271		
3,600.00	3,600.00	3,459.55	3,458.67	12.68	11.90	178.34	-9,940.52	287.25	9,944.92	9,920.35	24.57	404.728		
3,700.00	3,700.00	3,509.73	3,508.83	13.04	12.08	178.33	-9,940.96	288.99	9,945.90	9,920.80	25.11	396.161		
3,800.00	3,800.00	3,579.15	3,578.20	13.40	12.32	178.32	-9,941.84	291.46	9,947.27	9,921.57	25.71	386.946		
3,900.00	3,900.00	3,645.15	3,644.14	13.76	12.55	178.31	-9,942.88	293.97	9,948.96	9,922.67	26.30	378.337		
4,000.00	4,000.00	3,712.23	3,711.14	14.11	12.79	178.29	-9,944.17	296.89	9,951.01	9,924.12	26.89	370.067		
4,100.00	4,100.00	3,793.87	3,792.68	14.47	13.07	178.27	-9,945.93	300.59	9,953.30	9,925.76	27.53	361.479		
4,200.00	4,200.00	3,852.60	3,851.34	14.83	13.28	178.25	-9,947.36	303.17	9,955.88	9,927.78	28.10	354.328		
4,300.00	4,300.00	3,914.83	3,913.49	15.19	13.50	178.24	-9,949.17	305.73	9,958.89	9,930.22	28.67	347.328		
4,400.00	4,400.00	4,004.95	4,003.49	15.55	13.81	178.22	-9,951.97	309.35	9,962.12	9,932.77	29.35	339.455		
4,500.00	4,500.00	4,277.45	4,275.78	15.91	14.77	178.17	-9,958.43	317.58	9,964.69	9,934.02	30.67	324.909		
4,600.00	4,600.00	4,423.56	4,421.86	16.27	15.28	178.16	-9,960.22	319.72	9,965.93	9,934.39	31.54	315.989		
4,700.00	4,700.00	4,501.04	4,499.33	16.62	15.55	178.16	-9,961.12	320.51	9,967.13	9,934.96	32.17	309.851		
4,800.00	4,800.00	4,618.02	4,616.30	16.98	15.96	178.15	-9,962.53	321.43	9,968.36	9,935.42	32.93	302.668		
4,900.00	4,900.00	4,722.90	4,721.17	17.34	16.33	178.15	-9,963.68	322.08	9,969.47	9,935.81	33.66	296.182		

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Well Error: 0.00 usft
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Local Co-ordinate Reference: Well 518H
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Survey Program: 100-GYRO-NS, 12591-MWD, 13985-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
5,000.00	5,000.00	4,822.68	4,820.95	17.70	16.68	178.15	-9,964.74	322.67	9,970.56	9,936.19	34.37	290.120	
5,100.00	5,100.00	4,918.60	4,916.85	18.06	17.02	178.14	-9,965.79	323.27	9,972.51	9,937.45	35.06	284.441	
5,200.00	5,199.96	5,017.37	5,015.62	18.41	17.36	178.13	-9,966.90	323.86	9,976.13	9,940.37	35.76	278.954	
5,300.00	5,299.86	5,115.74	5,113.97	18.77	17.71	178.12	-9,968.02	324.37	9,981.44	9,944.97	36.46	273.737	
5,400.00	5,399.68	5,220.93	5,219.16	19.13	18.07	178.11	-9,969.19	324.96	9,988.37	9,951.18	37.19	268.589	
5,500.00	5,499.37	5,320.60	5,318.82	19.49	18.42	178.09	-9,970.27	325.64	9,996.93	9,959.03	37.89	263.818	
11,800.00	11,618.96	11,600.29	11,597.12	41.27	40.42	177.30	-10,073.26	369.47	9,979.79	9,898.45	81.34	122.698	
11,850.00	11,633.37	11,613.85	11,610.68	41.37	40.46	177.28	-10,073.19	369.63	9,931.91	9,850.51	81.40	122.009	
11,900.00	11,643.55	11,623.35	11,620.19	41.48	40.50	177.27	-10,073.14	369.73	9,882.98	9,801.53	81.45	121.339	
11,950.00	11,649.43	11,628.74	11,625.57	41.58	40.51	177.25	-10,073.11	369.79	9,833.38	9,751.90	81.48	120.690	
11,988.78	11,650.99	11,630.04	11,626.88	41.67	40.52	177.24	-10,073.11	369.81	9,794.67	9,713.18	81.49	120.202	
12,000.00	11,651.07	11,630.06	11,626.89	41.69	40.52	177.24	-10,073.11	369.81	9,783.46	9,701.98	81.49	120.062	
12,100.00	11,651.72	11,630.18	11,627.01	41.96	40.52	177.21	-10,073.11	369.81	9,683.58	9,602.09	81.50	118.822	
12,200.00	11,652.37	11,630.31	11,627.14	42.28	40.52	177.18	-10,073.11	369.81	9,583.70	9,502.19	81.51	117.581	
12,300.00	11,653.02	11,630.43	11,627.27	42.67	40.52	177.15	-10,073.10	369.81	9,483.82	9,402.30	81.52	116.338	
12,400.00	11,653.68	11,630.56	11,627.39	43.12	40.52	177.12	-10,073.10	369.81	9,383.95	9,302.42	81.53	115.093	
12,500.00	11,654.33	11,630.69	11,627.52	43.62	40.52	177.09	-10,073.10	369.81	9,284.08	9,202.53	81.55	113.847	
12,600.00	11,654.98	11,630.81	11,627.65	44.19	40.52	177.06	-10,073.10	369.81	9,184.21	9,102.64	81.57	112.600	
12,700.00	11,655.64	11,630.94	11,627.77	44.80	40.52	177.03	-10,073.10	369.82	9,084.34	9,002.76	81.58	111.351	
12,800.00	11,656.29	11,631.07	11,627.90	45.47	40.52	176.99	-10,073.10	369.82	8,984.48	8,902.87	81.60	110.101	
12,900.00	11,656.94	11,631.19	11,628.03	46.19	40.52	176.96	-10,073.10	369.82	8,884.62	8,802.99	81.62	108.849	
13,000.00	11,657.59	11,631.32	11,628.15	46.95	40.52	176.93	-10,073.10	369.82	8,784.76	8,703.11	81.65	107.597	
13,100.00	11,658.25	11,631.45	11,628.28	47.76	40.52	176.89	-10,073.10	369.82	8,684.90	8,603.24	81.67	106.343	
13,200.00	11,658.90	11,631.58	11,628.41	48.62	40.52	176.85	-10,073.10	369.82	8,585.05	8,503.36	81.69	105.088	
13,300.00	11,659.55	11,631.70	11,628.54	49.51	40.52	176.82	-10,073.10	369.82	8,485.21	8,403.49	81.72	103.832	
13,400.00	11,660.20	11,631.83	11,628.66	50.44	40.53	176.78	-10,073.10	369.83	8,385.36	8,303.61	81.75	102.575	
13,500.00	11,660.86	11,631.96	11,628.79	51.41	40.53	176.74	-10,073.10	369.83	8,285.52	8,203.74	81.78	101.317	
13,600.00	11,661.51	11,632.09	11,628.92	52.41	40.53	176.70	-10,073.10	369.83	8,185.69	8,103.88	81.81	100.058	
13,700.00	11,662.16	11,632.22	11,629.05	53.45	40.53	176.66	-10,073.10	369.83	8,085.85	8,004.01	81.84	98.798	
13,800.00	11,662.82	11,632.35	11,629.18	54.52	40.53	176.62	-10,073.09	369.83	7,986.03	7,904.15	81.88	97.537	
13,900.00	11,663.47	11,632.47	11,629.31	55.61	40.53	176.58	-10,073.09	369.83	7,886.20	7,804.29	81.91	96.276	
14,000.00	11,664.12	11,632.60	11,629.44	56.73	40.53	176.53	-10,073.09	369.83	7,786.38	7,704.43	81.95	95.013	
14,100.00	11,664.77	11,632.73	11,629.56	57.88	40.53	176.49	-10,073.09	369.84	7,686.57	7,604.58	81.99	93.750	
14,200.00	11,665.43	11,632.86	11,629.69	59.05	40.53	176.44	-10,073.09	369.84	7,586.76	7,504.73	82.03	92.486	
14,300.00	11,666.08	11,632.99	11,629.82	60.25	40.53	176.39	-10,073.09	369.84	7,486.96	7,404.88	82.07	91.221	
14,400.00	11,666.73	11,633.12	11,629.95	61.46	40.53	176.34	-10,073.09	369.84	7,387.16	7,305.04	82.12	89.956	
14,500.00	11,667.39	11,633.25	11,630.08	62.70	40.53	176.29	-10,073.09	369.84	7,287.36	7,205.20	82.17	88.690	
14,600.00	11,668.04	11,633.38	11,630.21	63.95	40.53	176.24	-10,073.09	369.84	7,187.58	7,105.36	82.22	87.424	
14,700.00	11,668.69	11,633.51	11,630.34	65.23	40.53	176.19	-10,073.09	369.84	7,087.79	7,005.53	82.27	86.157	
14,800.00	11,669.34	11,633.64	11,630.47	66.52	40.53	176.13	-10,073.09	369.84	6,988.02	6,905.70	82.32	84.890	
14,900.00	11,670.00	11,633.77	11,630.60	67.82	40.53	176.08	-10,073.09	369.85	6,888.25	6,805.88	82.37	83.622	
15,000.00	11,670.65	11,633.90	11,630.73	69.14	40.53	176.02	-10,073.09	369.85	6,788.49	6,706.06	82.43	82.353	
15,100.00	11,671.30	11,634.03	11,630.86	70.48	40.53	175.96	-10,073.09	369.85	6,688.73	6,606.24	82.49	81.085	
15,200.00	11,671.95	11,634.16	11,630.99	71.83	40.53	175.90	-10,073.09	369.85	6,588.98	6,506.43	82.55	79.816	
15,300.00	11,672.61	11,634.29	11,631.12	73.19	40.53	175.84	-10,073.08	369.85	6,489.24	6,406.63	82.62	78.546	
15,400.00	11,673.26	11,634.42	11,631.25	74.56	40.53	175.77	-10,073.08	369.85	6,389.51	6,306.83	82.68	77.277	
15,500.00	11,673.91	11,634.55	11,631.39	75.94	40.53	175.70	-10,073.08	369.85	6,289.79	6,207.04	82.75	76.007	
15,600.00	11,674.57	11,634.69	11,631.52	77.34	40.54	175.64	-10,073.08	369.86	6,190.08	6,107.25	82.83	74.736	
15,700.00	11,675.22	11,634.82	11,631.65	78.74	40.54	175.56	-10,073.08	369.86	6,090.37	6,007.47	82.90	73.466	
15,800.00	11,675.87	11,634.95	11,631.78	80.16	40.54	175.49	-10,073.08	369.86	5,990.67	5,907.70	82.98	72.195	
15,900.00	11,676.52	11,635.08	11,631.91	81.58	40.54	175.41	-10,073.08	369.86	5,890.99	5,807.93	83.06	70.924	
16,000.00	11,677.18	11,635.21	11,632.04	83.01	40.54	175.33	-10,073.08	369.86	5,791.32	5,708.17	83.14	69.653	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - #89 - Wellbore #2 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS, 12591-MWD, 13985-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
16,100.00	11,677.83	11,635.34	11,632.18	84.46	40.54	175.25	-10,073.08	369.86	5,691.65	5,608.42	83.23	68.382			
16,200.00	11,678.48	11,635.48	11,632.31	85.90	40.54	175.17	-10,073.08	369.86	5,592.00	5,508.68	83.32	67.111			
16,300.00	11,679.13	11,635.61	11,632.44	87.36	40.54	175.08	-10,073.08	369.87	5,492.37	5,408.95	83.42	65.840			
16,400.00	11,679.79	11,635.74	11,632.57	88.82	40.54	174.99	-10,073.08	369.87	5,392.74	5,309.22	83.52	64.568			
16,500.00	11,680.44	11,635.87	11,632.71	90.29	40.54	174.89	-10,073.08	369.87	5,293.13	5,209.51	83.62	63.297			
16,600.00	11,681.09	11,636.01	11,632.84	91.77	40.54	174.80	-10,073.08	369.87	5,193.54	5,109.80	83.73	62.025			
16,700.00	11,681.75	11,636.14	11,632.97	93.25	40.54	174.69	-10,073.07	369.87	5,093.96	5,010.11	83.85	60.754			
16,800.00	11,682.40	11,636.27	11,633.11	94.74	40.54	174.59	-10,073.07	369.87	4,994.39	4,910.43	83.97	59.482			
16,900.00	11,683.05	11,636.41	11,633.24	96.23	40.54	174.48	-10,073.07	369.87	4,894.85	4,810.76	84.09	58.210			
17,000.00	11,683.70	11,636.54	11,633.37	97.73	40.54	174.36	-10,073.07	369.88	4,795.32	4,711.10	84.22	56.938			
17,100.00	11,684.36	11,636.68	11,633.51	99.23	40.54	174.24	-10,073.07	369.88	4,695.82	4,611.46	84.36	55.666			
17,200.00	11,685.01	11,636.81	11,633.64	100.74	40.54	174.12	-10,073.07	369.88	4,596.33	4,511.83	84.50	54.394			
17,300.00	11,685.66	11,636.94	11,633.78	102.25	40.54	173.99	-10,073.07	369.88	4,496.87	4,412.22	84.65	53.122			
17,400.00	11,686.32	11,637.08	11,633.91	103.77	40.54	173.85	-10,073.07	369.88	4,397.44	4,312.62	84.81	51.849			
17,500.00	11,686.97	11,637.21	11,634.04	105.29	40.54	173.71	-10,073.07	369.88	4,298.02	4,213.04	84.98	50.577			
17,600.00	11,687.62	11,637.35	11,634.18	106.81	40.54	173.56	-10,073.07	369.88	4,198.64	4,113.48	85.16	49.304			
17,700.00	11,688.27	11,637.48	11,634.31	108.34	40.54	173.40	-10,073.07	369.89	4,099.29	4,013.94	85.35	48.032			
17,800.00	11,688.93	11,637.62	11,634.45	109.88	40.55	173.24	-10,073.07	369.89	3,999.97	3,914.42	85.54	46.759			
17,900.00	11,689.58	11,637.75	11,634.58	111.41	40.55	173.06	-10,073.07	369.89	3,900.68	3,814.93	85.76	45.485			
18,000.00	11,690.23	11,637.89	11,634.72	112.95	40.55	172.88	-10,073.07	369.89	3,801.43	3,715.45	85.98	44.212			
18,100.00	11,690.88	11,638.02	11,634.85	114.49	40.55	172.69	-10,073.07	369.89	3,702.23	3,616.00	86.22	42.938			
18,200.00	11,691.54	11,638.16	11,634.99	116.04	40.55	172.49	-10,073.06	369.89	3,603.06	3,516.58	86.48	41.664			
18,300.00	11,692.19	11,638.29	11,635.13	117.59	40.55	172.27	-10,073.06	369.89	3,503.95	3,417.19	86.75	40.389			
18,400.00	11,692.84	11,638.43	11,635.26	119.14	40.55	172.05	-10,073.06	369.90	3,404.88	3,317.83	87.05	39.114			
18,500.00	11,693.50	11,638.57	11,635.40	120.70	40.55	171.81	-10,073.06	369.90	3,305.87	3,218.50	87.37	37.838			
18,600.00	11,694.15	11,638.70	11,635.53	122.25	40.55	171.55	-10,073.06	369.90	3,206.92	3,119.21	87.71	36.562			
18,700.00	11,694.80	11,638.84	11,635.67	123.81	40.55	171.28	-10,073.06	369.90	3,108.05	3,019.96	88.08	35.286			
18,800.00	11,695.45	11,638.98	11,635.81	125.37	40.55	170.99	-10,073.06	369.90	3,009.24	2,920.75	88.49	34.008			
18,900.00	11,696.11	11,639.11	11,635.94	126.94	40.55	170.68	-10,073.06	369.90	2,910.52	2,821.59	88.92	32.730			
19,000.00	11,696.76	11,639.25	11,636.08	128.51	40.55	170.35	-10,073.06	369.90	2,811.88	2,722.48	89.40	31.452			
19,100.00	11,697.41	11,639.39	11,636.22	130.08	40.55	170.00	-10,073.06	369.90	2,713.35	2,623.42	89.93	30.173			
19,200.00	11,698.07	11,639.52	11,636.36	131.65	40.55	169.62	-10,073.06	369.91	2,614.92	2,524.42	90.50	28.893			
19,300.00	11,698.72	11,639.66	11,636.49	133.22	40.55	169.21	-10,073.06	369.91	2,516.63	2,425.49	91.14	27.613			
19,400.00	11,699.37	11,639.80	11,636.63	134.80	40.55	168.77	-10,073.06	369.91	2,418.47	2,326.63	91.84	26.333			
19,500.00	11,700.02	11,639.94	11,636.77	136.37	40.55	168.28	-10,073.06	369.91	2,320.47	2,227.84	92.62	25.053			
19,600.00	11,700.68	11,640.08	11,636.91	137.95	40.55	167.76	-10,073.05	369.91	2,222.64	2,129.15	93.49	23.773			
19,700.00	11,701.33	11,640.21	11,637.05	139.53	40.55	167.19	-10,073.05	369.91	2,125.02	2,030.55	94.47	22.494			
19,800.00	11,701.98	11,640.35	11,637.18	141.11	40.55	166.56	-10,073.05	369.91	2,027.63	1,932.07	95.57	21.217			
19,900.00	11,702.63	11,640.49	11,637.32	142.70	40.56	165.87	-10,073.05	369.92	1,930.51	1,833.70	96.81	19.942			
20,000.00	11,703.29	11,640.63	11,637.46	144.28	40.56	165.11	-10,073.05	369.92	1,833.70	1,735.48	98.22	18.670			
20,100.00	11,703.94	11,640.77	11,637.60	145.87	40.56	164.26	-10,073.05	369.92	1,737.25	1,637.42	99.82	17.403			
20,200.00	11,704.59	11,640.91	11,637.74	147.46	40.56	163.32	-10,073.05	369.92	1,641.22	1,539.55	101.67	16.143			
20,300.00	11,705.25	11,641.05	11,637.88	149.05	40.56	162.25	-10,073.05	369.92	1,545.70	1,441.90	103.80	14.892			
20,400.00	11,705.90	11,641.19	11,638.02	150.64	40.56	161.05	-10,073.05	369.92	1,450.78	1,344.52	106.26	13.653			
20,500.00	11,706.55	11,641.33	11,638.16	152.24	40.56	159.68	-10,073.05	369.92	1,356.59	1,247.45	109.14	12.430			
20,600.00	11,707.20	11,641.47	11,638.30	153.83	40.56	158.10	-10,073.05	369.93	1,263.29	1,150.78	112.51	11.228			
20,700.00	11,707.86	11,641.61	11,638.44	155.43	40.56	156.28	-10,073.05	369.93	1,171.10	1,054.62	116.49	10.054			
20,800.00	11,708.51	11,641.75	11,638.58	157.02	40.56	154.14	-10,073.05	369.93	1,080.31	959.10	121.20	8.913			
20,900.00	11,709.16	11,641.89	11,638.72	158.62	40.56	151.62	-10,073.05	369.93	991.28	864.46	126.82	7.816			
21,000.00	11,709.82	11,642.03	11,638.86	160.22	40.56	148.61	-10,073.04	369.93	904.55	771.01	133.54	6.774			
21,100.00	11,710.47	11,642.17	11,639.00	161.82	40.56	144.97	-10,073.04	369.93	820.85	679.27	141.57	5.798			
21,200.00	11,711.12	11,642.31	11,639.14	163.42	40.56	140.53	-10,073.04	369.94	741.19	590.06	151.13	4.904			

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - #89 - Wellbore #2 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS, 12591-MWD, 13985-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
21,300.00	11,711.77	11,642.45	11,639.28	165.03	40.56	135.06	-10,073.04	369.94	667.04	504.69	162.35	4.109		
21,400.00	11,712.43	11,642.59	11,639.42	166.63	40.56	128.30	-10,073.04	369.94	600.43	425.36	175.07	3.430		
21,500.00	11,713.08	11,642.73	11,639.56	168.23	40.56	120.01	-10,073.04	369.94	544.15	355.56	188.59	2.885		
21,600.00	11,713.73	11,642.87	11,639.71	169.84	40.56	110.07	-10,073.04	369.94	501.67	300.45	201.22	2.493		
21,656.46	11,714.10	11,642.95	11,639.79	170.75	40.56	103.79	-10,073.04	369.94	485.20	278.25	206.96	2.344	CC, ES, SF	



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 153H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS, 7564-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	177.61	-5,057.87	210.99	5,062.51				
100.00	100.00	43.02	43.02	0.13	0.06	177.61	-5,057.90	211.01	5,062.30	5,062.11	0.20	N/A	
200.00	200.00	132.34	132.34	0.49	0.26	177.61	-5,058.14	211.13	5,062.58	5,061.83	0.75	6,765.546	
300.00	300.00	234.53	234.53	0.85	0.61	177.61	-5,058.51	211.33	5,062.95	5,061.48	1.46	3,456.772	
400.00	400.00	346.06	346.06	1.21	1.00	177.61	-5,058.72	211.16	5,063.13	5,060.91	2.21	2,287.852	
500.00	500.00	447.79	447.79	1.57	1.36	177.62	-5,058.79	210.47	5,063.17	5,060.24	2.93	1,729.900	
600.00	600.00	546.28	546.28	1.93	1.70	177.62	-5,058.89	209.82	5,063.24	5,059.61	3.63	1,395.131	
700.00	700.00	644.27	644.26	2.29	2.05	177.63	-5,059.00	209.25	5,063.32	5,059.00	4.33	1,169.412	
800.00	800.00	739.56	739.55	2.64	2.38	177.64	-5,059.19	208.58	5,063.50	5,058.48	5.02	1,008.437	
900.00	900.00	838.48	838.47	3.00	2.73	177.65	-5,059.45	207.76	5,063.73	5,058.01	5.73	884.445	
1,000.00	1,000.00	937.15	937.13	3.36	3.07	177.66	-5,059.72	206.83	5,063.96	5,057.53	6.43	787.717	
1,100.00	1,100.00	1,033.42	1,033.39	3.72	3.41	177.67	-5,060.05	205.99	5,064.27	5,057.15	7.12	710.918	
1,200.00	1,200.00	1,137.93	1,137.91	4.08	3.78	177.68	-5,060.40	205.38	5,064.58	5,056.73	7.85	645.401	
1,300.00	1,300.00	1,252.13	1,252.10	4.44	4.17	177.68	-5,060.56	205.07	5,064.71	5,056.11	8.60	588.641	
1,400.00	1,400.00	1,366.68	1,366.65	4.79	4.57	177.68	-5,060.32	205.23	5,064.51	5,055.15	9.36	541.002	
1,500.00	1,500.00	1,479.82	1,479.79	5.15	4.96	177.67	-5,059.80	205.63	5,064.06	5,053.95	10.11	500.712	
1,600.00	1,600.00	1,579.11	1,579.07	5.51	5.31	177.67	-5,059.18	206.21	5,063.46	5,052.64	10.82	468.044	
1,700.00	1,700.00	1,700.62	1,700.57	5.87	5.73	177.65	-5,058.22	207.74	5,062.74	5,051.14	11.60	436.408	
1,800.00	1,800.00	1,803.91	1,803.83	6.23	6.09	177.62	-5,057.08	209.89	5,061.71	5,049.39	12.32	410.816	
1,900.00	1,900.00	1,899.17	1,899.07	6.59	6.43	177.60	-5,056.02	212.08	5,060.70	5,047.69	13.01	388.877	
2,000.00	2,000.00	1,980.93	1,980.80	6.95	6.71	177.58	-5,055.30	213.92	5,059.92	5,046.26	13.66	370.450	
2,100.00	2,100.00	2,074.33	2,074.17	7.30	7.04	177.55	-5,054.74	216.03	5,059.41	5,045.07	14.34	352.707	
2,200.00	2,200.00	2,170.23	2,170.05	7.66	7.38	177.53	-5,054.23	218.12	5,058.98	5,043.94	15.04	336.396	
2,300.00	2,300.00	2,258.28	2,258.08	8.02	7.69	177.51	-5,053.90	219.83	5,058.68	5,042.98	15.71	322.103	
2,351.15	2,351.15	2,301.65	2,301.45	8.20	7.84	177.50	-5,053.83	220.57	5,058.64	5,042.60	16.04	315.375	
2,400.00	2,400.00	2,344.78	2,344.57	8.38	7.99	177.49	-5,053.82	221.29	5,058.67	5,042.30	16.37	309.098	
2,500.00	2,500.00	2,430.43	2,430.20	8.74	8.29	177.48	-5,053.96	222.74	5,058.91	5,041.89	17.02	297.173	
2,600.00	2,600.00	2,512.09	2,511.86	9.10	8.57	177.46	-5,054.39	223.95	5,059.49	5,041.82	17.67	286.385	
2,700.00	2,700.00	2,596.31	2,596.06	9.45	8.87	177.45	-5,055.11	224.98	5,060.41	5,042.09	18.32	276.244	
2,800.00	2,800.00	2,673.98	2,673.73	9.81	9.14	177.44	-5,056.08	225.77	5,061.70	5,042.75	18.95	267.148	
2,900.00	2,900.00	2,775.80	2,775.54	10.17	9.49	177.43	-5,057.64	226.63	5,063.27	5,043.61	19.66	257.528	
3,000.00	3,000.00	2,878.43	2,878.15	10.53	9.85	177.43	-5,059.08	227.34	5,064.70	5,044.32	20.38	248.539	
3,100.00	3,100.00	2,968.72	2,968.43	10.89	10.17	177.43	-5,060.42	227.55	5,066.20	5,045.15	21.05	240.664	
3,200.00	3,200.00	3,072.78	3,072.48	11.25	10.53	177.43	-5,062.14	227.26	5,067.83	5,046.06	21.77	232.758	
3,300.00	3,300.00	3,201.63	3,201.31	11.61	10.98	177.43	-5,063.77	227.53	5,069.12	5,046.54	22.58	224.469	
3,400.00	3,400.00	3,294.42	3,294.09	11.96	11.30	177.42	-5,064.70	228.51	5,070.16	5,046.90	23.27	217.930	
3,500.00	3,500.00	3,408.52	3,408.18	12.32	11.70	177.40	-5,065.75	229.92	5,071.14	5,047.12	24.02	211.098	
3,600.00	3,600.00	3,516.92	3,516.57	12.68	12.08	177.39	-5,066.50	231.07	5,071.87	5,047.11	24.76	204.840	
3,700.00	3,700.00	3,609.35	3,609.00	13.04	12.40	177.38	-5,067.10	232.16	5,072.58	5,047.14	25.44	199.383	
3,800.00	3,800.00	3,678.30	3,677.92	13.40	12.65	177.36	-5,067.80	233.73	5,073.70	5,047.66	26.04	194.844	
3,900.00	3,900.00	3,769.43	3,768.98	13.76	12.97	177.32	-5,069.10	237.00	5,075.29	5,048.57	26.72	189.960	
4,000.00	4,000.00	3,847.03	3,846.51	14.11	13.24	177.29	-5,070.30	240.11	5,077.04	5,049.69	27.35	185.652	
4,100.00	4,100.00	3,914.67	3,914.07	14.47	13.47	177.26	-5,071.76	242.93	5,079.40	5,051.46	27.94	181.796	
4,200.00	4,200.00	3,983.38	3,982.68	14.83	13.72	177.22	-5,073.66	246.16	5,082.39	5,053.86	28.54	178.102	
4,300.00	4,300.00	4,057.86	4,057.02	15.19	13.98	177.18	-5,076.13	250.07	5,085.96	5,056.80	29.15	174.455	
4,400.00	4,400.00	4,157.21	4,156.17	15.55	14.33	177.12	-5,079.78	255.20	5,089.89	5,060.03	29.86	170.447	
4,500.00	4,500.00	4,347.02	4,345.77	15.91	15.00	177.05	-5,085.02	262.12	5,092.84	5,061.94	30.90	164.825	
4,600.00	4,600.00	4,465.30	4,464.01	16.27	15.41	177.02	-5,087.03	264.62	5,094.64	5,062.97	31.67	160.856	
4,700.00	4,700.00	4,574.21	4,572.89	16.62	15.79	177.00	-5,088.70	266.33	5,096.26	5,063.84	32.41	157.235	
4,800.00	4,800.00	4,681.76	4,680.42	16.98	16.17	176.99	-5,090.18	267.67	5,097.69	5,064.55	33.15	153.793	
4,900.00	4,900.00	4,812.60	4,811.25	17.34	16.62	176.97	-5,091.55	269.08	5,098.80	5,064.84	33.96	150.127	
5,000.00	5,000.00	4,922.21	4,920.85	17.70	17.01	176.97	-5,092.21	269.81	5,099.44	5,064.74	34.70	146.938	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 153H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS, 7564-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
5,100.00	5,100.00	5,016.52	5,015.16	18.06	17.33	176.96	-5,092.81	270.49	5,100.95	5,065.55	35.39	144.127		
5,200.00	5,199.96	5,129.11	5,127.74	18.41	17.73	176.94	-5,093.35	271.34	5,103.96	5,067.82	36.14	141.218		
5,300.00	5,299.86	5,223.87	5,222.50	18.77	18.06	176.92	-5,093.79	271.93	5,108.63	5,071.80	36.83	138.706		
5,400.00	5,399.68	5,321.13	5,319.76	19.13	18.40	176.89	-5,094.32	272.35	5,115.04	5,077.52	37.53	136.302		
5,500.00	5,499.37	5,421.91	5,420.54	19.49	18.75	176.87	-5,094.89	272.70	5,123.13	5,084.90	38.24	133.987		
5,600.00	5,598.90	5,520.98	5,519.60	19.84	19.10	176.83	-5,095.44	272.75	5,132.87	5,093.93	38.94	131.820		
5,600.13	5,599.03	5,521.09	5,519.72	19.84	19.10	176.83	-5,095.44	272.75	5,132.88	5,093.94	38.94	131.817		
5,700.00	5,698.36	5,617.16	5,615.78	20.20	19.43	176.80	-5,096.06	272.78	5,143.51	5,103.88	39.63	129.786		
5,800.00	5,797.81	5,726.80	5,725.43	20.56	19.82	176.77	-5,096.58	272.85	5,154.00	5,113.63	40.37	127.668		
5,900.00	5,897.26	5,815.93	5,814.55	20.92	20.13	176.73	-5,097.08	272.87	5,164.57	5,123.53	41.04	125.848		
6,000.00	5,996.71	5,916.91	5,915.53	21.28	20.48	176.70	-5,097.70	272.99	5,175.20	5,133.45	41.75	123.962		
6,100.00	6,096.16	6,015.08	6,013.69	21.65	20.83	176.66	-5,098.28	273.28	5,185.82	5,143.38	42.45	122.167		
6,200.00	6,195.62	6,104.80	6,103.41	22.01	21.14	176.63	-5,098.91	273.58	5,196.57	5,153.45	43.12	120.516		
6,300.00	6,295.07	6,198.35	6,196.96	22.37	21.47	176.59	-5,099.71	274.00	5,207.46	5,163.66	43.80	118.882		
6,400.00	6,394.52	6,304.67	6,303.27	22.74	21.84	176.55	-5,100.60	274.53	5,218.34	5,173.81	44.53	117.176		
6,500.00	6,493.97	6,393.05	6,391.65	23.11	22.15	176.52	-5,101.39	274.81	5,229.27	5,184.07	45.20	115.690		
6,600.00	6,593.42	6,510.89	6,509.48	23.47	22.56	176.48	-5,102.36	275.17	5,240.15	5,194.18	45.97	113.983		
6,700.00	6,692.88	6,611.21	6,609.80	23.84	22.91	176.44	-5,102.98	275.97	5,250.84	5,204.15	46.68	112.479		
6,800.00	6,792.33	6,699.71	6,698.29	24.21	23.22	176.40	-5,103.59	276.85	5,261.62	5,214.27	47.35	111.121		
6,900.00	6,891.78	6,785.74	6,784.32	24.58	23.53	176.36	-5,104.36	277.87	5,272.62	5,224.61	48.01	109.826		
7,000.00	6,991.23	6,890.29	6,888.84	24.95	23.89	176.31	-5,105.39	279.37	5,283.72	5,234.99	48.73	108.419		
7,100.00	7,090.68	6,982.39	6,980.94	25.32	24.21	176.27	-5,106.29	280.52	5,294.81	5,245.39	49.42	107.149		
7,200.00	7,190.14	7,087.06	7,085.59	25.69	24.58	176.22	-5,107.37	281.69	5,305.95	5,255.81	50.14	105.819		
7,300.00	7,289.59	7,175.30	7,173.82	26.07	24.89	176.18	-5,108.28	282.81	5,317.10	5,266.30	50.81	104.649		
7,400.00	7,389.04	7,266.65	7,265.16	26.44	25.21	176.13	-5,109.41	284.31	5,328.48	5,276.99	51.49	103.491		
7,500.00	7,488.49	7,372.50	7,370.97	26.81	25.58	176.08	-5,110.72	286.32	5,339.89	5,287.67	52.22	102.259		
7,600.00	7,587.94	7,469.07	7,467.53	27.18	25.92	176.04	-5,111.84	287.70	5,351.19	5,298.27	52.92	101.124		
7,700.00	7,687.40	7,564.48	7,562.92	27.56	26.14	176.00	-5,113.09	288.61	5,362.60	5,309.11	53.50	100.239		
7,800.00	7,786.85	7,596.00	7,594.44	27.93	26.14	175.97	-5,113.53	288.85	5,374.48	5,320.64	53.84	99.819		
7,841.35	7,827.97	7,611.29	7,609.73	28.09	26.14	175.95	-5,113.87	288.94	5,379.74	5,325.76	53.98	99.655		
7,900.00	7,886.33	7,628.00	7,626.43	28.31	26.14	175.94	-5,114.55	289.00	5,387.49	5,333.31	54.18	99.436		
8,000.00	7,985.96	7,628.00	7,626.43	28.68	26.14	175.91	-5,114.55	289.00	5,400.52	5,346.03	54.49	99.105		
8,100.00	8,085.73	7,643.15	7,641.54	29.05	26.14	175.89	-5,115.48	288.94	5,413.51	5,358.71	54.80	98.784		
8,200.00	8,185.60	7,660.00	7,658.33	29.41	26.15	175.88	-5,116.95	288.69	5,426.52	5,371.42	55.10	98.485		
8,300.00	8,285.54	7,660.00	7,658.33	29.77	26.15	175.87	-5,116.95	288.69	5,439.42	5,384.05	55.37	98.236		
8,400.00	8,385.52	7,660.00	7,658.33	30.13	26.15	175.87	-5,116.95	288.69	5,452.47	5,396.84	55.63	98.020		
8,441.48	8,427.00	7,676.08	7,674.29	30.28	26.15	175.87	-5,118.81	288.29	5,457.65	5,401.91	55.75	97.900		
8,500.00	8,485.52	7,691.00	7,689.05	30.49	26.15	175.88	-5,120.98	287.80	5,465.57	5,409.66	55.91	97.763		
8,600.00	8,585.52	7,691.00	7,689.05	30.84	26.15	175.88	-5,120.98	287.80	5,480.13	5,423.99	56.14	97.620		
8,700.00	8,685.52	7,691.00	7,689.05	31.19	26.15	175.88	-5,120.98	287.80	5,496.47	5,440.11	56.35	97.533		
8,800.00	8,785.52	7,707.90	7,705.67	31.55	26.15	175.89	-5,123.93	287.10	5,514.29	5,457.70	56.59	97.448		
8,900.00	8,885.52	7,723.00	7,720.44	31.90	26.15	175.90	-5,127.01	286.35	5,533.80	5,477.00	56.81	97.414		
9,000.00	8,985.52	7,723.00	7,720.44	32.26	26.15	175.90	-5,127.01	286.35	5,554.82	5,497.83	56.99	97.472		
9,100.00	9,085.52	7,723.00	7,720.44	32.61	26.15	175.90	-5,127.01	286.35	5,577.56	5,520.40	57.16	97.581		
9,200.00	9,185.52	7,755.00	7,751.38	32.97	26.16	175.93	-5,134.92	284.45	5,601.75	5,544.37	57.38	97.618		
9,300.00	9,285.52	7,755.00	7,751.38	33.32	26.16	175.93	-5,134.92	284.45	5,627.30	5,569.77	57.53	97.808		
9,400.00	9,385.52	7,755.00	7,751.38	33.68	26.16	175.93	-5,134.92	284.45	5,654.50	5,596.83	57.67	98.045		
9,500.00	9,485.52	7,755.00	7,751.38	34.03	26.16	175.93	-5,134.92	284.45	5,683.33	5,625.53	57.80	98.328		
9,600.00	9,585.52	7,786.00	7,780.83	34.38	26.17	175.95	-5,144.35	282.35	5,713.45	5,655.45	58.00	98.511		
9,700.00	9,685.52	7,786.00	7,780.83	34.74	26.17	175.95	-5,144.35	282.35	5,744.95	5,686.84	58.11	98.865		
9,800.00	9,785.52	7,786.00	7,780.83	35.09	26.17	175.95	-5,144.35	282.35	5,778.02	5,719.81	58.21	99.260		
9,900.00	9,885.52	7,786.00	7,780.83	35.45	26.17	175.95	-5,144.35	282.35	5,812.61	5,754.31	58.30	99.695		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 153H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS, 7564-MWD												Offset Well Error:	0.00 usft
Reference													
Offset													
Semi Major Axis													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
10,000.00	9,985.52	7,818.00	7,810.61	35.81	26.17	175.99	-5,155.83	280.08	5,848.33	5,789.85	58.49	99.996	
10,100.00	10,085.52	7,818.00	7,810.61	36.16	26.17	175.99	-5,155.83	280.08	5,885.41	5,826.84	58.57	100.492	
10,200.00	10,185.52	7,818.00	7,810.61	36.52	26.17	175.99	-5,155.83	280.08	5,923.94	5,865.30	58.64	101.023	
10,300.00	10,285.52	7,832.44	7,823.82	36.87	26.18	176.00	-5,161.56	279.02	5,963.70	5,904.95	58.75	101.506	
10,400.00	10,385.52	7,850.00	7,839.68	37.23	26.19	176.02	-5,168.98	277.67	6,004.87	5,946.00	58.88	101.992	
10,500.00	10,485.52	7,850.00	7,839.68	37.58	26.19	176.02	-5,168.98	277.67	6,047.12	5,988.19	58.93	102.608	
10,600.00	10,585.52	7,850.00	7,839.68	37.94	26.19	176.02	-5,168.98	277.67	6,090.73	6,031.74	58.99	103.253	
10,700.00	10,685.52	7,866.64	7,854.50	38.29	26.19	176.04	-5,176.41	276.28	6,135.43	6,076.33	59.10	103.817	
10,800.00	10,785.52	7,881.00	7,867.13	38.65	26.20	176.06	-5,183.11	274.93	6,181.36	6,122.16	59.20	104.420	
10,900.00	10,885.52	7,881.00	7,867.13	39.00	26.20	176.06	-5,183.11	274.93	6,228.40	6,169.16	59.24	105.134	
11,000.00	10,985.52	7,895.46	7,879.71	39.36	26.20	176.08	-5,190.09	273.46	6,276.54	6,217.20	59.34	105.773	
11,092.52	11,078.05	7,913.00	7,894.78	39.69	26.21	176.11	-5,198.86	271.56	6,322.09	6,262.65	59.44	106.354	
11,100.00	11,085.52	7,913.00	7,894.78	39.71	26.21	176.11	-5,198.86	271.56	6,325.76	6,266.31	59.45	106.413	
11,150.00	11,135.43	7,913.00	7,894.78	39.87	26.21	176.10	-5,198.86	271.56	6,348.24	6,288.80	59.44	106.795	
11,200.00	11,184.89	7,913.00	7,894.78	40.02	26.21	176.10	-5,198.86	271.56	6,367.09	6,307.66	59.43	107.135	
11,250.00	11,233.55	7,913.00	7,894.78	40.16	26.21	176.09	-5,198.86	271.56	6,382.19	6,322.78	59.41	107.428	
11,300.00	11,281.02	7,913.00	7,894.78	40.29	26.21	176.08	-5,198.86	271.56	6,393.46	6,334.09	59.38	107.676	
11,350.00	11,326.95	7,930.91	7,909.95	40.41	26.22	176.09	-5,208.15	269.49	6,400.59	6,341.19	59.40	107.745	
11,400.00	11,370.98	7,945.00	7,921.71	40.53	26.23	176.10	-5,215.72	267.79	6,403.92	6,344.51	59.41	107.799	
11,450.00	11,412.78	7,945.00	7,921.71	40.63	26.23	176.08	-5,215.72	267.79	6,403.13	6,343.79	59.34	107.905	
11,500.00	11,452.03	7,945.00	7,921.71	40.73	26.23	176.06	-5,215.72	267.79	6,398.39	6,339.13	59.26	107.966	
11,550.00	11,488.44	7,945.00	7,921.71	40.82	26.23	176.03	-5,215.72	267.79	6,389.72	6,330.54	59.17	107.982	
11,600.00	11,521.73	7,945.00	7,921.71	40.91	26.23	176.01	-5,215.72	267.79	6,377.16	6,318.09	59.07	107.952	
11,650.00	11,551.64	7,960.75	7,934.68	40.99	26.24	176.00	-5,224.44	265.81	6,360.61	6,301.58	59.03	107.751	
11,700.00	11,577.94	7,977.00	7,947.83	41.08	26.25	176.00	-5,233.75	263.71	6,340.51	6,281.53	58.98	107.500	
11,750.00	11,600.44	7,977.00	7,947.83	41.17	26.25	175.97	-5,233.75	263.71	6,316.62	6,257.76	58.86	107.321	
11,800.00	11,618.96	7,977.00	7,947.83	41.27	26.25	175.93	-5,233.75	263.71	6,289.29	6,230.56	58.73	107.093	
11,850.00	11,633.37	7,977.00	7,947.83	41.37	26.25	175.89	-5,233.75	263.71	6,258.67	6,200.08	58.59	106.815	
11,900.00	11,643.55	7,977.00	7,947.83	41.48	26.25	175.85	-5,233.75	263.71	6,224.97	6,166.51	58.46	106.487	
11,950.00	11,649.43	7,977.00	7,947.83	41.58	26.25	175.81	-5,233.75	263.71	6,188.38	6,130.05	58.32	106.107	
11,988.78	11,650.99	7,977.00	7,947.83	41.67	26.25	175.78	-5,233.75	263.71	6,158.15	6,099.93	58.22	105.775	
12,000.00	11,651.07	7,977.00	7,947.83	41.69	26.25	175.77	-5,233.75	263.71	6,149.19	6,091.00	58.19	105.673	
12,100.00	11,651.72	7,992.11	7,959.84	41.96	26.27	175.71	-5,242.70	261.70	6,069.46	6,011.47	57.98	104.678	
12,200.00	11,652.37	8,009.00	7,972.98	42.28	26.29	175.66	-5,253.05	259.39	5,990.48	5,932.70	57.78	103.671	
12,300.00	11,653.02	8,009.00	7,972.98	42.67	26.29	175.57	-5,253.05	259.39	5,911.87	5,854.36	57.51	102.802	
12,400.00	11,653.68	8,009.00	7,972.98	43.12	26.29	175.47	-5,253.05	259.39	5,833.92	5,776.69	57.23	101.937	
12,500.00	11,654.33	8,009.00	7,972.98	43.62	26.29	175.37	-5,253.05	259.39	5,756.64	5,699.69	56.96	101.073	
12,600.00	11,654.98	8,025.01	7,985.19	44.19	26.30	175.30	-5,263.16	257.17	5,679.90	5,623.14	56.76	100.066	
12,700.00	11,655.64	8,041.00	7,997.18	44.80	26.32	175.23	-5,273.50	254.92	5,603.89	5,547.32	56.57	99.059	
12,800.00	11,656.29	8,041.00	7,997.18	45.47	26.32	175.12	-5,273.50	254.92	5,528.45	5,472.15	56.30	98.190	
12,900.00	11,656.94	8,041.00	7,997.18	46.19	26.32	175.00	-5,273.50	254.92	5,453.81	5,397.77	56.04	97.321	
13,000.00	11,657.59	8,057.17	8,009.08	46.95	26.34	174.92	-5,284.21	252.65	5,379.78	5,323.92	55.86	96.301	
13,100.00	11,658.25	8,073.00	8,020.50	47.76	26.37	174.84	-5,294.95	250.45	5,306.61	5,250.92	55.69	95.282	
13,200.00	11,658.90	8,073.00	8,020.50	48.62	26.37	174.70	-5,294.95	250.45	5,234.12	5,178.68	55.45	94.401	
13,300.00	11,659.55	8,073.00	8,020.50	49.51	26.37	174.56	-5,294.95	250.45	5,162.55	5,107.35	55.20	93.517	
13,400.00	11,660.20	8,104.00	8,042.23	50.44	26.42	174.51	-5,316.68	246.39	5,091.76	5,036.62	55.14	92.342	
13,500.00	11,660.86	8,104.00	8,042.23	51.41	26.42	174.35	-5,316.68	246.39	5,021.71	4,966.79	54.92	91.442	
13,600.00	11,661.51	8,104.00	8,042.23	52.41	26.42	174.19	-5,316.68	246.39	4,952.69	4,897.99	54.70	90.536	
13,700.00	11,662.16	8,119.25	8,052.61	53.45	26.44	174.07	-5,327.70	244.55	4,884.53	4,829.95	54.59	89.482	
13,800.00	11,662.82	8,136.00	8,063.70	54.52	26.48	173.94	-5,340.10	242.62	4,817.46	4,762.97	54.49	88.410	
13,900.00	11,663.47	8,136.00	8,063.70	55.61	26.48	173.75	-5,340.10	242.62	4,751.29	4,696.98	54.32	87.476	
14,000.00	11,664.12	8,136.00	8,063.70	56.73	26.48	173.54	-5,340.10	242.62	4,686.32	4,632.17	54.16	86.532	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 153H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS, 7584-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset		Between Centres (usft)	Between Ellipses (usft)					
14,100.00	11,664.77	8,152.21	8,074.11	57.88	26.51	173.39	-5,352.41	240.84	4,622.33	4,568.23	54.10	85.434	
14,200.00	11,665.43	8,168.00	8,083.89	59.05	26.54	173.22	-5,364.69	239.21	4,559.63	4,505.57	54.07	84.334	
14,300.00	11,666.08	8,168.00	8,083.89	60.25	26.54	172.98	-5,364.69	239.21	4,498.01	4,444.05	53.96	83.353	
14,400.00	11,666.73	8,168.00	8,083.89	61.46	26.54	172.72	-5,364.69	239.21	4,437.80	4,383.91	53.88	82.359	
14,500.00	11,667.39	8,200.00	8,102.74	62.70	26.62	172.58	-5,390.35	236.04	4,378.71	4,324.72	53.99	81.100	
14,600.00	11,668.04	8,200.00	8,102.74	63.95	26.62	172.28	-5,390.35	236.04	4,320.86	4,266.91	53.96	80.078	
14,700.00	11,668.69	8,200.00	8,102.74	65.23	26.62	171.96	-5,390.35	236.04	4,264.58	4,210.62	53.95	79.044	
14,800.00	11,669.34	8,232.00	8,120.34	66.52	26.70	171.79	-5,416.87	232.82	4,209.49	4,155.36	54.13	77.769	
14,900.00	11,670.00	8,232.00	8,120.34	67.82	26.70	171.43	-5,416.87	232.82	4,155.86	4,101.69	54.18	76.709	
15,000.00	11,670.65	8,232.00	8,120.34	69.14	26.70	171.03	-5,416.87	232.82	4,103.98	4,049.72	54.26	75.639	
15,100.00	11,671.30	8,264.00	8,136.47	70.48	26.80	170.80	-5,444.32	229.63	4,053.48	3,998.97	54.51	74.361	
15,200.00	11,671.95	8,264.00	8,136.47	71.83	26.80	170.34	-5,444.32	229.63	4,004.57	3,949.92	54.65	73.271	
15,300.00	11,672.61	8,264.00	8,136.47	73.19	26.80	169.82	-5,444.32	229.63	3,957.59	3,902.75	54.83	72.176	
15,400.00	11,673.26	8,296.00	8,150.94	74.56	26.90	169.52	-5,472.69	226.52	3,912.20	3,857.03	55.17	70.910	
15,500.00	11,673.91	8,296.00	8,150.94	75.94	26.90	168.91	-5,472.69	226.52	3,868.53	3,813.11	55.42	69.806	
15,600.00	11,674.57	8,312.51	8,157.83	77.34	26.96	168.38	-5,487.61	224.90	3,826.75	3,770.99	55.76	68.628	
15,700.00	11,675.22	8,328.00	8,163.97	78.74	27.02	167.79	-5,501.74	223.36	3,786.81	3,730.67	56.13	67.462	
15,800.00	11,675.87	8,328.00	8,163.97	80.16	27.02	166.95	-5,501.74	223.36	3,748.90	3,692.41	56.49	66.366	
15,900.00	11,676.52	8,360.00	8,175.36	81.58	27.15	166.41	-5,531.48	220.30	3,712.97	3,656.00	56.98	65.166	
16,000.00	11,677.18	8,360.00	8,175.36	83.01	27.15	165.35	-5,531.48	220.30	3,678.94	3,621.53	57.41	64.086	
16,100.00	11,677.83	8,360.00	8,175.36	84.46	27.15	164.12	-5,531.48	220.30	3,647.33	3,589.46	57.87	63.021	
16,200.00	11,678.48	8,392.00	8,184.60	85.90	27.28	163.28	-5,561.99	217.55	3,617.97	3,559.52	58.46	61.893	
16,300.00	11,679.13	8,392.00	8,184.60	87.36	27.28	161.65	-5,561.99	217.55	3,590.55	3,531.55	58.99	60.863	
16,400.00	11,679.79	8,392.00	8,184.60	88.82	27.28	159.68	-5,561.99	217.55	3,565.72	3,506.14	59.57	59.855	
16,500.00	11,680.44	8,408.64	8,188.46	90.29	27.36	157.78	-5,578.11	216.24	3,543.16	3,482.94	60.21	58.842	
16,600.00	11,681.09	8,424.00	8,191.45	91.77	27.43	155.44	-5,593.14	215.08	3,523.11	3,462.23	60.88	57.865	
16,700.00	11,681.75	8,424.00	8,191.45	93.25	27.43	151.89	-5,593.14	215.08	3,505.48	3,443.91	61.56	56.940	
16,800.00	11,682.40	8,437.00	8,193.55	94.74	27.49	148.01	-5,605.93	214.13	3,490.30	3,428.01	62.29	56.032	
16,900.00	11,683.05	8,437.00	8,193.55	96.23	27.49	142.09	-5,605.93	214.13	3,477.89	3,414.85	63.03	55.175	
17,000.00	11,683.70	8,473.00	8,197.31	97.73	27.67	137.43	-5,641.64	211.68	3,467.69	3,403.86	63.83	54.328	
17,100.00	11,684.36	8,473.00	8,197.31	99.23	27.67	127.56	-5,641.64	211.68	3,459.94	3,395.32	64.62	53.542	
17,200.00	11,685.01	8,505.00	8,198.91	100.74	27.85	119.01	-5,673.55	209.88	3,454.77	3,389.32	65.45	52.783	
17,300.00	11,685.66	8,535.87	8,199.87	102.25	28.02	108.47	-5,704.36	208.30	3,451.55	3,385.25	66.30	52.059	
17,400.00	11,686.32	8,586.58	8,200.72	103.77	28.33	99.98	-5,755.00	205.72	3,450.00	3,382.83	67.17	51.360	
17,500.00	11,686.97	8,692.01	8,201.99	105.29	29.03	101.03	-5,860.39	203.52	3,449.28	3,381.16	68.12	50.633	
17,600.00	11,687.62	8,771.20	8,203.49	106.81	29.60	97.18	-5,939.55	204.86	3,448.26	3,379.17	69.09	49.906	
17,636.70	11,687.86	8,791.89	8,203.73	107.37	29.76	94.21	-5,960.23	205.49	3,448.17	3,378.73	69.44	49.653	
17,700.00	11,688.27	8,834.10	8,203.97	108.34	30.09	90.27	-6,002.41	207.09	3,448.42	3,378.35	70.07	49.217	
17,800.00	11,688.93	8,957.45	8,205.30	109.88	31.14	94.47	-6,125.58	213.57	3,448.41	3,377.22	71.20	48.433	
17,812.33	11,689.01	8,967.60	8,205.41	110.06	31.23	94.07	-6,135.72	214.01	3,448.41	3,377.08	71.33	48.344	
17,900.00	11,689.58	9,038.44	8,205.88	111.41	31.88	91.01	-6,206.54	215.87	3,448.61	3,376.35	72.26	47.724	
18,000.00	11,690.23	9,116.19	8,205.84	112.95	32.65	87.00	-6,284.28	216.80	3,449.42	3,376.09	73.34	47.036	
18,100.00	11,690.88	9,193.94	8,205.23	114.49	33.41	83.02	-6,362.03	216.96	3,450.88	3,376.47	74.41	46.378	
18,200.00	11,691.54	9,285.87	8,204.02	116.04	34.37	81.59	-6,453.94	216.71	3,452.81	3,377.26	75.54	45.706	
18,300.00	11,692.19	9,420.66	8,203.07	117.59	35.85	87.80	-6,588.73	216.71	3,454.11	3,377.26	76.85	44.948	
18,400.00	11,692.84	9,492.00	8,202.49	119.14	36.66	82.67	-6,660.07	216.64	3,455.55	3,377.58	77.97	44.321	
18,500.00	11,693.50	9,660.93	8,201.72	120.70	38.66	95.03	-6,828.99	217.35	3,456.90	3,377.43	79.47	43.501	
18,600.00	11,694.15	9,755.77	8,202.65	122.25	39.83	94.11	-6,923.82	217.27	3,456.58	3,375.86	80.72	42.821	
18,700.00	11,694.80	9,881.88	8,203.74	123.81	41.42	98.74	-7,049.92	217.12	3,456.40	3,374.28	82.12	42.090	
18,800.00	11,695.45	9,971.02	8,204.87	125.37	42.57	96.82	-7,139.06	217.57	3,455.84	3,372.45	83.39	41.441	
18,900.00	11,696.11	10,146.42	8,208.66	126.94	44.90	109.52	-7,314.41	218.72	3,454.47	3,369.41	85.06	40.613	
19,000.00	11,696.76	10,264.80	8,213.04	128.51	46.50	112.33	-7,432.71	219.52	3,451.49	3,364.99	86.50	39.902	

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 153H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 100-GYRO-NS, 7564-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
19,100.00	11,697.41	10,319.79	8,214.76	130.08	47.26	105.11	-7,487.67	219.94	3,449.04	3,361.37	87.67	39.341			
19,200.00	11,698.07	10,388.40	8,216.18	131.65	48.21	99.75	-7,556.26	220.80	3,447.70	3,358.80	88.91	38.780			
19,300.00	11,698.72	10,473.26	8,217.39	133.22	49.39	97.09	-7,641.10	221.67	3,447.02	3,356.80	90.22	38.206			
19,400.00	11,699.37	10,581.90	8,218.73	134.80	50.92	98.58	-7,749.73	222.07	3,446.48	3,354.82	91.66	37.601			
19,500.00	11,700.02	10,676.31	8,220.27	136.37	52.27	97.60	-7,844.13	222.41	3,445.56	3,352.52	93.04	37.035			
19,561.47	11,700.42	10,716.97	8,220.64	137.34	52.85	93.96	-7,884.79	222.23	3,445.37	3,351.58	93.80	36.732 CC			
19,600.00	11,700.68	10,734.00	8,220.72	137.95	53.10	90.16	-7,901.82	222.08	3,445.46	3,351.23	94.23	36.584			
19,700.00	11,701.33	10,800.41	8,220.44	139.53	54.05	84.20	-7,968.22	221.04	3,446.45	3,350.99	95.46	36.102			
19,800.00	11,701.98	10,800.00	8,219.33	141.11	54.70	85.85	-8,077.68	218.86	3,447.92	3,291.17	156.75	21.996			
19,900.00	11,702.63	11,031.52	8,219.25	142.70	57.42	89.71	-8,199.29	217.65	3,448.46	3,350.02	98.45	35.029			
20,000.00	11,703.29	11,101.99	8,218.87	144.28	58.46	84.41	-8,269.76	217.17	3,449.59	3,349.87	99.72	34.593			
20,100.00	11,703.94	11,244.09	8,218.04	145.87	60.57	91.97	-8,411.85	216.04	3,450.83	3,349.46	101.38	34.039			
20,200.00	11,704.59	11,366.72	8,219.33	147.46	62.40	96.01	-8,534.47	217.18	3,450.46	3,347.50	102.96	33.513			
20,300.00	11,705.25	11,461.28	8,220.21	149.05	63.83	95.03	-8,629.01	218.13	3,450.26	3,345.87	104.40	33.050			
20,358.37	11,705.63	11,513.98	8,220.67	149.98	64.63	94.01	-8,681.71	218.61	3,450.19	3,344.96	105.22	32.789			
20,400.00	11,705.90	11,546.01	8,220.85	150.64	65.11	92.30	-8,713.75	218.75	3,450.24	3,344.46	105.78	32.617			
20,500.00	11,706.55	11,625.04	8,220.88	152.24	66.31	88.54	-8,792.77	218.62	3,450.84	3,343.71	107.13	32.212			
20,600.00	11,707.20	11,600.00	8,221.04	153.83	67.61	92.95	-8,917.48	219.80	3,451.47	3,279.11	172.36	20.025 ES, SF			
20,687.14	11,707.77	11,842.78	8,222.00	155.22	69.64	93.98	-9,010.48	220.94	3,451.22	3,341.14	110.08	31.353			
20,700.00	11,707.86	11,851.32	8,222.06	155.43	69.77	93.22	-9,019.03	220.97	3,451.22	3,340.98	110.24	31.305			
20,800.00	11,708.51	11,924.57	8,222.09	157.02	70.89	88.46	-9,092.27	220.67	3,451.77	3,340.20	111.57	30.938			
20,900.00	11,709.16	12,086.62	8,222.60	158.62	73.39	99.45	-9,254.31	219.49	3,452.21	3,338.82	113.39	30.446			
21,000.00	11,709.82	12,180.48	8,223.98	160.22	74.84	98.37	-9,348.16	219.73	3,451.42	3,336.57	114.85	30.052			
21,100.00	11,710.47	12,280.47	8,225.38	161.82	76.40	98.37	-9,448.14	219.96	3,450.70	3,334.36	116.34	29.659			
21,158.34	11,710.85	12,314.00	8,225.84	162.76	76.92	93.99	-9,481.67	220.03	3,450.37	3,333.29	117.08	29.470			
21,200.00	11,711.12	12,314.00	8,225.84	163.42	76.92	86.57	-9,481.67	220.03	3,450.62	3,333.16	117.46	29.377			
21,300.00	11,711.77	12,314.00	8,225.84	165.03	76.92	69.64	-9,481.67	220.03	3,453.28	3,334.94	118.34	29.181			
21,400.00	11,712.43	12,314.00	8,225.84	166.63	76.92	55.69	-9,481.67	220.03	3,458.82	3,339.67	119.15	29.028			
21,500.00	11,713.08	12,314.00	8,225.84	168.23	76.92	45.18	-9,481.67	220.03	3,467.24	3,347.34	119.91	28.916			
21,600.00	11,713.73	12,314.00	8,225.84	169.84	76.92	37.47	-9,481.67	220.03	3,478.52	3,357.93	120.59	28.845			
21,656.46	11,714.10	12,314.00	8,225.84	170.75	76.92	34.04	-9,481.67	220.03	3,486.14	3,365.19	120.95	28.823			



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 154H - Wellbore #1 - Surveys													Offset Site Error:
Survey Program: 100-VESSEL_GYROFLEX, 7569-MWD													0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	163.16	-5,058.53	1,530.77	5,285.20				
100.00	100.00	72.79	72.79	0.13	0.05	163.16	-5,058.48	1,530.75	5,285.02	5,284.84	0.18	N/A	
200.00	200.00	170.49	170.49	0.49	0.19	163.16	-5,058.31	1,530.70	5,284.84	5,284.16	0.68	7,735.556	
300.00	300.00	267.02	267.02	0.85	0.36	163.16	-5,058.23	1,530.72	5,284.77	5,283.56	1.21	4,363.214	
400.00	400.00	415.07	415.06	1.21	0.62	163.17	-5,057.94	1,529.59	5,284.42	5,282.59	1.83	2,888.947	
500.00	500.00	504.20	504.18	1.57	0.78	163.19	-5,057.74	1,527.87	5,283.62	5,281.28	2.34	2,254.440	
600.00	600.00	583.25	583.20	1.93	0.92	163.21	-5,057.82	1,526.08	5,283.07	5,280.23	2.84	1,860.253	
700.00	700.00	665.72	665.65	2.29	1.06	163.23	-5,058.25	1,524.11	5,282.88	5,279.54	3.34	1,580.735	
709.21	709.21	673.39	673.31	2.32	1.08	163.23	-5,058.31	1,523.92	5,282.88	5,279.49	3.39	1,559.101	
800.00	800.00	759.45	759.35	2.64	1.23	163.26	-5,059.02	1,521.78	5,282.95	5,279.09	3.86	1,367.368	
900.00	900.00	863.28	863.14	3.00	1.41	163.29	-5,059.82	1,519.38	5,283.02	5,278.61	4.40	1,199.921	
1,000.00	1,000.00	954.76	954.61	3.36	1.57	163.31	-5,060.40	1,517.60	5,283.07	5,278.15	4.92	1,073.675	
1,100.00	1,100.00	1,052.18	1,052.00	3.72	1.75	163.33	-5,061.21	1,515.82	5,283.34	5,277.89	5.45	969.673	
1,200.00	1,200.00	1,154.13	1,153.94	4.08	1.93	163.34	-5,061.82	1,514.38	5,283.51	5,277.52	5.98	882.873	
1,300.00	1,300.00	1,252.18	1,251.99	4.44	2.10	163.35	-5,062.32	1,513.48	5,283.74	5,277.22	6.51	811.165	
1,400.00	1,400.00	1,362.67	1,362.48	4.79	2.30	163.36	-5,062.71	1,512.81	5,283.90	5,276.84	7.06	747.934	
1,500.00	1,500.00	1,468.62	1,468.43	5.15	2.48	163.37	-5,062.73	1,512.54	5,283.84	5,276.24	7.61	694.494	
1,560.19	1,560.19	1,524.48	1,524.29	5.37	2.58	163.37	-5,062.68	1,512.58	5,283.81	5,275.88	7.92	667.026	
1,600.00	1,600.00	1,558.14	1,557.95	5.51	2.63	163.36	-5,062.68	1,512.63	5,283.83	5,275.71	8.12	650.496	
1,700.00	1,700.00	1,651.46	1,651.26	5.87	2.79	163.36	-5,062.84	1,512.84	5,284.05	5,275.41	8.64	611.327	
1,800.00	1,800.00	1,755.58	1,755.38	6.23	2.97	163.36	-5,062.93	1,513.32	5,284.26	5,275.08	9.18	575.425	
1,900.00	1,900.00	1,861.04	1,860.84	6.59	3.15	163.35	-5,062.76	1,514.30	5,284.37	5,274.65	9.73	543.348	
2,000.00	2,000.00	1,960.02	1,959.81	6.95	3.32	163.34	-5,062.48	1,515.41	5,284.42	5,274.17	10.26	515.218	
2,100.00	2,100.00	2,049.09	2,048.88	7.30	3.47	163.32	-5,062.30	1,516.47	5,284.58	5,273.81	10.77	490.656	
2,200.00	2,200.00	2,132.51	2,132.29	7.66	3.62	163.31	-5,062.35	1,517.60	5,285.02	5,273.75	11.27	468.769	
2,300.00	2,300.00	2,219.90	2,219.67	8.02	3.77	163.30	-5,062.71	1,518.73	5,285.79	5,274.00	11.78	448.519	
2,400.00	2,400.00	2,325.13	2,324.89	8.38	3.95	163.29	-5,063.16	1,519.92	5,286.52	5,274.19	12.33	428.853	
2,500.00	2,500.00	2,410.57	2,410.33	8.74	4.10	163.28	-5,063.70	1,520.77	5,287.41	5,274.57	12.83	411.966	
2,600.00	2,600.00	2,500.06	2,499.81	9.10	4.25	163.28	-5,064.52	1,521.51	5,288.52	5,275.17	13.35	396.165	
2,700.00	2,700.00	2,585.34	2,585.08	9.45	4.40	163.27	-5,065.50	1,522.24	5,289.88	5,276.02	13.86	381.757	
2,800.00	2,800.00	2,678.85	2,678.58	9.81	4.57	163.27	-5,066.79	1,523.06	5,291.44	5,277.07	14.38	368.004	
2,900.00	2,900.00	2,757.70	2,757.42	10.17	4.71	163.27	-5,068.11	1,523.51	5,293.23	5,278.35	14.87	355.852	
3,000.00	3,000.00	2,835.59	2,835.29	10.53	4.84	163.27	-5,069.83	1,523.87	5,295.47	5,280.10	15.37	344.555	
3,100.00	3,100.00	2,916.64	2,916.31	10.89	4.98	163.27	-5,071.92	1,524.24	5,298.07	5,282.20	15.87	333.867	
3,200.00	3,200.00	2,991.40	2,991.04	11.25	5.12	163.28	-5,074.16	1,524.66	5,301.10	5,284.74	16.36	324.087	
3,300.00	3,300.00	3,099.81	3,099.39	11.61	5.31	163.28	-5,077.50	1,525.66	5,304.32	5,287.41	16.91	313.742	
3,400.00	3,400.00	3,201.96	3,201.49	11.96	5.49	163.26	-5,080.20	1,527.62	5,307.40	5,289.96	17.44	304.239	
3,500.00	3,500.00	3,298.82	3,298.28	12.32	5.66	163.24	-5,082.56	1,530.18	5,310.50	5,292.52	17.97	295.465	
3,600.00	3,600.00	3,394.92	3,394.32	12.68	5.83	163.23	-5,084.98	1,532.67	5,313.65	5,295.15	18.50	287.216	
3,700.00	3,700.00	3,548.72	3,548.05	13.04	6.10	163.20	-5,088.25	1,535.78	5,316.24	5,297.10	19.13	277.853	
3,800.00	3,800.00	3,639.25	3,638.55	13.40	6.26	163.19	-5,089.74	1,537.56	5,318.39	5,298.74	19.65	270.648	
3,900.00	3,900.00	3,708.32	3,707.57	13.76	6.38	163.17	-5,091.01	1,539.68	5,321.05	5,300.92	20.13	264.354	
4,000.00	4,000.00	3,780.58	3,779.76	14.11	6.50	163.15	-5,092.56	1,542.54	5,324.25	5,303.64	20.61	258.312	
4,100.00	4,100.00	3,842.14	3,841.24	14.47	6.61	163.13	-5,094.17	1,545.27	5,328.04	5,306.97	21.07	252.820	
4,200.00	4,200.00	3,900.00	3,899.01	14.83	6.72	163.11	-5,096.18	1,547.74	5,332.62	5,311.09	21.53	247.691	
4,300.00	4,300.00	3,957.45	3,956.35	15.19	6.82	163.09	-5,098.61	1,550.37	5,337.99	5,316.01	21.98	242.831	
4,400.00	4,400.00	4,017.42	4,016.17	15.55	6.92	163.06	-5,101.49	1,553.60	5,344.15	5,321.71	22.44	238.162	
4,500.00	4,500.00	4,083.95	4,082.48	15.91	7.04	163.03	-5,105.02	1,557.57	5,350.97	5,328.06	22.91	233.589	
4,600.00	4,600.00	4,175.55	4,173.77	16.27	7.20	162.99	-5,110.32	1,562.99	5,358.23	5,334.81	23.43	228.738	
4,700.00	4,700.00	4,370.58	4,368.33	16.62	7.55	162.94	-5,120.78	1,571.28	5,364.58	5,340.44	24.15	222.172	
4,800.00	4,800.00	4,500.87	4,498.44	16.98	7.78	162.92	-5,126.73	1,574.99	5,369.78	5,345.04	24.74	217.052	
4,900.00	4,900.00	4,617.86	4,615.28	17.34	7.98	162.91	-5,131.63	1,578.13	5,374.57	5,349.26	25.31	212.371	

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



MS Energy Services

Anticollision Report



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Site Error: 0.00 usft
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Local Co-ordinate Reference: Well 518H
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 154H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 100-VESSL_GYROFLEX, 7569-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Warning							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
5,000.00	5,000.00	4,723.43	4,720.74	17.70	8.17	162.89	-5,135.88	1,580.78	5,379.16	5,353.31	25.85	208.063			
5,100.00	5,100.00	4,837.84	4,835.02	18.06	8.37	162.87	-5,140.24	1,583.89	5,384.48	5,358.07	26.42	203.836			
5,200.00	5,199.96	4,972.91	4,969.95	18.41	8.61	162.84	-5,144.47	1,588.11	5,391.00	5,363.99	27.02	199.547			
5,300.00	5,299.86	5,079.34	5,076.29	18.77	8.80	162.82	-5,147.38	1,591.29	5,398.84	5,371.28	27.56	195.881			
5,400.00	5,399.68	5,182.64	5,179.52	19.13	8.99	162.80	-5,150.27	1,593.99	5,408.38	5,380.28	28.10	192.460			
5,500.00	5,499.37	5,283.90	5,280.71	19.49	9.16	162.77	-5,153.06	1,596.57	5,419.59	5,390.95	28.64	189.256			
5,600.00	5,598.90	5,456.65	5,453.38	19.84	9.47	162.75	-5,156.85	1,600.20	5,431.88	5,402.57	29.30	185.363			
5,600.13	5,599.03	5,456.85	5,453.58	19.84	9.47	162.75	-5,156.85	1,600.20	5,431.89	5,402.59	29.30	185.359			
5,700.00	5,698.36	5,579.12	5,575.82	20.20	9.69	162.72	-5,158.42	1,602.26	5,444.02	5,414.14	29.88	182.217			
5,800.00	5,797.81	5,678.83	5,675.51	20.56	9.87	162.71	-5,159.58	1,603.81	5,456.03	5,425.62	30.41	179.430			
5,900.00	5,897.26	5,775.19	5,771.86	20.92	10.04	162.69	-5,160.75	1,605.27	5,468.07	5,437.13	30.93	176.772			
6,000.00	5,996.71	5,871.94	5,868.59	21.28	10.21	162.68	-5,162.02	1,606.61	5,480.16	5,448.70	31.46	174.199			
6,100.00	6,096.16	5,982.46	5,979.09	21.65	10.40	162.66	-5,163.44	1,608.01	5,492.21	5,460.20	32.01	171.570			
6,200.00	6,195.62	6,119.11	6,115.72	22.01	10.65	162.65	-5,164.75	1,609.15	5,503.82	5,471.20	32.61	168.765			
6,300.00	6,295.07	6,226.08	6,222.69	22.37	10.84	162.64	-5,165.28	1,609.81	5,514.91	5,481.75	33.16	166.321			
6,400.00	6,394.52	6,303.38	6,299.99	22.74	10.97	162.63	-5,165.79	1,610.42	5,526.22	5,492.57	33.65	164.226			
6,500.00	6,493.97	6,418.07	6,414.67	23.11	11.18	162.62	-5,166.58	1,611.43	5,537.58	5,503.37	34.21	161.866			
6,600.00	6,593.42	6,519.06	6,515.66	23.47	11.35	162.61	-5,167.19	1,612.07	5,548.78	5,514.03	34.75	159.691			
6,700.00	6,692.88	6,610.28	6,606.87	23.84	11.52	162.60	-5,167.84	1,612.56	5,560.06	5,524.79	35.27	157.663			
6,800.00	6,792.33	6,714.16	6,710.75	24.21	11.70	162.60	-5,168.65	1,612.90	5,571.34	5,535.54	35.81	155.590			
6,900.00	6,891.78	6,805.69	6,802.28	24.58	11.86	162.59	-5,169.45	1,613.07	5,582.67	5,546.34	36.33	153.677			
7,000.00	6,991.23	6,885.28	6,881.86	24.95	12.00	162.59	-5,170.33	1,613.28	5,594.24	5,557.42	36.82	151.917			
7,100.00	7,090.68	7,008.15	7,004.73	25.32	12.22	162.59	-5,171.74	1,613.56	5,605.85	5,568.45	37.40	149.875			
7,200.00	7,190.14	7,102.28	7,098.84	25.69	12.39	162.58	-5,172.64	1,613.71	5,617.26	5,579.33	37.93	148.101			
7,300.00	7,289.59	7,219.98	7,216.54	26.07	12.60	162.58	-5,173.57	1,613.98	5,628.52	5,590.02	38.50	146.202			
7,400.00	7,389.04	7,290.60	7,287.16	26.44	12.72	162.57	-5,174.24	1,614.24	5,639.95	5,600.97	38.98	144.692			
7,500.00	7,488.49	7,376.37	7,372.92	26.81	12.87	162.57	-5,175.27	1,614.69	5,651.68	5,612.19	39.49	143.123			
7,600.00	7,587.94	7,456.04	7,452.58	27.18	13.02	162.56	-5,176.38	1,615.30	5,663.68	5,623.70	39.99	141.644			
7,700.00	7,687.40	7,529.64	7,526.17	27.56	13.15	162.55	-5,177.62	1,616.17	5,676.08	5,635.61	40.47	140.253			
7,800.00	7,786.85	7,583.39	7,579.90	27.93	13.19	162.54	-5,178.72	1,616.73	5,688.93	5,648.06	40.86	139.215			
7,841.35	7,827.97	7,601.00	7,597.50	28.09	13.19	162.54	-5,179.31	1,616.97	5,694.64	5,653.63	41.01	138.869			
7,900.00	7,886.33	7,601.00	7,597.50	28.31	13.19	162.54	-5,179.31	1,616.97	5,702.75	5,661.55	41.20	138.411			
8,000.00	7,985.96	7,601.00	7,597.50	28.68	13.19	162.53	-5,179.31	1,616.97	5,716.58	5,675.06	41.53	137.662			
8,100.00	8,085.73	7,632.00	7,628.42	29.05	13.20	162.53	-5,181.40	1,617.40	5,730.16	5,688.30	41.86	136.894			
8,200.00	8,185.60	7,632.00	7,628.42	29.41	13.20	162.53	-5,181.40	1,617.40	5,743.42	5,701.26	42.17	136.199			
8,300.00	8,285.54	7,632.00	7,628.42	29.77	13.20	162.53	-5,181.40	1,617.40	5,756.68	5,714.20	42.47	135.540			
8,400.00	8,385.52	7,647.59	7,643.92	30.13	13.20	162.53	-5,183.09	1,617.64	5,769.66	5,726.88	42.78	134.872			
8,441.48	8,427.00	7,663.00	7,659.18	30.28	13.20	162.54	-5,185.20	1,617.94	5,775.16	5,732.25	42.91	134.586			
8,500.00	8,485.52	7,663.00	7,659.18	30.49	13.20	162.54	-5,185.20	1,617.94	5,782.87	5,739.79	43.08	134.239			
8,600.00	8,585.52	7,663.00	7,659.18	30.84	13.20	162.54	-5,185.20	1,617.94	5,797.38	5,754.02	43.36	133.701			
8,700.00	8,685.52	7,663.00	7,659.18	31.19	13.20	162.54	-5,185.20	1,617.94	5,813.58	5,769.94	43.64	133.231			
8,800.00	8,785.52	7,695.00	7,690.68	31.55	13.21	162.55	-5,190.78	1,618.66	5,831.09	5,787.15	43.94	132.717			
8,900.00	8,885.52	7,695.00	7,690.68	31.90	13.21	162.55	-5,190.78	1,618.66	5,850.08	5,805.88	44.20	132.358			
9,000.00	8,985.52	7,695.00	7,690.68	32.26	13.21	162.55	-5,190.78	1,618.66	5,870.71	5,826.25	44.45	132.061			
9,100.00	9,085.52	7,727.00	7,721.85	32.61	13.22	162.56	-5,197.98	1,619.36	5,892.75	5,848.00	44.74	131.699			
9,200.00	9,185.52	7,727.00	7,721.85	32.97	13.22	162.56	-5,197.98	1,619.36	5,916.08	5,871.09	44.99	131.502			
9,300.00	9,285.52	7,727.00	7,721.85	33.32	13.22	162.56	-5,197.98	1,619.36	5,941.01	5,895.78	45.23	131.361			
9,400.00	9,385.52	7,741.19	7,735.53	33.68	13.22	162.57	-5,201.74	1,619.60	5,967.31	5,921.83	45.48	131.208			
9,500.00	9,485.52	7,758.00	7,751.59	34.03	13.23	162.58	-5,206.68	1,619.79	5,995.14	5,949.41	45.73	131.091			
9,600.00	9,585.52	7,758.00	7,751.59	34.38	13.23	162.58	-5,206.68	1,619.79	6,024.22	5,978.27	45.95	131.090			
9,700.00	9,685.52	7,758.00	7,751.59	34.74	13.23	162.58	-5,206.68	1,619.79	6,054.82	6,008.65	46.17	131.138			
9,800.00	9,785.52	7,789.00	7,780.83	35.09	13.24	162.61	-5,216.96	1,619.95	6,086.70	6,040.27	46.44	131.074			

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 154H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 100-VESSI_GYROFLEX, 7568-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)					
9,900.00	9,885.52	7,789.00	7,780.83	35.45	13.24	162.61	-5,216.96	1,619.95	6,119.78	6,073.14	46.65	131.197	
10,000.00	9,985.52	7,789.00	7,780.83	35.81	13.24	162.61	-5,216.96	1,619.95	6,154.31	6,107.46	46.85	131.364	
10,100.00	10,085.52	7,821.00	7,810.50	36.16	13.26	162.65	-5,228.96	1,619.87	6,190.10	6,142.99	47.11	131.394	
10,200.00	10,185.52	7,821.00	7,810.50	36.52	13.26	162.65	-5,228.96	1,619.87	6,226.97	6,179.66	47.31	131.626	
10,300.00	10,285.52	7,821.00	7,810.50	36.87	13.26	162.65	-5,228.96	1,619.87	6,265.22	6,217.72	47.50	131.896	
10,400.00	10,385.52	7,837.86	7,825.89	37.23	13.27	162.67	-5,235.84	1,619.69	6,304.61	6,256.88	47.73	132.097	
10,500.00	10,485.52	7,852.00	7,838.66	37.58	13.28	162.69	-5,241.91	1,619.48	6,345.25	6,297.30	47.94	132.344	
10,600.00	10,585.52	7,852.00	7,838.66	37.94	13.28	162.69	-5,241.91	1,619.48	6,387.05	6,338.92	48.13	132.703	
10,700.00	10,685.52	7,852.00	7,838.66	38.29	13.28	162.69	-5,241.91	1,619.48	6,430.13	6,381.82	48.31	133.093	
10,800.00	10,785.52	7,883.00	7,866.18	38.65	13.30	162.74	-5,256.16	1,618.92	6,474.18	6,425.61	48.57	133.308	
10,900.00	10,885.52	7,883.00	7,866.18	39.00	13.30	162.74	-5,256.16	1,618.92	6,519.33	6,470.59	48.75	133.742	
11,000.00	10,985.52	7,883.00	7,866.18	39.36	13.30	162.74	-5,256.16	1,618.92	6,565.70	6,516.77	48.92	134.202	
11,092.52	11,078.05	7,897.73	7,879.01	39.69	13.31	162.76	-5,263.39	1,618.64	6,609.48	6,560.36	49.12	134.546	
11,100.00	11,085.52	7,898.36	7,879.55	39.71	13.31	162.76	-5,263.70	1,618.63	6,613.02	6,563.89	49.14	134.582	
11,150.00	11,135.43	7,915.00	7,893.85	39.87	13.33	162.78	-5,272.21	1,618.32	6,634.83	6,585.59	49.25	134.728	
11,200.00	11,184.89	7,915.00	7,893.85	40.02	13.33	162.76	-5,272.21	1,618.32	6,652.90	6,603.59	49.31	134.927	
11,250.00	11,233.55	7,915.00	7,893.85	40.16	13.33	162.73	-5,272.21	1,618.32	6,667.34	6,617.97	49.36	135.069	
11,300.00	11,281.02	7,915.00	7,893.85	40.29	13.33	162.68	-5,272.21	1,618.32	6,678.06	6,628.65	49.41	135.157	
11,350.00	11,326.95	7,915.00	7,893.85	40.41	13.33	162.62	-5,272.21	1,618.32	6,685.00	6,635.55	49.45	135.193	
11,400.00	11,370.98	7,915.00	7,893.85	40.53	13.33	162.55	-5,272.21	1,618.32	6,688.11	6,638.64	49.48	135.177	
11,450.00	11,412.78	7,931.04	7,907.44	40.63	13.34	162.50	-5,280.73	1,618.03	6,687.20	6,637.66	49.54	134.992	
11,500.00	11,452.03	7,946.00	7,919.94	40.73	13.36	162.43	-5,288.95	1,617.79	6,682.58	6,632.99	49.59	134.767	
11,550.00	11,488.44	7,946.00	7,919.94	40.82	13.36	162.33	-5,288.95	1,617.79	6,673.98	6,624.40	49.58	134.597	
11,600.00	11,521.73	7,946.00	7,919.94	40.91	13.36	162.21	-5,288.95	1,617.79	6,661.63	6,612.06	49.57	134.379	
11,650.00	11,551.64	7,946.00	7,919.94	40.99	13.36	162.09	-5,288.95	1,617.79	6,645.60	6,596.05	49.55	134.111	
11,700.00	11,577.94	7,946.00	7,919.94	41.08	13.36	161.95	-5,288.95	1,617.79	6,625.98	6,576.46	49.52	133.794	
11,750.00	11,600.44	7,946.00	7,919.94	41.17	13.36	161.81	-5,288.95	1,617.79	6,602.89	6,553.41	49.49	133.428	
11,800.00	11,618.96	7,961.62	7,932.79	41.27	13.38	161.69	-5,297.82	1,617.55	6,576.27	6,526.78	49.49	132.888	
11,850.00	11,633.37	7,977.00	7,945.22	41.37	13.40	161.56	-5,306.87	1,617.33	6,546.70	6,497.22	49.48	132.305	
11,900.00	11,643.55	7,977.00	7,945.22	41.48	13.40	161.40	-5,306.87	1,617.33	6,513.96	6,464.53	49.43	131.783	
11,950.00	11,649.43	7,977.00	7,945.22	41.58	13.40	161.23	-5,306.87	1,617.33	6,478.46	6,429.08	49.37	131.210	
11,988.78	11,650.99	7,977.00	7,945.22	41.67	13.40	161.09	-5,306.87	1,617.33	6,449.16	6,399.83	49.33	130.730	
12,000.00	11,651.07	7,977.00	7,945.22	41.69	13.40	161.05	-5,306.87	1,617.33	6,440.48	6,391.16	49.32	130.585	
12,100.00	11,651.72	7,977.00	7,945.22	41.96	13.40	160.69	-5,306.87	1,617.33	6,363.44	6,314.24	49.20	129.331	
12,200.00	11,652.37	7,977.00	7,945.22	42.28	13.40	160.32	-5,306.87	1,617.33	6,287.05	6,237.96	49.10	128.057	
12,300.00	11,653.02	7,994.32	7,958.98	42.67	13.43	159.98	-5,317.38	1,617.09	6,211.12	6,162.07	49.05	126.618	
12,400.00	11,653.68	8,008.00	7,969.68	43.12	13.45	159.62	-5,325.91	1,616.89	6,135.92	6,086.91	49.01	125.185	
12,500.00	11,654.33	8,008.00	7,969.68	43.62	13.45	159.21	-5,325.91	1,616.89	6,061.30	6,012.35	48.95	123.833	
12,600.00	11,654.98	8,008.00	7,969.68	44.19	13.45	158.78	-5,325.91	1,616.89	5,987.42	5,938.52	48.89	122.456	
12,700.00	11,655.64	8,022.35	7,980.73	44.80	13.48	158.38	-5,335.06	1,616.71	5,914.14	5,865.24	48.80	120.931	
12,800.00	11,656.29	8,040.00	7,994.07	45.47	13.52	157.97	-5,346.62	1,616.55	5,841.71	5,792.77	48.84	119.356	
12,900.00	11,656.94	8,040.00	7,994.07	46.19	13.52	157.49	-5,346.62	1,616.55	5,769.86	5,720.91	48.94	117.887	
13,000.00	11,657.59	8,040.00	7,994.07	46.95	13.52	156.99	-5,346.62	1,616.55	5,698.85	5,649.89	48.96	116.388	
13,100.00	11,658.25	8,040.00	7,994.07	47.76	13.52	156.47	-5,346.62	1,616.55	5,628.73	5,579.72	49.01	114.858	
13,200.00	11,658.90	8,055.65	8,005.63	48.62	13.56	155.99	-5,357.17	1,616.50	5,559.27	5,510.15	49.12	113.171	
13,300.00	11,659.55	8,071.00	8,016.68	49.51	13.60	155.48	-5,367.82	1,616.56	5,490.85	5,441.59	49.26	111.462	
13,400.00	11,660.20	8,071.00	8,016.68	50.44	13.60	154.90	-5,367.82	1,616.56	5,423.18	5,373.80	49.38	109.834	
13,500.00	11,660.86	8,071.00	8,016.68	51.41	13.60	154.28	-5,367.82	1,616.56	5,356.51	5,307.00	49.52	108.175	
13,600.00	11,661.51	8,071.00	8,016.68	52.41	13.60	153.64	-5,367.82	1,616.56	5,290.90	5,241.21	49.69	106.485	
13,700.00	11,662.16	8,102.00	8,038.13	53.45	13.70	153.12	-5,390.19	1,616.94	5,226.19	5,176.20	49.99	104.549	
13,800.00	11,662.82	8,102.00	8,038.13	54.52	13.70	152.42	-5,390.19	1,616.94	5,162.36	5,112.14	50.22	102.801	
13,900.00	11,663.47	8,102.00	8,038.13	55.61	13.70	151.69	-5,390.19	1,616.94	5,099.68	5,049.21	50.48	101.026	

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 154H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-VESSL_GYROFLEX, 7569-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
14,000.00	11,664.12	8,102.00	8,038.13	56.73	13.70	150.92	-5,390.19	1,616.94	5,038.22	4,987.44	50.77	99.227		
14,100.00	11,664.77	8,134.00	8,059.08	57.88	13.82	150.30	-5,414.37	1,617.41	4,977.68	4,926.48	51.21	97.211		
14,200.00	11,665.43	8,134.00	8,059.08	59.05	13.82	149.46	-5,414.37	1,617.41	4,918.26	4,866.69	51.57	95.372		
14,300.00	11,666.08	8,134.00	8,059.08	60.25	13.82	148.58	-5,414.37	1,617.41	4,860.18	4,808.21	51.97	93.518		
14,400.00	11,666.73	8,165.00	8,078.25	61.46	13.94	147.88	-5,438.73	1,617.65	4,803.16	4,750.66	52.50	91.488		
14,500.00	11,667.39	8,165.00	8,078.25	62.70	13.94	146.91	-5,438.73	1,617.65	4,747.37	4,694.39	52.98	89.615		
14,600.00	11,668.04	8,181.42	8,087.97	63.95	14.02	146.03	-5,451.96	1,617.69	4,692.87	4,639.33	53.53	87.660		
14,700.00	11,668.69	8,196.00	8,096.39	65.23	14.09	145.09	-5,463.87	1,617.66	4,639.65	4,585.52	54.13	85.721		
14,800.00	11,669.34	8,196.00	8,096.39	66.52	14.09	143.96	-5,463.87	1,617.66	4,587.85	4,533.14	54.71	83.852		
14,900.00	11,670.00	8,228.00	8,113.97	67.82	14.25	143.10	-5,490.60	1,617.52	4,537.35	4,481.92	55.42	81.865		
15,000.00	11,670.65	8,228.00	8,113.97	69.14	14.25	141.87	-5,490.60	1,617.52	4,488.23	4,432.14	56.09	80.021		
15,100.00	11,671.30	8,242.32	8,121.43	70.48	14.33	140.73	-5,502.82	1,617.46	4,440.66	4,383.83	56.83	78.144		
15,200.00	11,671.95	8,259.00	8,129.81	71.83	14.42	139.55	-5,517.24	1,617.45	4,394.63	4,337.02	57.61	76.289		
15,300.00	11,672.61	8,259.00	8,129.81	73.19	14.42	138.11	-5,517.24	1,617.45	4,350.18	4,291.80	58.38	74.516		
15,400.00	11,673.26	8,290.00	8,144.52	74.56	14.61	137.01	-5,544.53	1,617.39	4,307.22	4,247.96	59.26	72.682		
15,500.00	11,673.91	8,290.00	8,144.52	75.94	14.61	135.41	-5,544.53	1,617.39	4,265.92	4,205.81	60.10	70.975		
15,600.00	11,674.57	8,322.00	8,158.53	77.34	14.83	134.22	-5,573.30	1,617.09	4,226.18	4,165.13	61.05	69.224		
15,700.00	11,675.22	8,322.00	8,158.53	78.74	14.83	132.46	-5,573.30	1,617.09	4,188.16	4,126.20	61.96	67.599		
15,800.00	11,675.87	8,353.00	8,171.00	80.16	15.05	131.14	-5,601.67	1,616.65	4,151.73	4,088.78	62.96	65.945		
15,900.00	11,676.52	8,353.00	8,171.00	81.58	15.05	129.19	-5,601.67	1,616.65	4,117.20	4,053.28	63.92	64.413		
16,000.00	11,677.18	8,384.00	8,181.87	83.01	15.28	127.75	-5,630.69	1,615.99	4,084.66	4,019.69	64.97	62.873		
16,100.00	11,677.83	8,384.00	8,181.87	84.46	15.28	125.61	-5,630.69	1,615.99	4,053.77	3,987.79	65.98	61.443		
16,200.00	11,678.48	8,384.00	8,181.87	85.90	15.28	123.34	-5,630.69	1,615.99	4,025.12	3,958.12	67.01	60.072		
16,300.00	11,679.13	8,415.00	8,190.82	87.36	15.53	121.68	-5,660.35	1,615.04	3,998.37	3,930.27	68.11	58.706		
16,400.00	11,679.79	8,415.00	8,190.82	88.82	15.53	119.20	-5,660.35	1,615.04	3,973.62	3,904.45	69.17	57.447		
16,500.00	11,680.44	8,430.08	8,194.53	90.29	15.66	116.99	-5,674.95	1,614.53	3,950.98	3,880.72	70.27	56.226		
16,600.00	11,681.09	8,447.00	8,198.09	91.77	15.81	114.74	-5,691.48	1,613.93	3,930.55	3,859.17	71.38	55.065		
16,700.00	11,681.75	8,447.00	8,198.09	93.25	15.81	111.93	-5,691.48	1,613.93	3,912.24	3,839.77	72.47	53.988		
16,800.00	11,682.40	8,478.00	8,203.56	94.74	16.09	109.91	-5,721.98	1,612.82	3,895.83	3,822.21	73.61	52.923		
16,900.00	11,683.05	8,509.00	8,208.07	96.23	16.38	107.85	-5,752.62	1,611.63	3,881.44	3,806.68	74.76	51.916		
17,000.00	11,683.70	8,509.00	8,208.07	97.73	16.38	104.77	-5,752.62	1,611.63	3,869.07	3,793.22	75.85	51.009		
17,100.00	11,684.36	8,541.00	8,211.49	99.23	16.69	102.63	-5,784.42	1,610.55	3,858.76	3,781.76	77.00	50.112		
17,200.00	11,685.01	8,541.00	8,211.49	100.74	16.69	99.40	-5,784.42	1,610.55	3,850.69	3,772.62	78.08	49.320		
17,300.00	11,685.66	8,597.00	8,215.50	102.25	17.28	97.96	-5,840.26	1,609.26	3,844.11	3,764.82	79.29	48.480		
17,400.00	11,686.32	8,638.52	8,217.63	103.77	17.72	96.03	-5,881.72	1,608.55	3,839.29	3,758.82	80.47	47.711		
17,500.00	11,686.97	8,685.53	8,219.61	105.29	18.25	94.27	-5,928.69	1,608.15	3,835.79	3,754.11	81.68	46.960		
17,600.00	11,687.62	8,741.00	8,220.95	106.81	18.88	92.79	-5,984.13	1,607.94	3,833.86	3,750.94	82.92	46.234		
17,700.00	11,688.27	8,784.73	8,221.41	108.34	19.41	90.90	-6,027.87	1,607.88	3,833.20	3,749.06	84.13	45.562		
17,712.89	11,688.36	8,793.13	8,221.46	108.54	19.51	90.75	-6,036.26	1,607.87	3,833.19	3,748.89	84.30	45.472		
17,800.00	11,688.93	8,896.08	8,221.69	109.88	20.79	91.28	-6,139.21	1,607.37	3,833.40	3,747.75	85.64	44.761		
17,900.00	11,689.58	8,993.27	8,222.05	111.41	22.04	91.19	-6,236.38	1,605.39	3,832.75	3,745.63	87.12	43.996		
18,000.00	11,690.23	9,126.94	8,221.82	112.95	23.83	92.32	-6,369.99	1,601.53	3,832.28	3,743.48	88.79	43.160		
18,071.89	11,690.70	9,144.05	8,221.67	114.06	24.07	90.48	-6,387.09	1,600.98	3,832.00	3,742.37	89.62	42.756		
18,100.00	11,690.88	9,153.84	8,221.53	114.49	24.20	89.86	-6,396.88	1,600.68	3,832.12	3,742.16	89.96	42.597		
18,200.00	11,691.54	9,210.00	8,219.95	116.04	24.98	88.38	-6,453.00	1,599.34	3,833.84	3,742.57	91.27	42.006		
18,300.00	11,692.19	9,237.43	8,218.83	117.59	25.37	85.94	-6,480.39	1,598.94	3,836.84	3,744.42	92.42	41.516		
18,400.00	11,692.84	9,483.80	8,214.76	119.14	28.92	90.87	-6,726.68	1,600.24	3,839.84	3,744.83	95.01	40.414		
18,500.00	11,693.50	9,586.45	8,215.05	120.70	30.43	90.96	-6,829.32	1,599.08	3,839.67	3,742.95	96.72	39.701		
18,600.00	11,694.15	18,600.00	8,214.79	122.25	166.07	92.52	-6,975.71	1,595.67	3,839.60	3,668.27	171.33	22.410 SF		
18,700.00	11,694.80	9,882.67	8,217.60	123.81	34.89	94.21	-7,125.36	1,590.37	3,836.62	3,735.89	100.73	38.089		
18,800.00	11,695.45	9,940.02	8,218.17	125.37	35.76	92.77	-7,182.66	1,588.05	3,834.51	3,732.35	102.17	37.532		
18,900.00	11,696.11	10,085.37	8,220.02	126.94	38.00	94.31	-7,327.92	1,583.41	3,832.64	3,728.43	104.20	36.780		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 154H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 100-VESSI_GYROFLEX, 7569-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
19,000.00	11,696.76	10,226.18	8,224.02	128.51	40.18	95.70	-7,468.62	1,579.79	3,829.61	3,723.34	106.26	36.039	
19,100.00	11,697.41	10,338.00	8,227.71	130.08	41.92	96.11	-7,580.26	1,574.59	3,825.12	3,717.03	108.10	35.386	
19,200.00	11,698.07	10,399.93	8,229.07	131.65	42.88	94.82	-7,642.05	1,570.80	3,821.23	3,711.64	109.59	34.870	
19,300.00	11,698.72	10,448.31	8,228.88	133.22	43.64	93.07	-7,690.30	1,567.14	3,818.83	3,707.87	110.96	34.417	
19,400.00	11,699.37	10,503.92	8,228.35	134.80	44.51	91.54	-7,745.80	1,563.81	3,817.66	3,705.28	112.37	33.973	
19,445.50	11,699.67	10,527.00	8,228.11	135.51	44.87	90.77	-7,768.86	1,562.83	3,817.51	3,704.50	113.01	33.781	
19,500.00	11,700.02	10,561.50	8,227.65	136.37	45.41	90.08	-7,803.33	1,561.57	3,817.63	3,703.82	113.82	33.542	
19,600.00	11,700.68	10,621.00	8,226.34	137.95	46.35	88.68	-7,862.78	1,559.52	3,818.70	3,703.43	115.27	33.130	
19,700.00	11,701.33	10,696.42	8,224.27	139.53	47.54	87.83	-7,938.15	1,557.56	3,820.62	3,703.78	116.84	32.700	
19,800.00	11,701.98	10,832.46	8,222.33	141.11	49.70	89.08	-8,074.16	1,557.29	3,822.42	3,703.45	118.97	32.129	
19,900.00	11,702.63	10,925.02	8,221.90	142.70	51.18	88.82	-8,166.72	1,558.06	3,823.79	3,703.01	120.78	31.659	
20,000.00	11,703.29	11,058.20	8,220.49	144.28	53.31	89.96	-8,299.89	1,557.73	3,825.35	3,702.44	122.91	31.124	
20,100.00	11,703.94	11,244.49	8,222.89	145.87	56.30	92.94	-8,486.13	1,555.83	3,823.90	3,698.43	125.47	30.476	
20,200.00	11,704.59	11,344.82	8,225.18	147.46	57.91	92.95	-8,586.44	1,555.62	3,822.35	3,694.96	127.38	30.007	
20,300.00	11,705.25	11,438.62	8,227.22	149.05	59.42	92.74	-8,680.21	1,555.06	3,820.72	3,691.49	129.23	29.566	
20,400.00	11,705.90	11,524.89	8,228.80	150.64	60.81	92.27	-8,766.47	1,554.55	3,819.40	3,688.39	131.02	29.152	
20,500.00	11,706.55	11,609.28	8,230.01	152.24	62.18	91.73	-8,850.85	1,554.12	3,818.47	3,685.69	132.79	28.757	
20,600.00	11,707.20	11,720.97	8,231.09	153.83	63.98	92.13	-8,962.53	1,553.06	3,817.80	3,683.03	134.77	28.328	
20,700.00	11,707.86	11,823.57	8,232.39	155.43	65.64	92.22	-9,065.11	1,551.61	3,816.63	3,679.96	136.67	27.925	
20,800.00	11,708.51	11,916.59	8,233.47	157.02	67.14	91.98	-9,158.12	1,550.44	3,815.63	3,677.13	138.50	27.549	
20,900.00	11,709.16	11,992.44	8,233.95	158.62	68.37	91.15	-9,233.95	1,549.25	3,814.99	3,674.81	140.18	27.214	
20,936.48	11,709.40	12,018.33	8,233.93	159.21	68.79	90.78	-9,259.84	1,548.79	3,814.94	3,674.16	140.78	27.099 CC	
21,000.00	11,709.82	12,076.26	8,233.66	160.22	69.73	90.59	-9,317.76	1,547.60	3,815.02	3,673.11	141.91	26.884	
21,100.00	11,710.47	12,182.15	8,232.85	161.82	71.44	90.79	-9,423.60	1,544.75	3,815.13	3,671.34	143.78	26.534	
21,147.41	11,710.78	12,235.44	8,232.38	162.58	72.31	90.99	-9,476.86	1,542.92	3,815.09	3,670.40	144.69	26.368	
21,200.00	11,711.12	12,275.53	8,231.93	163.42	72.95	90.56	-9,516.93	1,541.53	3,815.13	3,669.59	145.54	26.213	
21,300.00	11,711.77	12,364.75	8,230.67	165.03	74.40	90.18	-9,606.08	1,538.37	3,815.47	3,668.21	147.26	25.910	
21,400.00	11,712.43	12,457.16	8,229.08	166.63	75.89	89.91	-9,698.41	1,534.93	3,816.02	3,667.03	148.99	25.613	
21,500.00	11,713.08	12,553.31	8,227.38	168.23	77.45	89.78	-9,794.50	1,531.68	3,816.75	3,666.00	150.75	25.318 ES	
21,600.00	11,713.73	12,583.00	8,226.86	169.84	77.93	87.31	-9,824.16	1,530.69	3,818.16	3,666.18	151.98	25.122	
21,656.46	11,714.10	12,583.00	8,226.86	170.75	77.93	85.33	-9,824.16	1,530.69	3,820.04	3,667.53	152.51	25.048	



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 216Y - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey Program: 111-VESSL_GYRO_DROP, 4375-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)					
1,600.00	1,600.00	1,705.11	1,704.62	5.51	2.92	174.98	-9,960.10	874.63	9,999.84	9,991.41	8.43	1,186.706	
1,700.00	1,700.00	1,794.79	1,794.28	5.87	3.08	174.98	-9,958.64	874.49	9,998.20	9,989.26	8.94	1,117.784	
1,800.00	1,800.00	1,920.66	1,920.13	6.23	3.30	174.98	-9,956.47	874.62	9,996.49	9,986.96	9.53	1,049.291	
1,900.00	1,900.00	14,870.00	10,332.24	6.59	82.84	176.97	-5,256.79	278.34	9,994.11	9,952.88	41.23	242.400	
2,000.00	2,000.00	14,870.00	10,332.24	6.95	82.84	176.97	-5,256.79	278.34	9,909.24	9,867.88	41.37	239.540	
2,100.00	2,100.00	14,870.00	10,332.24	7.30	82.84	176.97	-5,256.79	278.34	9,824.67	9,783.16	41.51	236.683	
2,200.00	2,200.00	14,870.00	10,332.24	7.66	82.84	176.97	-5,256.79	278.34	9,740.38	9,698.72	41.66	233.834	
2,300.00	2,300.00	14,870.00	10,332.24	8.02	82.84	176.97	-5,256.79	278.34	9,656.39	9,614.59	41.80	230.992	
2,400.00	2,400.00	14,870.00	10,332.24	8.38	82.84	176.97	-5,256.79	278.34	9,572.71	9,530.76	41.96	228.160	
2,500.00	2,500.00	14,870.00	10,332.24	8.74	82.84	176.97	-5,256.79	278.34	9,489.35	9,447.24	42.11	225.340	
2,600.00	2,600.00	14,870.00	10,332.24	9.10	82.84	176.97	-5,256.79	278.34	9,406.31	9,364.04	42.27	222.532	
2,700.00	2,700.00	14,870.00	10,332.24	9.45	82.84	176.97	-5,256.79	278.34	9,323.61	9,281.18	42.43	219.737	
2,800.00	2,800.00	14,870.00	10,332.24	9.81	82.84	176.97	-5,256.79	278.34	9,241.24	9,198.65	42.59	216.958	
2,900.00	2,900.00	14,870.00	10,332.24	10.17	82.84	176.97	-5,256.79	278.34	9,159.23	9,116.47	42.76	214.195	
3,000.00	3,000.00	14,870.00	10,332.24	10.53	82.84	176.97	-5,256.79	278.34	9,077.58	9,034.65	42.93	211.448	
3,100.00	3,100.00	14,870.00	10,332.24	10.89	82.84	176.97	-5,256.79	278.34	8,996.30	8,953.20	43.10	208.718	
3,200.00	3,200.00	14,870.00	10,332.24	11.25	82.84	176.97	-5,256.79	278.34	8,915.40	8,872.12	43.28	206.007	
3,300.00	3,300.00	14,870.00	10,332.24	11.61	82.84	176.97	-5,256.79	278.34	8,834.89	8,791.43	43.45	203.315	
3,400.00	3,400.00	14,870.00	10,332.24	11.96	82.84	176.97	-5,256.79	278.34	8,754.78	8,711.15	43.63	200.643	
3,500.00	3,500.00	14,870.00	10,332.24	12.32	82.84	176.97	-5,256.79	278.34	8,675.08	8,631.27	43.82	197.991	
3,600.00	3,600.00	14,870.00	10,332.24	12.68	82.84	176.97	-5,256.79	278.34	8,595.81	8,551.81	44.00	195.360	
3,700.00	3,700.00	14,870.00	10,332.24	13.04	82.84	176.97	-5,256.79	278.34	8,516.98	8,472.79	44.19	192.750	
3,800.00	3,800.00	14,870.00	10,332.24	13.40	82.84	176.97	-5,256.79	278.34	8,438.60	8,394.22	44.38	190.162	
3,900.00	3,900.00	14,870.00	10,332.24	13.76	82.84	176.97	-5,256.79	278.34	8,360.67	8,316.10	44.57	187.597	
4,000.00	4,000.00	14,870.00	10,332.24	14.11	82.84	176.97	-5,256.79	278.34	8,283.22	8,238.46	44.76	185.056	
4,100.00	4,100.00	14,870.00	10,332.24	14.47	82.84	176.97	-5,256.79	278.34	8,206.26	8,161.30	44.96	182.537	
4,200.00	4,200.00	14,870.00	10,332.24	14.83	82.84	176.97	-5,256.79	278.34	8,129.80	8,084.64	45.15	180.043	
4,300.00	4,300.00	14,870.00	10,332.24	15.19	82.84	176.97	-5,256.79	278.34	8,053.85	8,008.50	45.36	177.573	
4,400.00	4,400.00	14,870.00	10,332.24	15.55	82.84	176.97	-5,256.79	278.34	7,978.44	7,932.88	45.56	175.129	
4,500.00	4,500.00	14,870.00	10,332.24	15.91	82.84	176.97	-5,256.79	278.34	7,903.57	7,857.81	45.76	172.710	
4,600.00	4,600.00	14,870.00	10,332.24	16.27	82.84	176.97	-5,256.79	278.34	7,829.26	7,783.29	45.97	170.317	
4,700.00	4,700.00	14,870.00	10,332.24	16.62	82.84	176.97	-5,256.79	278.34	7,755.53	7,709.35	46.18	167.950	
4,800.00	4,800.00	14,870.00	10,332.24	16.98	82.84	176.97	-5,256.79	278.34	7,682.40	7,636.01	46.39	165.610	
4,900.00	4,900.00	14,870.00	10,332.24	17.34	82.84	176.97	-5,256.79	278.34	7,609.87	7,563.27	46.60	163.297	
5,000.00	5,000.00	14,870.00	10,332.24	17.70	82.84	176.97	-5,256.79	278.34	7,537.98	7,491.16	46.82	161.011	
5,100.00	5,100.00	14,870.00	10,332.24	18.06	82.84	176.97	-5,256.79	278.34	7,467.32	7,420.29	47.03	158.770	
5,200.00	5,199.96	14,870.00	10,332.24	18.41	82.84	176.96	-5,256.79	278.34	7,398.55	7,351.30	47.25	156.584	
5,300.00	5,299.86	14,870.00	10,332.24	18.77	82.84	176.94	-5,256.79	278.34	7,331.74	7,284.27	47.47	154.449	
5,400.00	5,399.68	14,870.00	10,332.24	19.13	82.84	176.93	-5,256.79	278.34	7,266.97	7,219.27	47.69	152.365	
5,500.00	5,499.37	14,870.00	10,332.24	19.49	82.84	176.90	-5,256.79	278.34	7,204.31	7,156.39	47.92	150.336	
5,600.00	5,598.90	14,870.00	10,332.24	19.84	82.84	176.87	-5,256.79	278.34	7,143.83	7,095.68	48.15	148.363	
5,600.13	5,599.03	14,870.00	10,332.24	19.84	82.84	176.87	-5,256.79	278.34	7,143.76	7,095.61	48.15	148.361	
5,700.00	5,698.36	14,870.00	10,332.24	20.20	82.84	176.84	-5,256.79	278.34	7,084.93	7,036.55	48.38	146.431	
5,800.00	5,797.81	14,870.00	10,332.24	20.56	82.84	176.81	-5,256.79	278.34	7,026.97	6,978.35	48.62	144.528	
5,900.00	5,897.26	14,870.00	10,332.24	20.92	82.84	176.77	-5,256.79	278.34	6,969.95	6,921.09	48.86	142.659	
6,000.00	5,996.71	14,870.00	10,332.24	21.28	82.84	176.74	-5,256.79	278.34	6,913.91	6,864.81	49.10	140.823	
6,100.00	6,096.16	14,870.00	10,332.24	21.65	82.84	176.71	-5,256.79	278.34	6,858.87	6,809.53	49.34	139.022	
6,200.00	6,195.62	14,870.00	10,332.24	22.01	82.84	176.68	-5,256.79	278.34	6,804.86	6,755.28	49.58	137.255	
6,300.00	6,295.07	14,870.00	10,332.24	22.37	82.84	176.64	-5,256.79	278.34	6,751.89	6,702.07	49.82	135.523	
6,400.00	6,394.52	14,870.00	10,332.24	22.74	82.84	176.61	-5,256.79	278.34	6,700.00	6,649.93	50.07	133.826	
6,500.00	6,493.97	14,870.00	10,332.24	23.11	82.84	176.58	-5,256.79	278.34	6,649.20	6,598.89	50.31	132.163	
6,600.00	6,593.42	14,870.00	10,332.24	23.47	82.84	176.55	-5,256.79	278.34	6,599.53	6,548.98	50.56	130.536	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 216Y - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 111-VESSI_GYRO_DROP, 4375-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
6,700.00	6,692.88	14,870.00	10,332.24	23.84	82.84	176.52	-5,256.79	278.34	6,551.02	6,500.21	50.81	128.944		
6,800.00	6,792.33	14,870.00	10,332.24	24.21	82.84	176.49	-5,256.79	278.34	6,503.67	6,452.62	51.05	127.387		
6,900.00	6,891.78	14,870.00	10,332.24	24.58	82.84	176.46	-5,256.79	278.34	6,457.53	6,406.23	51.30	125.866		
7,000.00	6,991.23	14,870.00	10,332.24	24.95	82.84	176.42	-5,256.79	278.34	6,412.62	6,361.06	51.56	124.380		
7,100.00	7,090.68	14,870.00	10,332.24	25.32	82.84	176.39	-5,256.79	278.34	6,368.96	6,317.15	51.81	122.930		
7,200.00	7,190.14	14,870.00	10,332.24	25.69	82.84	176.36	-5,256.79	278.34	6,326.58	6,274.51	52.06	121.515		
7,300.00	7,289.59	14,870.00	10,332.24	26.07	82.84	176.33	-5,256.79	278.34	6,285.50	6,233.18	52.32	120.135		
7,400.00	7,389.04	14,870.00	10,332.24	26.44	82.84	176.30	-5,256.79	278.34	6,245.75	6,193.18	52.58	118.790		
7,500.00	7,488.49	14,870.00	10,332.24	26.81	82.84	176.27	-5,256.79	278.34	6,207.37	6,154.53	52.84	117.481		
7,600.00	7,587.94	14,870.00	10,332.24	27.18	82.84	176.24	-5,256.79	278.34	6,170.36	6,117.26	53.10	116.206		
7,700.00	7,687.40	14,870.00	10,332.24	27.56	82.84	176.21	-5,256.79	278.34	6,134.76	6,081.40	53.36	114.966		
7,800.00	7,786.85	14,870.00	10,332.24	27.93	82.84	176.18	-5,256.79	278.34	6,100.59	6,046.97	53.63	113.760		
7,841.35	7,827.97	14,870.00	10,332.24	28.09	82.84	176.17	-5,256.79	278.34	6,086.89	6,033.15	53.74	113.271		
7,900.00	7,886.33	14,870.00	10,332.24	28.31	82.84	176.15	-5,256.79	278.34	6,067.61	6,013.71	53.89	112.582		
8,000.00	7,985.96	14,870.00	10,332.24	28.68	82.84	176.13	-5,256.79	278.34	6,034.64	5,980.48	54.16	111.412		
8,100.00	8,085.73	14,870.00	10,332.24	29.05	82.84	176.11	-5,256.79	278.34	6,001.56	5,947.12	54.44	110.248		
8,200.00	8,185.60	14,870.00	10,332.24	29.41	82.84	176.09	-5,256.79	278.34	5,968.38	5,913.67	54.71	109.089		
8,300.00	8,285.54	14,870.00	10,332.24	29.77	82.84	176.08	-5,256.79	278.34	5,935.11	5,880.12	54.99	107.936		
8,400.00	8,385.52	14,870.00	10,332.24	30.13	82.84	176.08	-5,256.79	278.34	5,901.75	5,846.48	55.27	106.788		
8,441.48	8,427.00	14,870.00	10,332.24	30.28	82.84	176.08	-5,256.79	278.34	5,887.89	5,832.50	55.38	106.313		
8,500.00	8,485.52	14,870.00	10,332.24	30.49	82.84	176.08	-5,256.79	278.34	5,868.58	5,813.03	55.55	105.650		
8,600.00	8,585.52	14,870.00	10,332.24	30.84	82.84	176.08	-5,256.79	278.34	5,836.80	5,780.97	55.83	104.542		
8,700.00	8,685.52	14,870.00	10,332.24	31.19	82.84	176.08	-5,256.79	278.34	5,806.58	5,750.45	56.12	103.464		
8,800.00	8,785.52	14,870.00	10,332.24	31.55	82.84	176.08	-5,256.79	278.34	5,777.92	5,721.50	56.42	102.416		
8,900.00	8,885.52	14,870.00	10,332.24	31.90	82.84	176.08	-5,256.79	278.34	5,750.86	5,694.14	56.72	101.398		
9,000.00	8,985.52	14,870.00	10,332.24	32.26	82.84	176.08	-5,256.79	278.34	5,725.42	5,668.40	57.02	100.410		
9,100.00	9,085.52	14,870.00	10,332.24	32.61	82.84	176.08	-5,256.79	278.34	5,701.62	5,644.29	57.33	99.451		
9,200.00	9,185.52	14,870.00	10,332.24	32.97	82.84	176.08	-5,256.79	278.34	5,679.48	5,621.83	57.65	98.521		
9,300.00	9,285.52	14,870.00	10,332.24	33.32	82.84	176.08	-5,256.79	278.34	5,659.02	5,601.05	57.97	97.619		
9,400.00	9,385.52	14,870.00	10,332.24	33.68	82.84	176.08	-5,256.79	278.34	5,640.26	5,581.96	58.30	96.746		
9,500.00	9,485.52	14,870.00	10,332.24	34.03	82.84	176.08	-5,256.79	278.34	5,623.22	5,564.59	58.64	95.902		
9,600.00	9,585.52	14,870.00	10,332.24	34.38	82.84	176.08	-5,256.79	278.34	5,607.91	5,548.93	58.98	95.086		
9,700.00	9,685.52	14,870.00	10,332.24	34.74	82.84	176.08	-5,256.79	278.34	5,594.34	5,535.02	59.33	94.297		
9,800.00	9,785.52	14,870.00	10,332.24	35.09	82.84	176.08	-5,256.79	278.34	5,582.54	5,522.85	59.68	93.537		
9,900.00	9,885.52	14,870.00	10,332.24	35.45	82.84	176.08	-5,256.79	278.34	5,572.50	5,512.45	60.05	92.804		
10,000.00	9,985.52	14,870.00	10,332.24	35.81	82.84	176.08	-5,256.79	278.34	5,564.24	5,503.83	60.42	92.100		
10,100.00	10,085.52	14,870.00	10,332.24	36.16	82.84	176.08	-5,256.79	278.34	5,557.77	5,496.98	60.79	91.422		
10,200.00	10,185.52	14,870.00	10,332.24	36.52	82.84	176.08	-5,256.79	278.34	5,553.09	5,491.92	61.18	90.773		
10,300.00	10,285.52	14,870.00	10,332.24	36.87	82.84	176.08	-5,256.79	278.34	5,550.22	5,488.65	61.57	90.152		
10,400.00	10,385.52	14,870.00	10,332.24	37.23	82.84	176.08	-5,256.79	278.34	5,549.14	5,487.18	61.96	89.558		
10,409.82	10,395.34	14,870.00	10,332.24	37.26	82.84	176.08	-5,256.79	278.34	5,549.13	5,487.13	62.00	89.501		
10,500.00	10,485.52	14,870.00	10,332.24	37.58	82.84	176.08	-5,256.79	278.34	5,549.86	5,487.50	62.36	88.992		
10,600.00	10,585.52	14,870.00	10,332.24	37.94	82.84	176.08	-5,256.79	278.34	5,552.39	5,489.62	62.77	88.454		
10,700.00	10,685.52	14,870.00	10,332.24	38.29	82.84	176.08	-5,256.79	278.34	5,556.71	5,493.53	63.19	87.944		
10,800.00	10,785.52	14,870.00	10,332.24	38.65	82.84	176.08	-5,256.79	278.34	5,562.83	5,499.23	63.60	87.461		
10,900.00	10,885.52	14,870.00	10,332.24	39.00	82.84	176.08	-5,256.79	278.34	5,570.74	5,506.71	64.03	87.007		
11,000.00	10,985.52	14,870.00	10,332.24	39.36	82.84	176.08	-5,256.79	278.34	5,580.43	5,515.97	64.45	86.581		
11,092.52	11,078.05	14,870.00	10,332.24	39.69	82.84	176.08	-5,256.79	278.34	5,590.97	5,526.12	64.85	86.212		
11,100.00	11,085.52	14,870.00	10,332.24	39.71	82.84	176.08	-5,256.79	278.34	5,591.84	5,526.96	64.88	86.184		
11,150.00	11,135.43	14,870.00	10,332.24	39.87	82.84	176.08	-5,256.79	278.34	5,595.42	5,530.34	65.08	85.980		
11,200.00	11,184.89	14,870.00	10,332.24	40.02	82.84	176.07	-5,256.79	278.34	5,595.09	5,529.82	65.27	85.721		
11,250.00	11,233.55	14,870.00	10,332.24	40.16	82.84	176.06	-5,256.79	278.34	5,590.87	5,525.41	65.46	85.410		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 216Y - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 111-VESSEL_GYRO_DROP, 4375-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Warning					
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
11,300.00	11,281.02	14,870.00	10,332.24	40.29	82.84	176.05	-5,256.79	278.34	5,582.76	5,517.12	65.64	85.051	
11,350.00	11,326.95	14,870.00	10,332.24	40.41	82.84	176.04	-5,256.79	278.34	5,570.83	5,505.01	65.81	84.648	
11,400.00	11,370.98	14,870.00	10,332.24	40.53	82.84	176.02	-5,256.79	278.34	5,555.12	5,489.15	65.97	84.203	
11,450.00	11,412.78	14,870.00	10,332.24	40.63	82.84	176.00	-5,256.79	278.34	5,535.74	5,469.62	66.12	83.719	
11,500.00	11,452.03	14,870.00	10,332.24	40.73	82.84	175.98	-5,256.79	278.34	5,512.79	5,446.53	66.26	83.201	
11,550.00	11,488.44	14,870.00	10,332.24	40.82	82.84	175.95	-5,256.79	278.34	5,486.41	5,420.03	66.38	82.650	
11,600.00	11,521.73	14,870.00	10,332.24	40.91	82.84	175.92	-5,256.79	278.34	5,456.74	5,390.25	66.49	82.069	
11,650.00	11,551.64	14,870.00	10,332.24	40.99	82.84	175.89	-5,256.79	278.34	5,423.95	5,357.37	66.58	81.462	
11,700.00	11,577.94	14,870.00	10,332.24	41.08	82.84	175.86	-5,256.79	278.34	5,388.25	5,321.59	66.66	80.830	
11,750.00	11,600.44	14,870.00	10,332.24	41.17	82.84	175.82	-5,256.79	278.34	5,349.85	5,283.13	66.73	80.177	
11,800.00	11,618.96	14,870.00	10,332.24	41.27	82.84	175.79	-5,256.79	278.34	5,308.99	5,242.22	66.78	79.506	
11,850.00	11,633.37	14,870.00	10,332.24	41.37	82.84	175.75	-5,256.79	278.34	5,265.93	5,199.11	66.81	78.818	
11,900.00	11,643.55	14,870.00	10,332.24	41.48	82.84	175.71	-5,256.79	278.34	5,220.93	5,154.10	66.83	78.117	
11,950.00	11,649.43	14,870.00	10,332.24	41.58	82.84	175.66	-5,256.79	278.34	5,174.30	5,107.46	66.85	77.405	
11,980.00	11,650.99	14,870.00	10,332.24	41.67	82.84	175.63	-5,256.79	278.34	5,137.21	5,070.36	66.85	76.847	
12,000.00	11,651.07	14,870.00	10,332.24	41.69	82.84	175.62	-5,256.79	278.34	5,126.39	5,059.54	66.85	76.684	
12,100.00	11,651.72	14,870.00	10,332.24	41.96	82.84	175.53	-5,256.79	278.34	5,029.95	4,963.10	66.85	75.247	
12,200.00	11,652.37	14,870.00	10,332.24	42.28	82.84	175.44	-5,256.79	278.34	4,933.65	4,866.81	66.84	73.808	
12,300.00	11,653.02	14,870.00	10,332.24	42.67	82.84	175.34	-5,256.79	278.34	4,837.50	4,770.66	66.85	72.368	
12,400.00	11,653.68	14,870.00	10,332.24	43.12	82.84	175.24	-5,256.79	278.34	4,741.51	4,674.66	66.85	70.927	
12,500.00	11,654.33	14,870.00	10,332.24	43.62	82.84	175.13	-5,256.79	278.34	4,645.69	4,578.83	66.86	69.484	
12,600.00	11,654.98	14,870.00	10,332.24	44.19	82.84	175.02	-5,256.79	278.34	4,550.05	4,483.18	66.87	68.040	
12,700.00	11,655.64	14,870.00	10,332.24	44.80	82.84	174.90	-5,256.79	278.34	4,454.60	4,387.71	66.89	66.594	
12,800.00	11,656.29	14,870.00	10,332.24	45.47	82.84	174.78	-5,256.79	278.34	4,359.36	4,292.45	66.91	65.148	
12,900.00	11,656.94	14,870.00	10,332.24	46.19	82.84	174.65	-5,256.79	278.34	4,264.33	4,197.39	66.94	63.700	
13,000.00	11,657.59	14,870.00	10,332.24	46.95	82.84	174.52	-5,256.79	278.34	4,169.54	4,102.56	66.98	62.251	
13,100.00	11,658.25	14,870.00	10,332.24	47.76	82.84	174.38	-5,256.79	278.34	4,075.00	4,007.97	67.02	60.801	
13,200.00	11,658.90	14,870.00	10,332.24	48.62	82.84	174.23	-5,256.79	278.34	3,980.72	3,913.65	67.07	59.350	
13,300.00	11,659.55	14,870.00	10,332.24	49.51	82.84	174.07	-5,256.79	278.34	3,886.73	3,819.59	67.13	57.898	
13,400.00	11,660.20	14,870.00	10,332.24	50.44	82.84	173.91	-5,256.79	278.34	3,793.04	3,725.84	67.20	56.444	
13,500.00	11,660.86	14,870.00	10,332.24	51.41	82.84	173.73	-5,256.79	278.34	3,699.69	3,632.41	67.28	54.990	
13,600.00	11,661.51	14,870.00	10,332.24	52.41	82.84	173.55	-5,256.79	278.34	3,606.69	3,539.32	67.37	53.536	
13,700.00	11,662.16	14,870.00	10,332.24	53.45	82.84	173.35	-5,256.79	278.34	3,514.07	3,446.60	67.47	52.080	
13,800.00	11,662.82	14,870.00	10,332.24	54.52	82.84	173.14	-5,256.79	278.34	3,421.88	3,354.28	67.59	50.624	
13,900.00	11,663.47	14,870.00	10,332.24	55.61	82.84	172.92	-5,256.79	278.34	3,330.13	3,262.40	67.73	49.168	
14,000.00	11,664.12	14,870.00	10,332.24	56.73	82.84	172.68	-5,256.79	278.34	3,238.87	3,170.99	67.88	47.712	
14,100.00	11,664.77	14,870.00	10,332.24	57.88	82.84	172.43	-5,256.79	278.34	3,148.14	3,080.08	68.06	46.255	
14,200.00	11,665.43	14,870.00	10,332.24	59.05	82.84	172.16	-5,256.79	278.34	3,057.99	2,989.73	68.26	44.799	
14,300.00	11,666.08	14,870.00	10,332.24	60.25	82.84	171.87	-5,256.79	278.34	2,968.47	2,899.99	68.49	43.343	
14,400.00	11,666.73	14,870.00	10,332.24	61.46	82.84	171.55	-5,256.79	278.34	2,879.65	2,810.90	68.74	41.889	
14,500.00	11,667.39	14,870.00	10,332.24	62.70	82.84	171.21	-5,256.79	278.34	2,791.57	2,722.54	69.04	40.436	
14,600.00	11,668.04	14,870.00	10,332.24	63.95	82.84	170.85	-5,256.79	278.34	2,704.33	2,634.96	69.37	38.986	
14,700.00	11,668.69	14,870.00	10,332.24	65.23	82.84	170.45	-5,256.79	278.34	2,618.00	2,548.26	69.74	37.539	
14,800.00	11,669.34	14,870.00	10,332.24	66.52	82.84	170.01	-5,256.79	278.34	2,532.68	2,462.51	70.17	36.096	
14,900.00	11,670.00	14,870.00	10,332.24	67.82	82.84	169.54	-5,256.79	278.34	2,448.46	2,377.82	70.65	34.659	
15,000.00	11,670.65	14,870.00	10,332.24	69.14	82.84	169.02	-5,256.79	278.34	2,365.48	2,294.29	71.19	33.229	
15,100.00	11,671.30	14,870.00	10,332.24	70.48	82.84	168.44	-5,256.79	278.34	2,283.86	2,212.06	71.80	31.808	
15,200.00	11,671.95	14,870.00	10,332.24	71.83	82.84	167.80	-5,256.79	278.34	2,203.75	2,131.26	72.50	30.399	
15,300.00	11,672.61	14,870.00	10,332.24	73.19	82.84	167.09	-5,256.79	278.34	2,125.34	2,052.06	73.28	29.004	
15,400.00	11,673.26	14,870.00	10,332.24	74.56	82.84	166.29	-5,256.79	278.34	2,048.80	1,974.64	74.16	27.627	
15,500.00	11,673.91	14,870.00	10,332.24	75.94	82.84	165.39	-5,256.79	278.34	1,974.36	1,899.21	75.15	26.273	
15,600.00	11,674.57	14,870.00	10,332.24	77.34	82.84	164.36	-5,256.79	278.34	1,902.27	1,826.01	76.26	24.945	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 216Y - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 111-VESLI_GYRO_DROP_4375-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (")	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
15,700.00	11,675.22	14,870.00	10,332.24	78.74	82.84	163.18	-5,256.79	278.34	1,832.80	1,755.30	77.49	23.651		
15,800.00	11,675.87	14,870.00	10,332.24	80.16	82.84	161.82	-5,256.79	278.34	1,766.26	1,687.39	78.87	22.396		
15,900.00	11,676.52	14,870.00	10,332.24	81.58	82.84	160.22	-5,256.79	278.34	1,702.99	1,622.62	80.38	21.188		
16,000.00	11,677.18	14,870.00	10,332.24	83.01	82.84	158.34	-5,256.79	278.34	1,643.38	1,561.36	82.03	20.035		
16,100.00	11,677.83	14,870.00	10,332.24	84.46	82.84	156.08	-5,256.79	278.34	1,587.84	1,504.03	83.81	18.946		
16,200.00	11,678.48	14,870.00	10,332.24	85.90	82.84	153.33	-5,256.79	278.34	1,536.80	1,451.08	85.71	17.929		
16,300.00	11,679.13	14,870.00	10,332.24	87.36	82.84	149.94	-5,256.79	278.34	1,490.73	1,403.01	87.71	16.995		
16,400.00	11,679.79	14,870.00	10,332.24	88.82	82.84	145.67	-5,256.79	278.34	1,450.10	1,360.32	89.78	16.152		
16,500.00	11,680.44	14,870.00	10,332.24	90.29	82.84	140.21	-5,256.79	278.34	1,415.38	1,323.52	91.86	15.408		
16,600.00	11,681.09	14,870.00	10,332.24	91.77	82.84	133.15	-5,256.79	278.34	1,387.02	1,293.12	93.91	14.770		
16,700.00	11,681.75	14,870.00	10,332.24	93.25	82.84	123.98	-5,256.79	278.34	1,365.41	1,269.56	95.86	14.244		
16,800.00	11,682.40	14,870.00	10,332.24	94.74	82.84	112.32	-5,256.79	278.34	1,350.88	1,253.23	97.65	13.834		
16,900.00	11,683.05	14,870.00	10,332.24	96.23	82.84	98.36	-5,256.79	278.34	1,343.65	1,244.42	99.23	13.541		
17,000.00	11,683.70	14,811.13	10,335.53	97.73	81.87	92.06	-5,314.92	287.02	1,342.53	1,242.30	100.23	13.395		
17,043.32	11,683.99	14,772.90	10,337.58	98.38	81.24	91.22	-5,352.68	292.67	1,342.43	1,241.86	100.58	13.348 CC		
17,100.00	11,684.36	14,723.97	10,339.92	99.23	80.44	90.01	-5,401.04	299.73	1,342.61	1,241.58	101.03	13.290 ES		
17,200.00	11,685.01	14,637.75	10,343.19	100.74	79.03	87.98	-5,486.39	311.52	1,343.77	1,241.98	101.79	13.201		
17,300.00	11,685.66	14,552.02	10,345.25	102.25	77.63	86.01	-5,571.42	322.29	1,346.02	1,243.52	102.50	13.132		
17,400.00	11,686.32	14,458.84	10,346.52	103.77	76.12	85.12	-5,663.86	333.86	1,349.32	1,246.17	103.15	13.081		
17,500.00	11,686.97	14,366.49	10,348.13	105.29	74.62	84.18	-5,755.40	346.04	1,352.64	1,248.79	103.85	13.025		
17,600.00	11,687.62	14,291.83	10,348.55	106.81	73.40	81.10	-5,829.23	357.06	1,357.68	1,252.99	104.68	12.969		
17,700.00	11,688.27	14,197.79	10,348.55	108.34	71.88	80.53	-5,922.05	372.15	1,363.86	1,258.36	105.49	12.928		
17,800.00	11,688.93	14,102.52	10,348.63	109.88	70.33	80.15	-6,016.02	387.89	1,370.29	1,263.96	106.33	12.887		
17,900.00	11,689.58	14,042.38	10,348.17	111.41	69.36	75.87	-6,075.28	398.11	1,378.13	1,270.90	107.22	12.853		
18,000.00	11,690.23	13,902.96	10,346.38	112.95	67.11	80.42	-6,212.55	422.36	1,386.48	1,278.44	108.04	12.833		
18,100.00	11,690.88	13,787.48	10,347.51	114.49	65.25	82.18	-6,326.45	441.36	1,392.51	1,283.63	108.88	12.789		
18,200.00	11,691.54	13,684.33	10,347.72	116.04	63.61	82.60	-6,428.54	456.13	1,398.62	1,288.99	109.63	12.758		
18,300.00	11,692.19	13,467.53	10,355.26	117.59	60.20	94.23	-6,643.92	478.95	1,400.40	1,290.82	109.58	12.780		
18,400.00	11,692.84	13,372.77	10,361.90	119.14	58.72	93.62	-6,738.14	486.44	1,397.92	1,287.66	110.26	12.679		
18,500.00	11,693.50	13,295.02	10,366.08	120.70	57.52	91.41	-6,815.59	491.85	1,396.60	1,285.59	111.01	12.581		
18,525.35	11,693.66	13,280.83	10,366.73	121.09	57.30	90.33	-6,829.73	492.86	1,396.51	1,285.27	111.24	12.554		
18,600.00	11,694.15	13,197.92	10,370.03	122.25	56.02	91.09	-6,912.36	498.81	1,396.56	1,284.98	111.58	12.516		
18,651.38	11,694.48	13,149.57	10,372.07	123.05	55.28	90.78	-6,960.56	502.11	1,396.42	1,284.53	111.88	12.481		
18,700.00	11,694.80	13,111.70	10,373.39	123.81	54.71	89.75	-6,998.31	504.69	1,396.61	1,284.38	112.23	12.444		
18,800.00	11,695.45	13,045.00	10,374.87	125.37	53.69	86.61	-7,064.83	509.44	1,398.40	1,285.41	112.99	12.376		
18,900.00	11,696.11	12,981.00	10,374.84	126.94	52.71	83.30	-7,128.52	515.64	1,403.13	1,289.35	113.78	12.332		
19,000.00	11,696.76	12,906.07	10,373.51	128.51	51.57	81.09	-7,202.99	523.89	1,410.10	1,295.60	114.50	12.315		
19,100.00	11,697.41	12,803.83	10,370.60	130.08	50.03	81.38	-7,304.67	534.05	1,417.69	1,302.65	115.03	12.324		
19,200.00	11,698.07	12,707.31	10,367.14	131.65	48.59	81.15	-7,400.82	541.87	1,425.13	1,309.64	115.50	12.339		
19,300.00	11,698.72	12,620.88	10,363.40	133.22	47.31	80.05	-7,486.89	548.72	1,433.18	1,317.19	115.99	12.356		
19,400.00	11,699.37	12,510.05	10,358.08	134.80	45.69	81.05	-7,597.27	557.10	1,441.50	1,325.16	116.34	12.391		
19,500.00	11,700.02	12,357.19	10,352.66	136.37	43.50	85.61	-7,749.84	564.58	1,447.50	1,331.20	116.31	12.445		
19,600.00	11,700.68	12,230.90	10,352.48	137.95	41.72	87.87	-7,875.97	570.83	1,450.44	1,333.87	116.57	12.443		
19,700.00	11,701.33	12,144.42	10,352.94	139.53	40.52	86.74	-7,962.32	575.64	1,453.15	1,335.97	117.18	12.401		
19,800.00	11,701.98	12,049.11	10,353.08	141.11	39.21	86.36	-8,057.44	581.56	1,456.50	1,338.74	117.76	12.368		
19,900.00	11,702.63	11,895.36	10,355.37	142.70	37.16	90.82	-8,210.89	590.77	1,458.79	1,340.75	118.04	12.358		
20,000.00	11,703.29	11,780.13	10,360.36	144.28	35.66	92.06	-8,325.93	595.17	1,457.26	1,338.71	118.55	12.292		
20,100.00	11,703.94	11,677.26	10,363.63	145.87	34.36	92.28	-8,428.71	597.84	1,456.28	1,337.20	119.09	12.229		
20,200.00	11,704.59	11,546.04	10,368.59	147.46	32.78	94.81	-8,559.83	598.29	1,453.65	1,334.36	119.29	12.185		
20,300.00	11,705.25	11,471.83	10,371.24	149.05	31.91	92.71	-8,633.99	598.11	1,451.00	1,330.96	120.04	12.088		
20,400.00	11,705.90	11,368.28	10,373.60	150.64	30.75	93.00	-8,737.51	597.23	1,449.17	1,328.69	120.47	12.029		
20,500.00	11,706.55	11,266.60	10,375.25	152.24	29.68	93.14	-8,839.15	594.84	1,447.19	1,326.32	120.87	11.973		

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 216Y - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 111-VESSI_GYRO_DROP, 4375-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning			
Measured Dep th (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)				Between Centres (usft)	Between Ellipses (usft)	
20,6(0.00)	11,707.20	11,159.52	10,376.71	153.83	28.61	93.74	-8,946.15	590.84	1,444.76	1,323.58	121.18	11.923		
20,7(0.00)	11,707.86	11,063.24	10,377.33	155.43	27.72	93.45	-9,042.30	586.07	1,442.39	1,320.83	121.56	11.866		
20,8(0.00)	11,708.51	10,967.56	10,377.63	157.02	26.90	93.10	-9,137.84	580.76	1,440.06	1,318.11	121.95	11.809		
20,9(0.00)	11,709.16	10,888.46	10,377.33	158.62	26.27	91.35	-9,216.85	577.15	1,438.81	1,316.25	122.56	11.740		
20,9(0.53)	11,709.43	10,855.56	10,376.96	159.27	26.02	90.70	-9,249.73	575.88	1,438.70	1,315.89	122.81	11.715		
21,0(0.00)	11,709.82	10,807.29	10,376.13	160.22	25.67	89.75	-9,297.95	574.12	1,438.93	1,315.76	123.17	11.682		
21,1(0.00)	11,710.47	10,753.11	10,374.57	161.82	25.29	85.86	-9,352.09	572.42	1,440.91	1,316.96	123.95	11.624		
21,2(0.00)	11,711.12	10,710.00	10,371.46	163.42	25.00	81.06	-9,395.07	571.85	1,447.02	1,322.32	124.70	11.604 SF		
21,3(0.00)	11,711.77	10,678.00	10,367.76	165.03	24.80	75.50	-9,426.85	571.71	1,457.36	1,332.04	125.32	11.629		
21,4(0.00)	11,712.43	10,647.00	10,362.48	166.63	24.60	70.12	-9,457.39	572.00	1,472.59	1,346.86	125.74	11.712		
21,5(0.00)	11,713.08	10,631.89	10,359.17	168.23	24.51	63.98	-9,472.13	572.29	1,492.62	1,366.70	125.92	11.853		
21,6(0.00)	11,713.73	10,615.00	10,354.88	169.84	24.41	58.54	-9,488.46	572.73	1,517.67	1,391.81	125.87	12.058		
21,6(6.46)	11,714.10	10,584.00	10,345.79	170.75	24.22	56.96	-9,518.07	574.02	1,533.80	1,407.95	125.85	12.188		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 217H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 100-VESS_GYROFLEX, 4364-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,100.00	2,100.00	14,984.00	10,360.15	7.30	82.37	162.08	-5,246.35	1,696.41	9,984.75	9,939.44	45.31	220.389	
2,200.00	2,200.00	14,984.00	10,360.15	7.66	82.37	162.08	-5,246.35	1,696.41	9,901.53	9,856.01	45.52	217.505	
2,300.00	2,300.00	14,984.00	10,360.15	8.02	82.37	162.08	-5,246.35	1,696.41	9,818.63	9,772.88	45.75	214.631	
2,400.00	2,400.00	14,984.00	10,360.15	8.38	82.37	162.08	-5,246.35	1,696.41	9,736.05	9,690.07	45.97	211.769	
2,500.00	2,500.00	14,984.00	10,360.15	8.74	82.37	162.08	-5,246.35	1,696.41	9,653.79	9,607.59	46.21	208.919	
2,600.00	2,600.00	14,984.00	10,360.15	9.10	82.37	162.08	-5,246.35	1,696.41	9,571.88	9,525.43	46.45	206.084	
2,700.00	2,700.00	14,984.00	10,360.15	9.45	82.37	162.08	-5,246.35	1,696.41	9,490.31	9,443.62	46.69	203.264	
2,800.00	2,800.00	14,984.00	10,360.15	9.81	82.37	162.08	-5,246.35	1,696.41	9,409.10	9,362.16	46.94	200.460	
2,900.00	2,900.00	14,984.00	10,360.15	10.17	82.37	162.08	-5,246.35	1,696.41	9,328.26	9,281.06	47.19	197.672	
3,000.00	3,000.00	14,984.00	10,360.15	10.53	82.37	162.08	-5,246.35	1,696.41	9,247.78	9,200.34	47.45	194.903	
3,100.00	3,100.00	14,984.00	10,360.15	10.89	82.37	162.08	-5,246.35	1,696.41	9,167.70	9,119.99	47.71	192.152	
3,200.00	3,200.00	14,984.00	10,360.15	11.25	82.37	162.08	-5,246.35	1,696.41	9,088.00	9,040.02	47.98	189.420	
3,300.00	3,300.00	14,984.00	10,360.15	11.61	82.37	162.08	-5,246.35	1,696.41	9,008.72	8,960.46	48.25	186.708	
3,400.00	3,400.00	14,984.00	10,360.15	11.96	82.37	162.08	-5,246.35	1,696.41	8,929.84	8,881.32	48.53	184.017	
3,500.00	3,500.00	14,984.00	10,360.15	12.32	82.37	162.08	-5,246.35	1,696.41	8,851.40	8,802.59	48.81	181.347	
3,600.00	3,600.00	14,984.00	10,360.15	12.68	82.37	162.08	-5,246.35	1,696.41	8,773.39	8,724.30	49.10	178.698	
3,700.00	3,700.00	14,984.00	10,360.15	13.04	82.37	162.08	-5,246.35	1,696.41	8,695.83	8,646.45	49.39	176.072	
3,800.00	3,800.00	14,984.00	10,360.15	13.40	82.37	162.08	-5,246.35	1,696.41	8,618.74	8,569.06	49.68	173.468	
3,900.00	3,900.00	14,984.00	10,360.15	13.76	82.37	162.08	-5,246.35	1,696.41	8,542.12	8,492.14	49.99	170.888	
4,000.00	4,000.00	14,984.00	10,360.15	14.11	82.37	162.08	-5,246.35	1,696.41	8,465.99	8,415.70	50.29	168.331	
4,100.00	4,100.00	14,984.00	10,360.15	14.47	82.37	162.08	-5,246.35	1,696.41	8,390.36	8,339.75	50.61	165.798	
4,200.00	4,200.00	14,984.00	10,360.15	14.83	82.37	162.08	-5,246.35	1,696.41	8,315.24	8,264.32	50.92	163.290	
4,300.00	4,300.00	14,984.00	10,360.15	15.19	82.37	162.08	-5,246.35	1,696.41	8,240.66	8,189.41	51.25	160.807	
4,400.00	4,400.00	14,984.00	10,360.15	15.55	82.37	162.08	-5,246.35	1,696.41	8,166.61	8,115.04	51.57	158.350	
4,500.00	4,500.00	14,984.00	10,360.15	15.91	82.37	162.08	-5,246.35	1,696.41	8,093.13	8,041.22	51.91	155.918	
4,600.00	4,600.00	14,984.00	10,360.15	16.27	82.37	162.08	-5,246.35	1,696.41	8,020.22	7,967.97	52.24	153.513	
4,700.00	4,700.00	14,984.00	10,360.15	16.62	82.37	162.08	-5,246.35	1,696.41	7,947.90	7,895.31	52.59	151.134	
4,800.00	4,800.00	14,984.00	10,360.15	16.98	82.37	162.08	-5,246.35	1,696.41	7,876.18	7,823.24	52.94	148.783	
4,900.00	4,900.00	14,984.00	10,360.15	17.34	82.37	162.08	-5,246.35	1,696.41	7,805.08	7,751.79	53.29	146.459	
5,000.00	5,000.00	14,984.00	10,360.15	17.70	82.37	162.08	-5,246.35	1,696.41	7,734.63	7,680.98	53.65	144.163	
5,100.00	5,100.00	14,984.00	10,360.15	18.06	82.37	162.08	-5,246.35	1,696.41	7,665.46	7,611.44	54.02	141.906	
5,200.00	5,199.96	14,984.00	10,360.15	18.41	82.37	162.08	-5,246.35	1,696.41	7,598.27	7,543.88	54.39	139.694	
5,300.00	5,299.86	14,984.00	10,360.15	18.77	82.37	162.08	-5,246.35	1,696.41	7,533.12	7,478.35	54.78	137.523	
5,400.00	5,399.68	14,984.00	10,360.15	19.13	82.37	162.08	-5,246.35	1,696.41	7,470.10	7,414.93	55.17	135.396	
5,500.00	5,499.37	14,984.00	10,360.15	19.49	82.37	162.07	-5,246.35	1,696.41	7,409.27	7,353.69	55.58	133.316	
5,600.00	5,598.90	14,984.00	10,360.15	19.84	82.37	162.07	-5,246.35	1,696.41	7,350.70	7,294.71	55.99	131.282	
5,600.13	5,599.03	14,984.00	10,360.15	19.84	82.37	162.07	-5,246.35	1,696.41	7,350.63	7,294.64	55.99	131.280	
5,700.00	5,698.36	14,984.00	10,360.15	20.20	82.37	162.07	-5,246.35	1,696.41	7,293.76	7,237.35	56.42	129.288	
5,800.00	5,797.81	14,984.00	10,360.15	20.56	82.37	162.06	-5,246.35	1,696.41	7,237.75	7,180.91	56.85	127.324	
5,900.00	5,897.26	14,984.00	10,360.15	20.92	82.37	162.06	-5,246.35	1,696.41	7,182.70	7,125.42	57.28	125.394	
6,000.00	5,996.71	14,984.00	10,360.15	21.28	82.37	162.06	-5,246.35	1,696.41	7,128.62	7,070.90	57.72	123.500	
6,100.00	6,096.16	14,984.00	10,360.15	21.65	82.37	162.05	-5,246.35	1,696.41	7,075.55	7,017.38	58.17	121.641	
6,200.00	6,195.62	14,984.00	10,360.15	22.01	82.37	162.05	-5,246.35	1,696.41	7,023.49	6,964.87	58.62	119.818	
6,300.00	6,295.07	14,984.00	10,360.15	22.37	82.37	162.04	-5,246.35	1,696.41	6,972.49	6,913.41	59.07	118.030	
6,400.00	6,394.52	14,984.00	10,360.15	22.74	82.37	162.04	-5,246.35	1,696.41	6,922.55	6,863.01	59.53	116.278	
6,500.00	6,493.97	14,984.00	10,360.15	23.11	82.37	162.04	-5,246.35	1,696.41	6,873.70	6,813.70	60.00	114.563	
6,600.00	6,593.42	14,984.00	10,360.15	23.47	82.37	162.03	-5,246.35	1,696.41	6,825.97	6,765.50	60.47	112.885	
6,700.00	6,692.88	14,984.00	10,360.15	23.84	82.37	162.03	-5,246.35	1,696.41	6,779.38	6,718.43	60.94	111.243	
6,800.00	6,792.33	14,984.00	10,360.15	24.21	82.37	162.03	-5,246.35	1,696.41	6,733.95	6,672.53	61.42	109.638	
6,900.00	6,891.78	14,984.00	10,360.15	24.58	82.37	162.02	-5,246.35	1,696.41	6,689.70	6,627.80	61.90	108.071	
7,000.00	6,991.23	14,984.00	10,360.15	24.95	82.37	162.02	-5,246.35	1,696.41	6,646.67	6,584.29	62.39	106.541	
7,100.00	7,090.68	14,984.00	10,360.15	25.32	82.37	162.02	-5,246.35	1,696.41	6,604.87	6,542.00	62.87	105.049	

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



MS Energy Services

Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 217H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Surve / Program: 100-VESSI_GYROFLEX, 4364-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured Depth (usf)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
7,200.00	7,190.14	14,984.00	10,360.15	25.69	82.37	162.01	-5,246.35	1,696.41	6,564.33	6,500.97	63.37	103.594	
7,300.00	7,289.59	14,984.00	10,360.15	26.07	82.37	162.01	-5,246.35	1,696.41	6,525.07	6,461.21	63.86	102.178	
7,400.00	7,389.04	14,984.00	10,360.15	26.44	82.37	162.00	-5,246.35	1,696.41	6,487.11	6,422.76	64.36	100.799	
7,500.00	7,488.49	14,984.00	10,360.15	26.81	82.37	162.00	-5,246.35	1,696.41	6,450.48	6,385.63	64.86	99.458	
7,600.00	7,587.94	14,984.00	10,360.15	27.18	82.37	162.00	-5,246.35	1,696.41	6,415.20	6,349.85	65.36	98.156	
7,700.00	7,687.40	14,984.00	10,360.15	27.56	82.37	161.99	-5,246.35	1,696.41	6,381.30	6,315.44	65.86	96.891	
7,800.00	7,786.85	14,984.00	10,360.15	27.93	82.37	161.99	-5,246.35	1,696.41	6,348.78	6,282.42	66.36	95.665	
7,841.35	7,827.97	14,984.00	10,360.15	28.09	82.37	161.99	-5,246.35	1,696.41	6,335.75	6,269.18	66.57	95.169	
7,900.00	7,886.33	14,984.00	10,360.15	28.31	82.37	161.99	-5,246.35	1,696.41	6,317.40	6,250.53	66.87	94.473	
8,000.00	7,985.96	14,984.00	10,360.15	28.68	82.37	161.98	-5,246.35	1,696.41	6,285.93	6,218.55	67.37	93.300	
8,100.00	8,085.73	14,984.00	10,360.15	29.05	82.37	161.98	-5,246.35	1,696.41	6,254.23	6,186.36	67.87	92.144	
8,200.00	8,185.60	14,984.00	10,360.15	29.41	82.37	161.98	-5,246.35	1,696.41	6,222.32	6,153.95	68.37	91.007	
8,300.00	8,285.54	14,984.00	10,360.15	29.77	82.37	161.98	-5,246.35	1,696.41	6,190.20	6,121.34	68.87	89.886	
8,400.00	8,385.52	14,984.00	10,360.15	30.13	82.37	161.98	-5,246.35	1,696.41	6,157.88	6,088.52	69.36	88.784	
8,444.48	8,427.00	14,984.00	10,360.15	30.28	82.37	161.98	-5,246.35	1,696.41	6,144.41	6,074.85	69.56	88.331	
8,500.00	8,485.52	14,984.00	10,360.15	30.49	82.37	161.98	-5,246.35	1,696.41	6,125.64	6,055.79	69.85	87.702	
8,600.00	8,585.52	14,984.00	10,360.15	30.84	82.37	161.98	-5,246.35	1,696.41	6,094.73	6,024.40	70.33	86.656	
8,700.00	8,685.52	14,984.00	10,360.15	31.19	82.37	161.98	-5,246.35	1,696.41	6,065.31	5,994.49	70.82	85.646	
8,800.00	8,785.52	14,984.00	10,360.15	31.55	82.37	161.98	-5,246.35	1,696.41	6,037.40	5,966.10	71.30	84.673	
8,900.00	8,885.52	14,984.00	10,360.15	31.90	82.37	161.98	-5,246.35	1,696.41	6,011.03	5,939.24	71.79	83.736	
9,000.00	8,985.52	14,984.00	10,360.15	32.26	82.37	161.98	-5,246.35	1,696.41	5,986.21	5,913.95	72.27	82.835	
9,100.00	9,085.52	14,984.00	10,360.15	32.61	82.37	161.98	-5,246.35	1,696.41	5,962.97	5,890.22	72.75	81.970	
9,200.00	9,185.52	14,984.00	10,360.15	32.97	82.37	161.98	-5,246.35	1,696.41	5,941.32	5,868.10	73.22	81.142	
9,300.00	9,285.52	14,984.00	10,360.15	33.32	82.37	161.98	-5,246.35	1,696.41	5,921.27	5,847.58	73.69	80.349	
9,400.00	9,385.52	14,984.00	10,360.15	33.68	82.37	161.98	-5,246.35	1,696.41	5,902.86	5,828.70	74.16	79.593	
9,500.00	9,485.52	14,984.00	10,360.15	34.03	82.37	161.98	-5,246.35	1,696.41	5,886.09	5,811.46	74.63	78.871	
9,600.00	9,585.52	14,984.00	10,360.15	34.38	82.37	161.98	-5,246.35	1,696.41	5,870.97	5,795.88	75.09	78.186	
9,700.00	9,685.52	14,984.00	10,360.15	34.74	82.37	161.98	-5,246.35	1,696.41	5,857.52	5,781.97	75.55	77.536	
9,800.00	9,785.52	14,984.00	10,360.15	35.09	82.37	161.98	-5,246.35	1,696.41	5,845.75	5,769.75	76.00	76.920	
9,900.00	9,885.52	14,984.00	10,360.15	35.45	82.37	161.98	-5,246.35	1,696.41	5,835.67	5,759.22	76.44	76.340	
10,000.00	9,985.52	14,984.00	10,360.15	35.81	82.37	161.98	-5,246.35	1,696.41	5,827.29	5,750.40	76.88	75.794	
10,100.00	10,085.52	14,984.00	10,360.15	36.16	82.37	161.98	-5,246.35	1,696.41	5,820.61	5,743.30	77.32	75.283	
10,200.00	10,185.52	14,984.00	10,360.15	36.52	82.37	161.98	-5,246.35	1,696.41	5,815.65	5,737.91	77.74	74.805	
10,300.00	10,285.52	14,984.00	10,360.15	36.87	82.37	161.98	-5,246.35	1,696.41	5,812.40	5,734.24	78.16	74.361	
10,400.00	10,385.52	14,984.00	10,360.15	37.23	82.37	161.98	-5,246.35	1,696.41	5,810.88	5,732.30	78.58	73.950	
10,436.73	10,424.25	14,984.00	10,360.15	37.36	82.37	161.98	-5,246.35	1,696.41	5,810.75	5,732.01	78.74	73.799	
10,500.00	10,485.52	14,984.00	10,360.15	37.58	82.37	161.98	-5,246.35	1,696.41	5,811.07	5,732.09	78.99	73.571	
10,600.00	10,585.52	14,984.00	10,360.15	37.94	82.37	161.98	-5,246.35	1,696.41	5,812.99	5,733.60	79.38	73.225	
10,700.00	10,685.52	14,984.00	10,360.15	38.29	82.37	161.98	-5,246.35	1,696.41	5,816.62	5,736.84	79.78	72.911	
10,800.00	10,785.52	14,984.00	10,360.15	38.65	82.37	161.98	-5,246.35	1,696.41	5,821.97	5,741.81	80.16	72.629	
10,900.00	10,885.52	14,984.00	10,360.15	39.00	82.37	161.98	-5,246.35	1,696.41	5,829.03	5,748.49	80.54	72.377	
11,000.00	10,985.52	14,984.00	10,360.15	39.36	82.37	161.98	-5,246.35	1,696.41	5,837.79	5,756.89	80.91	72.155	
11,092.52	11,078.05	14,984.00	10,360.15	39.69	82.37	161.98	-5,246.35	1,696.41	5,847.41	5,766.17	81.24	71.977	
11,100.00	11,085.52	14,984.00	10,360.15	39.71	82.37	161.98	-5,246.35	1,696.41	5,848.21	5,766.94	81.27	71.964	
11,150.00	11,135.43	14,984.00	10,360.15	39.87	82.37	161.97	-5,246.35	1,696.41	5,851.39	5,769.96	81.43	71.857	
11,200.00	11,184.89	14,984.00	10,360.15	40.02	82.37	161.95	-5,246.35	1,696.41	5,850.85	5,769.24	81.60	71.698	
11,250.00	11,233.55	14,984.00	10,360.15	40.16	82.37	161.91	-5,246.35	1,696.41	5,846.58	5,764.80	81.78	71.490	
11,300.00	11,281.02	14,984.00	10,360.15	40.29	82.37	161.86	-5,246.35	1,696.41	5,838.63	5,756.66	81.96	71.234	
11,350.00	11,326.95	14,984.00	10,360.15	40.41	82.37	161.80	-5,246.35	1,696.41	5,827.02	5,744.88	82.15	70.932	
11,400.00	11,370.98	14,984.00	10,360.15	40.53	82.37	161.73	-5,246.35	1,696.41	5,811.84	5,729.50	82.33	70.588	
11,450.00	11,412.78	14,984.00	10,360.15	40.63	82.37	161.64	-5,246.35	1,696.41	5,793.16	5,710.64	82.52	70.203	
11,500.00	11,452.03	14,984.00	10,360.15	40.73	82.37	161.55	-5,246.35	1,696.41	5,771.09	5,688.39	82.70	69.780	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 217H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-VESSI_GYROFLEX, 4364-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis			Distance							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
11,550.00	11,488.44	14,984.00	10,360.15	40.82	82.37	161.44	-5,246.35	1,696.41	5,745.77	5,662.88	82.89	69.320		
11,600.00	11,521.73	14,984.00	10,360.15	40.91	82.37	161.31	-5,246.35	1,696.41	5,717.34	5,634.27	83.07	68.826		
11,650.00	11,551.64	14,984.00	10,360.15	40.99	82.37	161.18	-5,246.35	1,696.41	5,685.98	5,602.74	83.25	68.301		
11,700.00	11,577.94	14,984.00	10,360.15	41.08	82.37	161.04	-5,246.35	1,696.41	5,651.89	5,568.46	83.43	67.746		
11,750.00	11,600.44	14,984.00	10,360.15	41.17	82.37	160.89	-5,246.35	1,696.41	5,615.26	5,531.65	83.60	67.165		
11,800.00	11,618.96	14,984.00	10,360.15	41.27	82.37	160.73	-5,246.35	1,696.41	5,576.33	5,492.55	83.78	66.559		
11,850.00	11,633.37	14,984.00	10,360.15	41.37	82.37	160.56	-5,246.35	1,696.41	5,535.36	5,451.40	83.96	65.931		
11,900.00	11,643.55	14,984.00	10,360.15	41.48	82.37	160.39	-5,246.35	1,696.41	5,492.61	5,408.48	84.13	65.285		
11,950.00	11,649.43	14,984.00	10,360.15	41.58	82.37	160.21	-5,246.35	1,696.41	5,448.37	5,364.06	84.31	64.622		
11,988.78	11,650.99	14,984.00	10,360.15	41.67	82.37	160.06	-5,246.35	1,696.41	5,413.23	5,328.78	84.45	64.099		
12,000.00	11,651.07	14,984.00	10,360.15	41.69	82.37	160.02	-5,246.35	1,696.41	5,402.98	5,318.49	84.49	63.946		
12,100.00	11,651.72	14,984.00	10,360.15	41.96	82.37	159.64	-5,246.35	1,696.41	5,311.75	5,226.89	84.86	62.592		
12,200.00	11,652.37	14,984.00	10,360.15	42.28	82.37	159.25	-5,246.35	1,696.41	5,220.85	5,135.60	85.26	61.238		
12,300.00	11,653.02	14,984.00	10,360.15	42.67	82.37	158.84	-5,246.35	1,696.41	5,130.29	5,044.62	85.67	59.882		
12,400.00	11,653.68	14,984.00	10,360.15	43.12	82.37	158.42	-5,246.35	1,696.41	5,040.08	4,953.97	86.12	58.526		
12,500.00	11,654.33	14,984.00	10,360.15	43.62	82.37	157.98	-5,246.35	1,696.41	4,950.26	4,863.67	86.59	57.169		
12,600.00	11,654.98	14,984.00	10,360.15	44.19	82.37	157.52	-5,246.35	1,696.41	4,860.82	4,773.73	87.09	55.813		
12,700.00	11,655.64	14,984.00	10,360.15	44.80	82.37	157.05	-5,246.35	1,696.41	4,771.81	4,684.18	87.63	54.457		
12,800.00	11,656.29	14,984.00	10,360.15	45.47	82.37	156.56	-5,246.35	1,696.41	4,683.24	4,595.05	88.19	53.102		
12,900.00	11,656.94	14,984.00	10,360.15	46.19	82.37	156.04	-5,246.35	1,696.41	4,595.14	4,506.34	88.80	51.749		
13,000.00	11,657.59	14,984.00	10,360.15	46.95	82.37	155.50	-5,246.35	1,696.41	4,507.54	4,418.10	89.44	50.398		
13,100.00	11,658.25	14,984.00	10,360.15	47.76	82.37	154.94	-5,246.35	1,696.41	4,420.46	4,330.34	90.12	49.049		
13,200.00	11,658.90	14,984.00	10,360.15	48.62	82.37	154.36	-5,246.35	1,696.41	4,333.94	4,243.09	90.85	47.704		
13,300.00	11,659.55	14,984.00	10,360.15	49.51	82.37	153.75	-5,246.35	1,696.41	4,248.01	4,156.39	91.63	46.363		
13,400.00	11,660.20	14,984.00	10,360.15	50.44	82.37	153.11	-5,246.35	1,696.41	4,162.71	4,070.26	92.45	45.027		
13,500.00	11,660.86	14,984.00	10,360.15	51.41	82.37	152.45	-5,246.35	1,696.41	4,078.08	3,984.75	93.33	43.697		
13,600.00	11,661.51	14,984.00	10,360.15	52.41	82.37	151.75	-5,246.35	1,696.41	3,994.16	3,899.90	94.26	42.374		
13,700.00	11,662.16	14,984.00	10,360.15	53.45	82.37	151.02	-5,246.35	1,696.41	3,911.00	3,815.74	95.25	41.059		
13,800.00	11,662.82	14,984.00	10,360.15	54.52	82.37	150.25	-5,246.35	1,696.41	3,828.64	3,732.33	96.31	39.754		
13,900.00	11,663.47	14,984.00	10,360.15	55.61	82.37	149.45	-5,246.35	1,696.41	3,747.14	3,649.71	97.43	38.460		
14,000.00	11,664.12	14,984.00	10,360.15	56.73	82.37	148.60	-5,246.35	1,696.41	3,666.55	3,567.93	98.62	37.178		
14,100.00	11,664.77	14,984.00	10,360.15	57.88	82.37	147.72	-5,246.35	1,696.41	3,586.95	3,487.06	99.88	35.911		
14,200.00	11,665.43	14,984.00	10,360.15	59.05	82.37	146.78	-5,246.35	1,696.41	3,508.38	3,407.16	101.23	34.659		
14,300.00	11,666.08	14,984.00	10,360.15	60.25	82.37	145.80	-5,246.35	1,696.41	3,430.94	3,328.29	102.65	33.425		
14,400.00	11,666.73	14,984.00	10,360.15	61.46	82.37	144.77	-5,246.35	1,696.41	3,354.68	3,250.53	104.15	32.210		
14,500.00	11,667.39	14,984.00	10,360.15	62.70	82.37	143.68	-5,246.35	1,696.41	3,279.71	3,173.97	105.74	31.017		
14,600.00	11,668.04	14,984.00	10,360.15	63.95	82.37	142.53	-5,246.35	1,696.41	3,206.09	3,098.68	107.42	29.847		
14,700.00	11,668.69	14,984.00	10,360.15	65.23	82.37	141.32	-5,246.35	1,696.41	3,133.95	3,024.76	109.18	28.704		
14,800.00	11,669.34	14,984.00	10,360.15	66.52	82.37	140.04	-5,246.35	1,696.41	3,063.36	2,952.32	111.04	27.588		
14,900.00	11,670.00	14,984.00	10,360.15	67.82	82.37	138.69	-5,246.35	1,696.41	2,994.45	2,881.47	112.98	26.503		
15,000.00	11,670.65	14,984.00	10,360.15	69.14	82.37	137.26	-5,246.35	1,696.41	2,927.34	2,812.32	115.02	25.451		
15,100.00	11,671.30	14,984.00	10,360.15	70.48	82.37	135.75	-5,246.35	1,696.41	2,862.15	2,745.01	117.14	24.433		
15,200.00	11,671.95	14,984.00	10,360.15	71.83	82.37	134.15	-5,246.35	1,696.41	2,799.01	2,679.66	119.35	23.452		
15,300.00	11,672.61	14,984.00	10,360.15	73.19	82.37	132.47	-5,246.35	1,696.41	2,738.07	2,616.44	121.63	22.511		
15,400.00	11,673.26	14,984.00	10,360.15	74.56	82.37	130.68	-5,246.35	1,696.41	2,679.48	2,555.50	123.98	21.611		
15,500.00	11,673.91	14,984.00	10,360.15	75.94	82.37	128.80	-5,246.35	1,696.41	2,623.39	2,496.99	126.40	20.755		
15,600.00	11,674.57	14,984.00	10,360.15	77.34	82.37	126.81	-5,246.35	1,696.41	2,569.97	2,441.11	128.86	19.944		
15,700.00	11,675.22	14,984.00	10,360.15	78.74	82.37	124.71	-5,246.35	1,696.41	2,519.39	2,388.03	131.36	19.180		
15,800.00	11,675.87	14,984.00	10,360.15	80.16	82.37	122.50	-5,246.35	1,696.41	2,471.82	2,337.95	133.87	18.464		
15,900.00	11,676.52	14,984.00	10,360.15	81.58	82.37	120.18	-5,246.35	1,696.41	2,427.44	2,291.06	136.38	17.799		
16,000.00	11,677.18	14,984.00	10,360.15	83.01	82.37	117.74	-5,246.35	1,696.41	2,386.43	2,247.56	138.87	17.184		
16,100.00	11,677.83	14,984.00	10,360.15	84.46	82.37	115.19	-5,246.35	1,696.41	2,348.96	2,207.65	141.31	16.623		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offs at Design Cotton Draw Unit - 217H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey / Program: 100-VESSI GYROFLEX, 4364-MWD													Offset Well Error: 0.00 usft
Reference													
Offset													
Semi Major Axis													
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Distance Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
16,200.00	11,678.48	14,984.00	10,360.15	85.90	82.37	112.52	-5,246.35	1,696.41	2,315.21	2,171.53	143.68	16.114	
16,300.00	11,679.13	14,984.00	10,360.15	87.36	82.37	109.75	-5,246.35	1,696.41	2,285.34	2,139.39	145.95	15.659	
16,400.00	11,679.79	14,984.00	10,360.15	88.82	82.37	106.88	-5,246.35	1,696.41	2,259.50	2,111.41	148.08	15.258	
16,500.00	11,680.44	14,984.00	10,360.15	90.29	82.37	103.91	-5,246.35	1,696.41	2,237.84	2,087.77	150.07	14.912	
16,600.00	11,681.09	14,984.00	10,360.15	91.77	82.37	100.87	-5,246.35	1,696.41	2,220.47	2,068.60	151.87	14.621	
16,700.00	11,681.75	14,984.00	10,360.15	93.25	82.37	97.77	-5,246.35	1,696.41	2,207.50	2,054.03	153.47	14.384	
16,800.00	11,682.40	14,984.00	10,360.15	94.74	82.37	94.62	-5,246.35	1,696.41	2,199.01	2,044.16	154.85	14.201	
16,900.00	11,683.05	14,926.50	10,359.44	96.23	81.46	93.31	-5,304.71	1,692.53	2,194.26	2,039.04	155.22	14.136	
17,000.00	11,683.70	14,830.58	10,358.60	97.73	79.96	93.15	-5,399.46	1,686.85	2,190.24	2,035.16	155.07	14.124	
17,100.00	11,684.36	14,741.09	10,359.12	99.23	78.56	92.82	-5,488.84	1,682.34	2,186.17	2,031.11	155.06	14.099	
17,200.00	11,685.01	14,650.96	10,358.00	100.74	77.15	92.51	-5,578.83	1,677.55	2,182.91	2,027.92	155.00	14.084	
17,300.00	11,685.66	14,559.85	10,355.95	102.25	75.73	92.22	-5,669.76	1,672.16	2,179.79	2,024.90	154.89	14.073	
17,400.00	11,686.32	14,445.79	10,353.15	103.77	73.95	92.68	-5,783.61	1,665.90	2,177.19	2,022.70	154.49	14.093	
17,500.00	11,686.97	14,344.64	10,352.86	105.29	72.38	92.72	-5,884.61	1,660.56	2,173.46	2,019.13	154.33	14.083	
17,600.00	11,687.62	14,258.78	10,352.43	106.81	71.05	92.26	-5,970.38	1,656.53	2,170.32	2,015.94	154.37	14.059	
17,700.00	11,688.27	14,101.61	10,353.41	108.34	68.62	94.13	-6,127.32	1,648.25	2,166.00	2,012.48	153.51	14.110	
17,800.00	11,688.93	14,033.93	10,354.16	109.88	67.58	93.08	-6,194.89	1,644.55	2,161.30	2,007.45	153.85	14.048	
17,900.00	11,689.58	13,900.00	10,354.46	111.41	126.95	93.64	-6,311.62	1,638.67	2,157.56	1,952.21	205.34	10.507	
18,000.00	11,690.23	13,791.72	10,358.55	112.95	63.87	94.48	-6,436.71	1,632.80	2,152.23	1,999.04	153.19	14.049	
18,100.00	11,690.88	13,698.98	10,362.81	114.49	62.46	94.24	-6,529.27	1,628.91	2,146.52	1,993.19	153.33	13.999	
18,200.00	11,691.54	13,598.82	10,367.47	116.04	60.93	94.25	-6,629.25	1,624.94	2,140.96	1,987.57	153.39	13.958	
18,300.00	11,692.19	13,507.90	10,371.96	117.59	59.56	93.95	-6,719.99	1,621.59	2,135.46	1,981.88	153.58	13.904	
18,400.00	11,692.84	13,434.42	10,374.81	119.14	58.45	93.07	-6,793.37	1,619.00	2,130.77	1,976.80	153.97	13.839	
18,500.00	11,693.50	13,372.00	10,376.48	120.70	57.51	91.83	-6,855.75	1,617.52	2,127.67	1,973.21	154.46	13.775	
18,600.00	11,694.15	13,302.61	10,377.35	122.25	56.47	90.81	-6,925.13	1,616.54	2,126.18	1,971.34	154.84	13.732	
18,700.00	11,694.80	13,174.53	10,378.86	123.81	54.57	91.74	-7,053.18	1,615.19	2,125.09	1,970.48	154.61	13.745	
18,800.00	11,695.45	13,102.68	10,380.00	125.37	53.51	90.80	-7,125.03	1,614.43	2,123.68	1,968.69	154.99	13.702	
18,900.00	11,696.11	12,978.36	10,381.43	126.94	51.69	91.62	-7,249.32	1,612.93	2,122.43	1,967.61	154.82	13.709	
19,000.00	11,696.76	12,899.00	10,382.68	128.51	50.54	90.93	-7,328.67	1,612.17	2,121.08	1,965.94	155.14	13.672	
19,065.58	11,697.21	12,848.98	10,383.13	129.60	49.82	90.27	-7,378.68	1,612.02	2,120.80	1,965.39	155.42	13.646	
19,100.00	11,697.41	12,825.96	10,383.23	130.08	49.49	90.03	-7,401.70	1,612.03	2,120.86	1,965.34	155.52	13.637	
19,200.00	11,698.07	12,664.17	10,385.47	131.65	47.18	92.09	-7,563.46	1,610.61	2,119.70	1,964.66	155.04	13.672	
19,300.00	11,698.72	12,564.83	10,388.16	133.22	45.78	92.07	-7,662.75	1,608.83	2,117.04	1,961.82	155.22	13.639	
19,400.00	11,699.37	12,463.03	10,390.02	134.80	44.36	92.13	-7,764.51	1,606.60	2,114.58	1,959.22	155.36	13.611	
19,500.00	11,700.02	12,369.25	10,391.45	136.37	43.07	91.92	-7,858.24	1,604.16	2,111.97	1,956.38	155.58	13.574	
19,600.00	11,700.68	12,284.22	10,392.49	137.95	41.92	91.42	-7,943.25	1,602.43	2,109.99	1,954.07	155.92	13.533	
19,700.00	11,701.33	12,211.00	10,393.12	139.53	40.94	90.52	-8,016.46	1,601.46	2,108.85	1,952.47	156.38	13.486	
19,717.92	11,701.45	12,200.48	10,393.08	139.82	40.80	90.27	-8,026.98	1,601.35	2,108.82	1,952.34	156.48	13.477	
19,800.00	11,701.98	11,800.00	10,391.76	141.11	141.71	89.59	-8,088.78	1,600.83	2,109.51	1,867.68	241.83	8.723 ES, SF	
19,900.00	11,702.63	12,021.16	10,386.60	142.70	38.45	90.17	-8,206.11	1,597.59	2,110.31	1,953.63	156.68	13.469	
20,000.00	11,703.29	11,928.72	10,381.93	144.28	37.27	89.91	-8,298.37	1,594.09	2,110.66	1,953.85	156.81	13.460	
20,100.00	11,703.94	11,810.66	10,376.12	145.87	35.80	90.52	-8,416.20	1,589.80	2,111.13	1,954.42	156.71	13.471	
20,200.00	11,704.59	11,647.08	10,369.96	147.46	33.83	92.67	-8,579.37	1,580.19	2,108.94	1,952.85	156.10	13.511	
20,300.00	11,705.25	11,540.82	10,367.69	149.05	32.62	92.89	-8,685.40	1,573.60	2,105.70	1,949.48	156.22	13.479	
20,400.00	11,705.90	11,389.34	10,368.63	150.64	30.95	94.66	-8,836.60	1,564.36	2,100.86	1,944.93	155.93	13.473	
20,500.00	11,706.55	11,312.14	10,370.40	152.24	30.15	93.88	-8,913.64	1,559.88	2,095.28	1,938.68	156.60	13.380	
20,600.00	11,707.20	11,195.00	10,373.55	153.83	29.00	94.48	-9,030.56	1,553.48	2,089.67	1,932.78	156.89	13.319	
20,700.00	11,707.86	11,138.18	10,375.30	155.43	28.48	92.99	-9,087.28	1,550.72	2,084.57	1,926.72	157.85	13.206	
20,800.00	11,708.51	11,082.70	10,375.49	157.02	27.98	91.45	-9,142.73	1,548.95	2,082.08	1,923.31	158.78	13.113	
20,900.00	11,709.16	10,978.90	10,375.60	158.62	27.14	91.58	-9,246.50	1,546.35	2,080.43	1,921.09	159.34	13.056	
21,000.00	11,709.82	10,880.08	10,377.46	160.22	26.41	91.54	-9,345.29	1,544.83	2,078.46	1,918.39	160.07	12.984	
21,100.00	11,710.47	10,803.75	10,378.05	161.82	25.90	90.72	-9,421.60	1,543.74	2,077.27	1,916.30	160.97	12.905	

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 217H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 100-VESSI_GYROFLEX, 4364-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance								Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
21,142.03	11,710.74	10,774.14	10,378.30	162.50	25.73	90.29	-9,451.21	1,543.67	2,077.15	1,915.77	161.38	12.871 CC		
21,200.00	11,711.12	10,733.32	10,379.10	163.42	25.50	89.69	-9,492.02	1,544.29	2,077.39	1,915.41	161.97	12.826		
21,300.00	11,711.77	10,694.82	10,379.51	165.03	25.30	87.55	-9,530.49	1,545.37	2,079.56	1,916.49	163.07	12.753		
21,400.00	11,712.43	10,663.00	10,377.72	166.63	25.15	85.19	-9,562.25	1,546.01	2,084.98	1,920.98	164.00	12.713		
21,500.00	11,713.08	10,632.00	10,373.59	168.23	25.00	82.81	-9,592.97	1,546.07	2,093.68	1,928.95	164.73	12.710		
21,600.00	11,713.73	10,600.00	10,366.40	169.84	24.86	80.46	-9,624.13	1,545.36	2,105.85	1,940.63	165.23	12.745		
21,656.46	11,714.10	10,600.00	10,366.40	170.75	24.86	78.56	-9,624.13	1,545.36	2,114.24	1,948.76	165.48	12.776		



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 272H - Wellbore #1 - Surveys													Offset Site Error:	0.00 usft
Survey Program: 85-VESSEL_GYRO_DROP_4319-MWD													Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)				
100.00	100.00	0.00	0.00	0.00	0.00	170.58	-5,092.80	844.84	5,162.53					
100.00	100.00	51.28	51.28	0.13	0.03	170.58	-5,092.87	844.80	5,162.47	5,162.31	0.17	N/A		
200.00	200.00	135.75	135.75	0.49	0.14	170.58	-5,093.24	844.64	5,162.88	5,162.24	0.64	8,122.132		
300.00	300.00	225.80	225.79	0.85	0.30	170.58	-5,093.82	844.74	5,163.53	5,162.37	1.15	4,474.894		
400.00	400.00	322.55	322.54	1.21	0.47	170.58	-5,094.56	844.89	5,164.31	5,162.63	1.68	3,066.216		
500.00	500.00	425.42	425.41	1.57	0.66	170.58	-5,095.29	845.38	5,165.09	5,162.86	2.23	2,321.198		
600.00	600.00	523.87	523.86	1.93	0.83	170.57	-5,095.92	845.99	5,165.82	5,163.06	2.76	1,873.059		
700.00	700.00	644.13	644.11	2.29	1.04	170.57	-5,096.55	846.87	5,166.47	5,163.14	3.33	1,552.325		
800.00	800.00	743.25	743.23	2.64	1.22	170.56	-5,096.78	847.81	5,166.85	5,162.99	3.86	1,338.606		
900.00	900.00	849.99	849.96	3.00	1.41	170.54	-5,096.97	848.87	5,167.19	5,162.78	4.40	1,173.139		
1,000.00	1,000.00	963.41	963.37	3.36	1.61	170.53	-5,096.95	849.92	5,167.33	5,162.37	4.96	1,041.791		
1,100.00	1,100.00	1,076.02	1,075.98	3.72	1.80	170.52	-5,096.65	850.83	5,167.20	5,161.68	5.51	937.260		
1,200.00	1,200.00	1,181.65	1,181.61	4.08	1.99	170.51	-5,096.16	851.83	5,166.89	5,160.84	6.05	853.471		
1,300.00	1,300.00	1,290.65	1,290.60	4.44	2.18	170.50	-5,095.48	853.08	5,166.47	5,159.87	6.60	782.681		
1,400.00	1,400.00	1,393.81	1,393.75	4.79	2.36	170.48	-5,094.67	854.39	5,165.91	5,158.77	7.14	723.699		
1,500.00	1,500.00	1,499.60	1,499.52	5.15	2.55	170.46	-5,093.74	855.89	5,165.27	5,157.59	7.68	672.538		
1,600.00	1,600.00	1,599.21	1,599.11	5.51	2.72	170.44	-5,092.79	857.36	5,164.58	5,156.36	8.21	628.914		
1,700.00	1,700.00	1,696.88	1,696.77	5.87	2.90	170.43	-5,091.88	858.88	5,163.92	5,155.18	8.74	590.811		
1,800.00	1,800.00	1,797.23	1,797.10	6.23	3.07	170.40	-5,090.92	860.67	5,163.27	5,154.00	9.27	556.760		
1,900.00	1,900.00	1,898.85	1,898.69	6.59	3.25	170.38	-5,089.93	862.54	5,162.62	5,152.81	9.81	526.289		
2,000.00	2,000.00	1,997.68	1,997.51	6.95	3.43	170.36	-5,088.94	864.21	5,161.92	5,151.58	10.34	499.202		
2,100.00	2,100.00	2,087.76	2,087.57	7.30	3.59	170.34	-5,088.15	865.81	5,161.35	5,150.49	10.86	475.433		
2,200.00	2,200.00	2,180.64	2,180.44	7.66	3.75	170.32	-5,087.52	867.50	5,160.98	5,149.60	11.38	453.640		
2,300.00	2,300.00	2,279.71	2,279.49	8.02	3.93	170.30	-5,086.90	869.21	5,160.65	5,148.75	11.91	433.366		
2,400.00	2,400.00	2,372.48	2,372.24	8.38	4.09	170.29	-5,086.39	870.75	5,160.39	5,147.97	12.43	415.198		
2,472.16	2,472.16	2,436.01	2,435.76	8.64	4.21	170.27	-5,086.17	871.73	5,160.33	5,147.54	12.80	403.203		
2,500.00	2,500.00	2,460.61	2,460.36	8.74	4.25	170.27	-5,086.12	872.10	5,160.34	5,147.40	12.94	398.756		
2,600.00	2,600.00	2,551.83	2,551.57	9.10	4.41	170.26	-5,086.05	873.41	5,160.51	5,147.05	13.46	383.429		
2,700.00	2,700.00	2,645.97	2,645.70	9.45	4.58	170.24	-5,086.09	874.68	5,160.78	5,146.80	13.98	369.110		
2,800.00	2,800.00	2,736.92	2,736.65	9.81	4.74	170.23	-5,086.31	875.79	5,161.22	5,146.73	14.50	355.972		
2,900.00	2,900.00	2,832.13	2,831.85	10.17	4.91	170.22	-5,086.69	876.83	5,161.81	5,146.79	15.02	343.576		
3,000.00	3,000.00	2,932.85	2,932.56	10.53	5.09	170.21	-5,087.12	877.96	5,162.42	5,146.86	15.56	331.809		
3,100.00	3,100.00	3,032.67	3,032.38	10.89	5.27	170.20	-5,087.51	879.20	5,163.02	5,146.93	16.09	320.856		
3,200.00	3,200.00	3,127.88	3,127.58	11.25	5.44	170.18	-5,087.91	880.45	5,163.65	5,147.04	16.62	310.758		
3,300.00	3,300.00	3,222.84	3,222.53	11.61	5.60	170.17	-5,088.39	881.92	5,164.41	5,147.27	17.14	301.293		
3,400.00	3,400.00	3,328.17	3,327.83	11.96	5.79	170.15	-5,088.85	884.02	5,165.19	5,147.51	17.68	292.086		
3,500.00	3,500.00	3,429.73	3,429.37	12.32	5.97	170.12	-5,089.17	886.05	5,165.84	5,147.62	18.22	283.526		
3,600.00	3,600.00	3,525.59	3,525.21	12.68	6.14	170.10	-5,089.51	887.96	5,166.54	5,147.79	18.75	275.605		
3,700.00	3,700.00	3,618.55	3,618.15	13.04	6.31	170.08	-5,089.94	889.88	5,167.34	5,148.08	19.27	268.193		
3,800.00	3,800.00	3,702.04	3,701.61	13.40	6.46	170.06	-5,090.44	891.93	5,168.36	5,148.59	19.77	261.404		
3,900.00	3,900.00	3,788.49	3,788.02	13.76	6.61	170.04	-5,091.20	894.39	5,169.72	5,149.44	20.28	254.903		
4,000.00	4,000.00	3,872.64	3,872.13	14.11	6.76	170.01	-5,092.11	896.90	5,171.30	5,150.52	20.79	248.781		
4,100.00	4,100.00	3,951.59	3,951.03	14.47	6.90	169.98	-5,093.22	899.59	5,173.28	5,151.99	21.28	243.077		
4,200.00	4,200.00	4,027.93	4,027.30	14.83	7.04	169.95	-5,094.54	902.54	5,175.66	5,153.89	21.77	237.705		
4,300.00	4,300.00	4,093.70	4,092.99	15.19	7.15	169.93	-5,096.03	905.28	5,178.63	5,156.38	22.24	232.804		
4,400.00	4,400.00	4,176.56	4,175.74	15.55	7.30	169.89	-5,098.33	908.94	5,182.13	5,159.38	22.75	227.815		
4,500.00	4,500.00	4,268.16	4,267.20	15.91	7.41	169.85	-5,101.02	913.20	5,185.84	5,162.63	23.21	223.426		
4,600.00	4,600.00	4,351.49	4,349.61	16.27	7.55	169.88	-5,083.06	925.45	5,181.02	5,157.03	23.99	215.987		
4,700.00	4,700.00	5,043.41	5,041.27	16.62	7.96	169.69	-5,076.51	923.56	5,173.64	5,149.19	24.46	211.554		
4,800.00	4,800.00	5,133.53	5,131.16	16.98	8.08	169.70	-5,070.24	921.73	5,166.43	5,141.50	24.93	207.209		
4,900.00	4,900.00	5,223.95	5,221.35	17.34	8.21	169.71	-5,064.14	919.78	5,159.41	5,133.99	25.42	202.941		
5,000.00	5,000.00	5,332.04	5,329.16	17.70	8.39	169.72	-5,056.89	917.44	5,152.42	5,126.47	25.95	198.566		

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 272H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 85-VESSEL_GYRO_DROP, 4319-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
5,100.00	5,100.00	5,432.85	5,418.06	18.06	8.56	169.73	-5,050.91	915.46	5,146.28	5,119.80	26.48	194.351			
5,200.00	5,199.96	5,521.06	5,517.72	18.41	8.72	169.73	-5,044.33	913.15	5,141.97	5,114.98	27.00	190.473			
5,300.00	5,299.86	5,621.97	5,618.38	18.77	8.92	169.74	-5,037.70	910.80	5,139.38	5,111.83	27.55	186.572			
5,400.00	5,399.68	5,736.77	5,732.89	19.13	9.16	169.74	-5,029.90	908.09	5,138.28	5,110.15	28.13	182.636			
5,416.75	5,416.38	5,752.00	5,748.08	19.19	9.20	169.74	-5,028.86	907.73	5,138.26	5,110.03	28.23	182.038			
5,500.00	5,499.37	5,862.98	5,858.76	19.49	9.44	169.74	-5,021.16	905.08	5,138.83	5,110.08	28.76	178.701			
5,600.00	5,598.90	5,964.82	5,960.27	19.84	9.68	169.74	-5,013.44	902.37	5,140.36	5,111.02	29.34	175.187			
5,600.13	5,599.03	5,964.91	5,960.36	19.84	9.68	169.74	-5,013.44	902.37	5,140.36	5,111.02	29.34	175.183			
5,700.00	5,698.36	6,040.37	6,035.59	20.20	9.86	169.74	-5,008.15	899.80	5,143.17	5,113.29	29.88	172.128			
5,800.00	5,797.81	6,115.40	6,110.42	20.56	10.04	169.74	-5,003.27	897.16	5,146.47	5,116.05	30.42	169.179			
5,900.00	5,897.26	6,191.54	6,186.37	20.92	10.23	169.74	-4,998.71	894.44	5,150.25	5,119.29	30.97	166.316			
6,000.00	5,996.71	6,324.96	6,319.47	21.28	10.58	169.75	-4,990.86	889.64	5,154.22	5,122.56	31.65	162.833			
6,100.00	6,096.16	6,484.21	6,478.21	21.65	11.01	169.78	-4,979.42	883.85	5,156.71	5,124.29	32.41	159.094			
6,200.00	6,195.62	6,577.19	6,570.86	22.01	11.27	169.78	-4,972.46	880.40	5,158.99	5,125.97	33.02	156.223			
6,300.00	6,295.07	6,659.28	6,652.67	22.37	11.50	169.78	-4,966.50	877.30	5,161.50	5,127.89	33.61	153.572			
6,400.00	6,394.52	6,778.13	6,771.11	22.74	11.84	169.79	-4,957.61	873.04	5,163.78	5,129.48	34.30	150.568			
6,500.00	6,493.97	6,850.00	6,842.77	23.11	12.05	169.79	-4,952.55	870.67	5,166.52	5,131.65	34.86	148.195			
6,600.00	6,593.42	6,921.47	6,914.05	23.47	12.27	169.78	-4,947.86	868.57	5,169.80	5,134.37	35.43	145.909			
6,700.00	6,692.88	7,002.67	6,995.06	23.84	12.51	169.77	-4,942.65	866.59	5,173.37	5,137.34	36.03	143.593			
6,800.00	6,792.33	7,196.46	7,188.30	24.21	13.10	169.79	-4,929.27	861.16	5,176.54	5,139.61	36.94	140.136			
6,900.00	6,891.78	7,297.18	7,288.65	24.58	13.41	169.79	-4,921.19	857.73	5,178.37	5,140.76	37.60	137.719			
7,000.00	6,991.23	7,370.19	7,361.41	24.95	13.64	169.78	-4,915.51	855.72	5,180.54	5,142.35	38.19	135.661			
7,100.00	7,090.68	7,441.35	7,432.36	25.32	13.87	169.77	-4,910.38	853.94	5,183.31	5,144.54	38.77	133.696			
7,200.00	7,190.14	7,521.80	7,512.60	25.69	14.12	169.76	-4,904.89	852.21	5,186.53	5,147.15	39.38	131.709			
7,300.00	7,289.59	7,614.22	7,604.80	26.07	14.41	169.75	-4,898.77	850.52	5,190.01	5,149.98	40.02	129.671			
7,400.00	7,389.04	7,705.09	7,695.47	26.44	14.71	169.73	-4,892.88	848.95	5,193.64	5,152.97	40.67	127.708			
7,500.00	7,488.49	7,768.22	7,758.47	26.81	14.91	169.71	-4,889.02	848.14	5,197.72	5,156.49	41.23	126.068			
7,600.00	7,587.94	7,799.00	7,789.20	27.18	15.00	169.69	-4,887.27	847.93	5,202.65	5,160.96	41.69	124.792			
7,700.00	7,687.40	7,863.09	7,853.22	27.56	15.21	169.67	-4,884.23	847.73	5,208.43	5,166.18	42.25	123.272			
7,800.00	7,786.85	7,893.00	7,883.11	27.93	15.30	169.65	-4,883.17	847.69	5,215.46	5,172.76	42.70	122.134			
7,841.35	7,827.97	7,921.36	7,911.46	28.09	15.39	169.64	-4,882.40	847.68	5,218.65	5,175.71	42.94	121.537			
7,900.00	7,886.33	7,944.91	7,935.01	28.31	15.46	169.63	-4,881.92	847.70	5,223.25	5,180.03	43.22	120.854			
8,000.00	7,985.96	7,988.00	7,978.09	28.68	15.59	169.61	-4,881.46	847.78	5,230.65	5,186.94	43.70	119.682			
8,100.00	8,085.73	8,066.54	8,056.63	29.05	15.83	169.59	-4,881.18	848.16	5,237.09	5,192.79	44.30	118.222			
8,200.00	8,185.60	8,150.51	8,140.60	29.41	16.07	169.57	-4,881.01	849.12	5,242.12	5,197.21	44.91	116.734			
8,300.00	8,285.54	8,225.89	8,215.96	29.77	16.29	169.55	-4,881.06	850.35	5,245.79	5,200.30	45.48	115.338			
8,400.00	8,385.52	8,309.42	8,299.49	30.13	16.53	169.55	-4,881.70	850.92	5,248.23	5,202.15	46.08	113.896			
8,441.48	8,427.00	8,353.96	8,344.02	30.28	16.66	169.55	-4,882.09	851.07	5,248.76	5,202.40	46.36	113.225			
8,500.00	8,485.52	8,417.95	8,408.02	30.49	16.84	169.54	-4,882.60	851.28	5,249.25	5,202.49	46.75	112.273			
8,600.00	8,585.52	8,522.94	8,513.00	30.84	17.15	169.54	-4,883.23	852.00	5,249.96	5,202.54	47.42	110.703			
8,700.00	8,685.52	8,597.95	8,588.01	31.19	17.37	169.53	-4,883.70	852.79	5,250.80	5,202.80	48.00	109.395			
8,800.00	8,785.52	8,664.54	8,654.58	31.55	17.56	169.53	-4,884.63	853.46	5,252.33	5,203.78	48.54	108.195			
8,900.00	8,885.52	8,821.27	8,811.30	31.90	18.03	169.51	-4,886.74	855.15	5,254.00	5,204.61	49.39	106.376			
9,000.00	8,985.52	8,995.80	8,985.81	32.26	18.58	169.50	-4,886.02	856.24	5,253.48	5,203.16	50.32	104.403			
9,100.00	9,085.52	9,070.06	9,060.07	32.61	18.81	169.49	-4,885.51	856.82	5,252.97	5,202.06	50.91	103.181			
9,129.29	9,114.82	9,088.58	9,078.59	32.72	18.87	169.49	-4,885.44	857.06	5,252.93	5,201.86	51.07	102.854			
9,200.00	9,185.52	9,139.71	9,129.71	32.97	19.03	169.48	-4,885.41	857.94	5,253.10	5,201.62	51.48	102.037			
9,300.00	9,285.52	9,267.04	9,257.04	33.32	19.43	169.47	-4,885.39	858.79	5,253.21	5,200.95	52.25	100.539			
9,400.00	9,385.52	9,383.59	9,373.58	33.68	19.80	169.48	-4,885.20	857.65	5,252.86	5,199.88	52.98	99.141			
9,500.00	9,485.52	9,485.84	9,475.82	34.03	20.12	169.50	-4,884.97	856.08	5,252.36	5,198.69	53.67	97.864			
9,547.85	9,533.37	9,507.00	9,496.97	34.20	20.19	169.50	-4,884.92	855.77	5,252.19	5,198.28	53.90	97.436			
9,600.00	9,585.52	9,507.00	9,496.97	34.38	20.19	169.50	-4,884.92	855.77	5,252.45	5,198.37	54.08	97.128			

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offs at Design Cotton Draw Unit - 272H - Wellbore #1 - Surveys												Offset Site Error:	0.00 usft
Survey Program: 85-VESSI_GYRO_DROP, 4319-MWD												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance							
Measured	Vertical	Measured	Vertical	Reference	Offset	Azimuth	Offset Wellbore Centre	Between	Between	Minimum	Separation	Warning	
Dep h	Depth	Depth	Depth	(usft)	(usft)	from North	+N/-S	Centres	Ellipses	Separation	Factor		
(usft)	(usft)	(usft)	(usft)			(°)	(usft)	(usft)	(usft)	(usft)			
9,700.00	9,685.52	9,554.00	9,543.96	34.74	20.33	169.51	-4,885.77	855.39	5,254.01	5,199.44	54.57	96.286	
9,800.00	9,785.52	9,554.00	9,543.96	35.09	20.33	169.51	-4,885.77	855.39	5,256.96	5,202.07	54.89	95.779	
9,900.00	9,885.52	9,554.00	9,543.96	35.45	20.33	169.51	-4,885.77	855.39	5,261.81	5,206.62	55.19	95.332	
10,000.00	9,985.52	9,554.00	9,543.96	35.81	20.33	169.51	-4,885.77	855.39	5,268.56	5,213.05	55.49	94.942	
10,100.00	10,085.52	9,602.00	9,591.78	36.16	20.47	169.51	-4,889.74	855.85	5,276.80	5,220.84	55.96	94.296	
10,200.00	10,185.52	9,602.00	9,591.78	36.52	20.47	169.51	-4,889.74	855.85	5,286.40	5,230.16	56.24	93.995	
10,300.00	10,285.52	9,602.00	9,591.78	36.87	20.47	169.51	-4,889.74	855.85	5,297.88	5,241.37	56.51	93.747	
10,400.00	10,385.52	9,602.00	9,591.78	37.23	20.47	169.51	-4,889.74	855.85	5,311.21	5,254.44	56.77	93.552	
10,500.00	10,485.52	9,602.00	9,591.78	37.58	20.47	169.51	-4,889.74	855.85	5,326.39	5,269.37	57.02	93.407	
10,600.00	10,585.52	9,602.00	9,591.78	37.94	20.47	169.51	-4,889.74	855.85	5,343.40	5,286.14	57.26	93.311	
10,700.00	10,685.52	9,649.00	9,637.98	38.29	20.60	169.51	-4,898.07	857.63	5,361.66	5,303.97	57.69	92.936	
10,800.00	10,785.52	9,649.00	9,637.98	38.65	20.60	169.51	-4,898.07	857.63	5,381.42	5,323.50	57.92	92.914	
10,900.00	10,885.52	9,649.00	9,637.98	39.00	20.60	169.51	-4,898.07	857.63	5,402.95	5,344.82	58.14	92.937	
11,000.00	10,985.52	9,649.00	9,637.98	39.36	20.60	169.51	-4,898.07	857.63	5,426.24	5,367.90	58.34	93.004	
11,090.52	11,078.05	9,649.00	9,637.98	39.69	20.60	169.51	-4,898.07	857.63	5,449.34	5,390.81	58.53	93.104	
11,100.00	11,085.52	9,649.00	9,637.98	39.71	20.60	169.51	-4,898.07	857.63	5,451.22	5,392.68	58.54	93.115	
11,150.00	11,135.43	9,649.00	9,637.98	39.87	20.60	169.50	-4,898.07	857.63	5,461.67	5,403.05	58.62	93.172	
11,200.00	11,184.89	9,673.48	9,661.66	40.02	20.66	169.48	-4,904.10	859.04	5,467.79	5,408.99	58.80	92.993	
11,250.00	11,233.55	9,697.00	9,684.16	40.16	20.72	169.46	-4,910.76	860.59	5,470.70	5,411.73	58.97	92.776	
11,300.00	11,281.02	9,697.00	9,684.16	40.29	20.72	169.43	-4,910.76	860.59	5,469.27	5,410.25	59.02	92.663	
11,350.00	11,326.95	9,697.00	9,684.16	40.41	20.72	169.39	-4,910.76	860.59	5,464.01	5,404.94	59.07	92.502	
11,400.00	11,370.98	9,697.00	9,684.16	40.53	20.72	169.34	-4,910.76	860.59	5,454.95	5,395.85	59.11	92.292	
11,450.00	11,412.78	9,697.00	9,684.16	40.63	20.72	169.28	-4,910.76	860.59	5,442.15	5,383.02	59.13	92.036	
11,500.00	11,452.03	9,697.00	9,684.16	40.73	20.72	169.22	-4,910.76	860.59	5,425.66	5,366.52	59.14	91.736	
11,550.00	11,488.44	9,697.00	9,684.16	40.82	20.72	169.15	-4,910.76	860.59	5,405.59	5,346.44	59.15	91.391	
11,600.00	11,521.73	9,697.00	9,684.16	40.91	20.72	169.07	-4,910.76	860.59	5,382.05	5,322.91	59.14	91.005	
11,650.00	11,551.84	9,697.00	9,684.16	40.99	20.72	168.98	-4,910.76	860.59	5,355.17	5,296.04	59.12	90.576	
11,700.00	11,577.94	9,697.00	9,684.16	41.08	20.72	168.89	-4,910.76	860.59	5,325.10	5,266.01	59.10	90.108	
11,750.00	11,600.44	9,721.07	9,706.88	41.17	20.77	168.79	-4,918.49	862.41	5,291.44	5,232.27	59.18	89.416	
11,800.00	11,618.96	9,744.00	9,728.17	41.27	20.83	168.68	-4,926.76	864.40	5,255.81	5,196.56	59.25	88.707	
11,850.00	11,633.37	9,744.00	9,728.17	41.37	20.83	168.57	-4,926.76	864.40	5,217.08	5,157.87	59.21	88.117	
11,900.00	11,643.55	9,744.00	9,728.17	41.48	20.83	168.45	-4,926.76	864.40	5,176.02	5,116.86	59.16	87.491	
11,950.00	11,649.43	9,744.00	9,728.17	41.58	20.83	168.33	-4,926.76	864.40	5,132.90	5,073.78	59.11	86.831	
11,988.78	11,650.99	9,744.00	9,728.17	41.67	20.83	168.24	-4,926.76	864.40	5,098.21	5,039.13	59.08	86.295	
12,000.00	11,651.07	9,744.00	9,728.17	41.69	20.83	168.21	-4,926.76	864.40	5,088.04	5,028.97	59.07	86.136	
12,100.00	11,651.72	9,744.00	9,728.17	41.96	20.83	167.96	-4,926.76	864.40	4,997.55	4,938.57	58.97	84.743	
12,200.00	11,652.37	9,744.00	9,728.17	42.28	20.83	167.69	-4,926.76	864.40	4,907.43	4,848.55	58.88	83.349	
12,300.00	11,653.02	9,744.00	9,728.17	42.67	20.83	167.42	-4,926.76	864.40	4,817.69	4,758.91	58.79	81.954	
12,400.00	11,653.68	9,744.00	9,728.17	43.12	20.83	167.13	-4,926.76	864.40	4,728.37	4,669.68	58.70	80.557	
12,500.00	11,654.33	9,744.00	9,728.17	43.62	20.83	166.83	-4,926.76	864.40	4,639.49	4,580.88	58.61	79.159	
12,600.00	11,654.98	9,744.00	9,728.17	44.19	20.83	166.51	-4,926.76	864.40	4,551.07	4,492.54	58.53	77.759	
12,700.00	11,655.64	9,766.58	9,748.81	44.80	20.88	166.18	-4,935.70	866.32	4,462.73	4,404.15	58.57	76.191	
12,800.00	11,656.29	9,792.00	9,771.69	45.47	20.94	165.85	-4,946.64	868.13	4,375.37	4,316.73	58.64	74.610	
12,900.00	11,656.94	9,792.00	9,771.69	46.19	20.94	165.49	-4,946.64	868.13	4,288.03	4,229.45	58.58	73.197	
13,000.00	11,657.59	9,792.00	9,771.69	46.95	20.94	165.11	-4,946.64	868.13	4,201.25	4,142.72	58.53	71.782	
13,100.00	11,658.25	9,792.00	9,771.69	47.76	20.94	164.71	-4,946.64	868.13	4,115.07	4,056.59	58.48	70.364	
13,200.00	11,658.90	9,792.00	9,771.69	48.62	20.94	164.29	-4,946.64	868.13	4,029.53	3,971.09	58.45	68.944	
13,300.00	11,659.55	9,792.00	9,771.69	49.51	20.94	163.84	-4,946.64	868.13	3,944.67	3,886.25	58.42	67.521	
13,400.00	11,660.20	9,792.00	9,771.69	50.44	20.94	163.37	-4,946.64	868.13	3,860.54	3,802.13	58.41	66.096	
13,500.00	11,660.86	9,814.40	9,791.43	51.41	20.99	162.91	-4,957.15	869.37	3,776.64	3,718.10	58.54	64.512	
13,600.00	11,661.51	9,839.00	9,812.51	52.41	21.04	162.43	-4,969.80	870.30	3,694.13	3,635.42	58.70	62.927	
13,700.00	11,662.16	9,839.00	9,812.51	53.45	21.04	161.88	-4,969.80	870.30	3,611.81	3,553.07	58.74	61.485	

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



MS Energy Services Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offset Design Cotton Draw Unit - 272H - Wellbore #1 - Surveys														Offset Site Error:	0.00 usft
Survey Program: 85-VESSEI_GYRO_DROP_4319-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Azimuth from North (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
13,800.00	11,662.82	9,839.00	9,812.51	54.52	21.04	161.29	-4,969.80	870.30	3,530.41	3,471.61	58.80	60.040			
13,900.00	11,663.47	9,839.00	9,812.51	55.61	21.04	160.66	-4,969.80	870.30	3,449.99	3,391.11	58.88	58.591			
14,000.00	11,664.12	9,839.00	9,812.51	56.73	21.04	160.00	-4,969.80	870.30	3,370.62	3,311.63	58.99	57.141			
14,100.00	11,664.77	9,839.00	9,812.51	57.88	21.04	159.28	-4,969.80	870.30	3,292.37	3,233.25	59.12	55.687			
14,200.00	11,665.43	9,864.53	9,833.65	59.05	21.09	158.62	-4,984.09	870.82	3,214.62	3,155.18	59.44	54.086			
14,300.00	11,666.08	9,886.00	9,850.80	60.25	21.14	157.91	-4,997.00	870.96	3,138.50	3,078.74	59.76	52.522			
14,400.00	11,666.73	9,886.00	9,850.80	61.46	21.14	157.05	-4,997.00	870.96	3,063.22	3,003.22	59.99	51.059			
14,500.00	11,667.39	9,886.00	9,850.80	62.70	21.14	156.12	-4,997.00	870.96	2,989.39	2,929.12	60.27	49.598			
14,600.00	11,668.04	9,886.00	9,850.80	63.95	21.14	155.12	-4,997.00	870.96	2,917.12	2,856.52	60.60	48.140			
14,700.00	11,668.69	9,911.71	9,870.53	65.23	21.19	154.22	-5,013.48	870.79	2,845.80	2,784.70	61.10	46.576			
14,800.00	11,669.34	9,933.00	9,886.15	66.52	21.23	153.24	-5,027.93	870.41	2,776.39	2,714.76	61.63	45.052			
14,900.00	11,670.00	9,933.00	9,886.15	67.82	21.23	151.99	-5,027.93	870.41	2,708.37	2,646.26	62.11	43.609			
15,000.00	11,670.65	9,951.48	9,899.22	69.14	21.27	150.83	-5,040.99	869.81	2,642.11	2,579.39	62.72	42.124			
15,100.00	11,671.30	9,981.00	9,919.19	70.48	21.33	149.74	-5,062.65	868.09	2,577.65	2,514.22	63.43	40.639			
15,200.00	11,671.95	9,981.00	9,919.19	71.83	21.33	148.17	-5,062.65	868.09	2,514.80	2,450.70	64.09	39.238			
15,300.00	11,672.61	10,002.18	9,932.78	73.19	21.38	146.78	-5,078.81	866.43	2,453.96	2,389.08	64.88	37.823			
15,400.00	11,673.26	10,028.00	9,948.41	74.56	21.44	145.38	-5,099.23	864.11	2,395.36	2,329.63	65.73	36.440			
15,500.00	11,673.91	10,028.00	9,948.41	75.94	21.44	143.37	-5,099.23	864.11	2,338.87	2,272.27	66.60	35.116			
15,600.00	11,674.57	10,050.16	9,960.93	77.34	21.49	141.63	-5,117.37	861.91	2,284.80	2,217.23	67.57	33.814			
15,700.00	11,675.22	10,075.00	9,973.89	78.74	21.55	139.82	-5,138.40	859.29	2,233.44	2,164.85	68.59	32.561			
15,800.00	11,675.87	10,075.00	9,973.89	80.16	21.55	137.20	-5,138.40	859.29	2,184.71	2,115.05	69.67	31.360			
15,900.00	11,676.52	10,101.88	9,986.76	81.58	21.62	135.09	-5,161.84	856.57	2,138.74	2,067.94	70.80	30.207			
16,000.00	11,677.18	10,123.00	9,996.13	83.01	21.67	132.62	-5,180.68	854.72	2,095.84	2,023.85	71.99	29.112			
16,100.00	11,677.83	10,123.00	9,996.13	84.46	21.67	129.20	-5,180.68	854.72	2,056.40	1,983.16	73.24	28.078			
16,200.00	11,678.48	10,149.72	10,006.67	85.90	21.75	126.43	-5,205.14	852.73	2,020.01	1,945.50	74.52	27.108			
16,300.00	11,679.13	10,171.00	10,013.78	87.36	21.81	123.23	-5,225.15	851.43	1,987.62	1,911.80	75.82	26.214			
16,400.00	11,679.79	10,171.00	10,013.78	88.82	21.81	118.82	-5,225.15	851.43	1,959.07	1,881.89	77.17	25.386			
16,500.00	11,680.44	10,199.90	10,021.58	90.29	21.90	115.42	-5,252.92	849.69	1,934.14	1,855.65	78.49	24.641			
16,600.00	11,681.09	10,218.00	10,025.35	91.77	21.96	111.26	-5,270.58	848.45	1,913.32	1,833.51	79.81	23.972			
16,700.00	11,681.75	10,237.45	10,028.49	93.25	22.03	106.93	-5,289.72	847.13	1,896.58	1,815.47	81.11	23.382			
16,800.00	11,682.40	10,266.00	10,031.53	94.74	22.13	102.91	-5,318.06	845.50	1,884.14	1,801.77	82.37	22.875			
16,900.00	11,683.05	10,280.83	10,032.50	96.23	22.18	97.93	-5,332.84	844.84	1,875.62	1,792.01	83.61	22.433			
17,000.00	11,683.70	10,334.10	10,034.77	97.73	22.40	95.15	-5,386.03	842.99	1,870.58	1,785.80	84.78	22.063			
17,100.00	11,684.36	10,402.20	10,036.08	99.23	22.71	93.23	-5,454.07	840.43	1,867.55	1,781.62	85.92	21.735			
17,200.00	11,685.01	10,490.70	10,036.27	100.74	23.19	92.53	-5,542.48	836.44	1,865.64	1,778.59	87.05	21.432			
17,300.00	11,685.66	10,598.35	10,036.34	102.25	23.88	93.01	-5,650.00	831.13	1,863.66	1,775.46	88.20	21.130			
17,400.00	11,686.32	10,703.73	10,035.58	103.77	24.66	93.35	-5,755.17	824.57	1,861.76	1,772.40	89.36	20.835			
17,500.00	11,686.97	10,838.31	10,036.56	105.29	25.79	95.51	-5,889.43	815.41	1,858.25	1,767.69	90.56	20.519			
17,600.00	11,687.62	10,956.49	10,039.96	106.81	26.89	96.67	-6,007.37	808.80	1,853.56	1,761.67	91.89	20.170			
17,700.00	11,688.27	11,040.49	10,042.95	108.34	27.74	95.69	-6,091.23	805.07	1,848.84	1,755.55	93.28	19.819			
17,800.00	11,688.93	11,107.04	10,045.22	109.88	28.44	93.59	-6,157.73	803.61	1,845.38	1,750.67	94.71	19.485			
17,900.00	11,689.58	11,174.94	10,046.80	111.41	29.18	91.56	-6,225.60	803.46	1,843.79	1,747.63	96.16	19.174			
17,951.17	11,689.91	11,211.96	10,047.33	112.20	29.59	90.66	-6,262.63	803.69	1,843.80	1,746.68	96.92	19.022			
18,000.00	11,690.23	11,249.81	10,047.65	112.95	30.02	89.97	-6,300.47	804.10	1,843.77	1,746.11	97.66	18.880			
18,100.00	11,690.88	11,342.99	10,047.72	114.49	31.10	89.54	-6,393.64	804.57	1,844.52	1,745.30	99.23	18.589			
18,200.00	11,691.54	11,426.96	10,047.58	116.04	32.11	88.52	-6,477.60	805.75	1,845.92	1,745.12	100.80	18.313			
18,300.00	11,692.19	11,551.62	10,049.00	117.59	33.66	90.08	-6,602.21	809.14	1,846.78	1,744.08	102.70	17.983			
18,400.00	11,692.84	11,640.90	10,050.13	119.14	34.81	89.40	-6,691.44	811.62	1,847.62	1,743.19	104.42	17.694			
18,500.00	11,693.50	11,733.73	10,050.75	120.70	36.02	88.95	-6,784.24	813.91	1,848.82	1,742.65	106.18	17.413			
18,600.00	11,694.15	11,831.52	10,051.08	122.25	37.33	88.82	-6,881.98	817.14	1,850.72	1,742.72	108.01	17.135			
18,690.65	11,694.74	11,951.67	10,053.07	123.67	38.97	90.65	-7,002.08	819.64	1,850.69	1,740.80	109.89	16.841			
18,700.00	11,694.80	11,959.23	10,053.18	123.81	39.07	90.54	-7,009.65	819.76	1,850.69	1,740.64	110.05	16.817			

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



MS Energy Services
Anticollision Report



Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Offs at Design Cotton Draw Unit - 272H - Wellbore #1 - Surveys													Offset Site Error: 0.00 usft
Survey / Program: 85-VESSI_GYRO_DROP, 4319-MWD													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
18,800.00	11,695.45	12,095.86	10,055.63	125.37	40.97	92.81	-7,146.24	821.46	1,850.52	1,738.39	112.13	16.503	
18,900.00	11,696.11	12,181.13	10,058.02	126.94	42.18	91.89	-7,231.47	822.20	1,849.08	1,735.13	113.94	16.228	
19,000.00	11,696.76	12,314.94	10,062.45	128.51	44.10	93.98	-7,365.20	821.87	1,846.51	1,730.49	116.02	15.915	
19,100.00	11,697.41	12,399.18	10,064.83	130.08	45.32	93.01	-7,449.40	821.39	1,844.29	1,726.47	117.82	15.653	
19,200.00	11,698.07	12,525.67	10,067.49	131.65	47.16	94.66	-7,575.77	816.72	1,841.11	1,721.42	119.68	15.383	
19,300.00	11,698.72	12,620.44	10,069.57	133.22	48.55	94.35	-7,670.44	812.80	1,837.70	1,716.29	121.42	15.136	
19,400.00	11,699.37	12,709.92	10,070.82	134.80	49.87	93.70	-7,759.82	808.64	1,834.74	1,711.65	123.10	14.905	
19,500.00	11,700.02	12,799.71	10,072.11	136.37	51.21	93.07	-7,849.55	805.65	1,832.41	1,707.59	124.83	14.679	
19,600.00	11,700.68	12,896.36	10,073.04	137.95	52.66	92.86	-7,946.14	802.41	1,830.48	1,703.90	126.58	14.461	
19,700.00	11,701.33	12,995.88	10,074.78	139.53	54.16	92.84	-8,045.62	800.44	1,828.56	1,700.12	128.43	14.237	
19,800.00	11,701.98	13,103.49	10,077.25	141.11	55.79	93.32	-8,153.19	799.30	1,826.62	1,696.22	130.39	14.008	
19,900.00	11,702.63	13,208.62	10,081.15	142.70	57.40	93.64	-8,258.25	799.58	1,824.08	1,691.63	132.45	13.772	
20,000.00	11,703.29	13,287.02	10,083.45	144.28	58.61	92.27	-8,336.62	799.29	1,821.95	1,687.65	134.30	13.566	
20,100.00	11,703.94	13,363.94	10,084.45	145.87	59.79	90.80	-8,413.52	799.15	1,821.28	1,685.18	136.11	13.381	
20,114.34	11,704.03	13,376.01	10,084.49	146.10	59.98	90.66	-8,425.60	799.08	1,821.27	1,684.91	136.37	13.356	
20,200.00	11,704.59	13,446.89	10,084.18	147.46	61.07	89.72	-8,496.47	798.25	1,821.60	1,683.73	137.87	13.212	
20,300.00	11,705.25	13,548.35	10,082.52	149.05	62.64	89.81	-8,597.91	796.81	1,822.90	1,683.19	139.70	13.048	
20,400.00	11,705.90	13,678.08	10,081.60	150.64	64.64	91.71	-8,727.52	791.57	1,821.89	1,680.32	141.57	12.870	
20,500.00	11,706.55	13,792.08	10,080.97	152.24	66.41	92.61	-8,841.42	786.74	1,820.89	1,677.56	143.34	12.704	
20,600.00	11,707.20	13,877.79	10,081.54	153.83	67.75	91.69	-8,927.09	784.34	1,819.53	1,674.44	145.09	12.541	
20,700.00	11,707.86	13,964.58	10,081.36	155.43	69.10	90.84	-9,013.85	782.16	1,819.06	1,672.23	146.83	12.389	
20,800.00	11,708.51	14,104.52	10,080.99	157.02	71.29	93.44	-9,153.68	776.96	1,818.16	1,669.42	148.74	12.223	
20,900.00	11,709.16	14,208.89	10,082.52	158.62	72.93	93.73	-9,257.95	772.64	1,815.44	1,664.91	150.53	12.060	
21,000.00	11,709.82	14,287.45	10,082.75	160.22	74.16	92.34	-9,336.43	769.01	1,813.52	1,661.35	152.17	11.918	
21,100.00	11,710.47	14,396.09	10,082.47	161.82	75.87	92.91	-9,444.96	764.08	1,812.15	1,658.26	153.89	11.775	
21,200.00	11,711.12	14,540.29	10,084.56	163.42	78.14	95.86	-9,588.92	756.13	1,808.71	1,653.03	155.68	11.618	
21,300.00	11,711.77	14,644.63	10,088.05	165.03	79.79	96.17	-9,693.10	751.44	1,804.21	1,646.72	157.49	11.456	
21,400.00	11,712.43	14,726.85	10,090.98	166.63	81.10	95.00	-9,775.22	748.72	1,800.10	1,640.80	159.30	11.300	
21,500.00	11,713.08	14,820.31	10,093.78	168.23	82.59	94.57	-9,868.60	746.40	1,796.85	1,635.67	161.18	11.148	
21,600.00	11,713.73	14,872.00	10,095.31	169.84	83.41	91.31	-9,920.25	745.14	1,794.31	1,631.48	162.83	11.020	
21,609.04	11,713.79	14,872.00	10,095.31	169.99	83.41	90.70	-9,920.25	745.14	1,794.28	1,631.34	162.94	11.012 CC, ES	
21,656.46	11,714.10	14,872.00	10,095.31	170.75	83.41	87.49	-9,920.25	745.14	1,794.91	1,631.43	163.48	10.979 SF	

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



MS Energy Services Anticollision Report



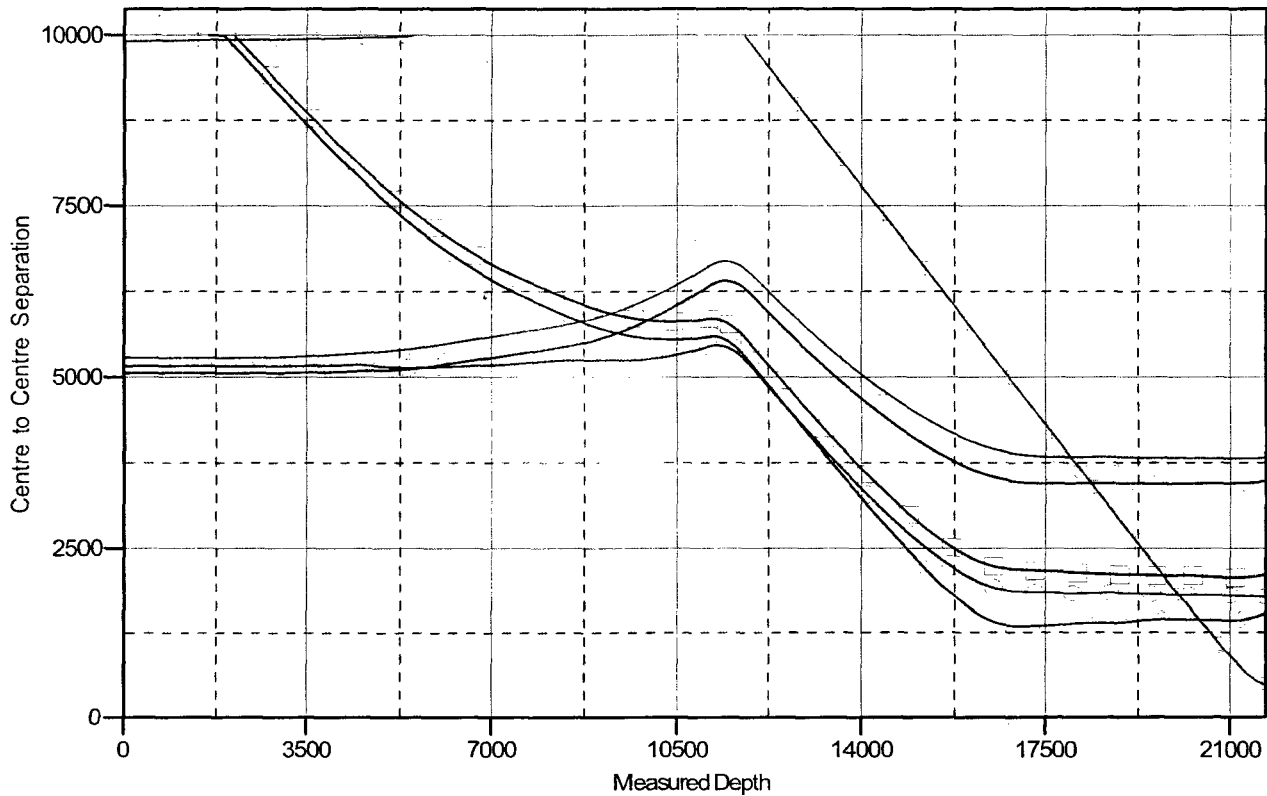
Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

Local Co-ordinate Reference: Well 518H
TVD Reference: Well @ 3514.10usft (Cactus 126)
MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Reference Depths are relative to Well @ 3514.10usft (Cactus 126)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 518H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.30°

Ladder Plot



LEGEND

153H, Wellbore #1, Surveys V0
154H, Wellbore #1, Surveys V0
216Y, Wellbore #1, Surveys V0
217H, Wellbore #1, Surveys V0
272H, Wellbore #1, Surveys V0
#89, Wellbore #1, Surveys V0
#89, Wellbore #2, Surveys V0



MS Energy Services

Anticollision Report



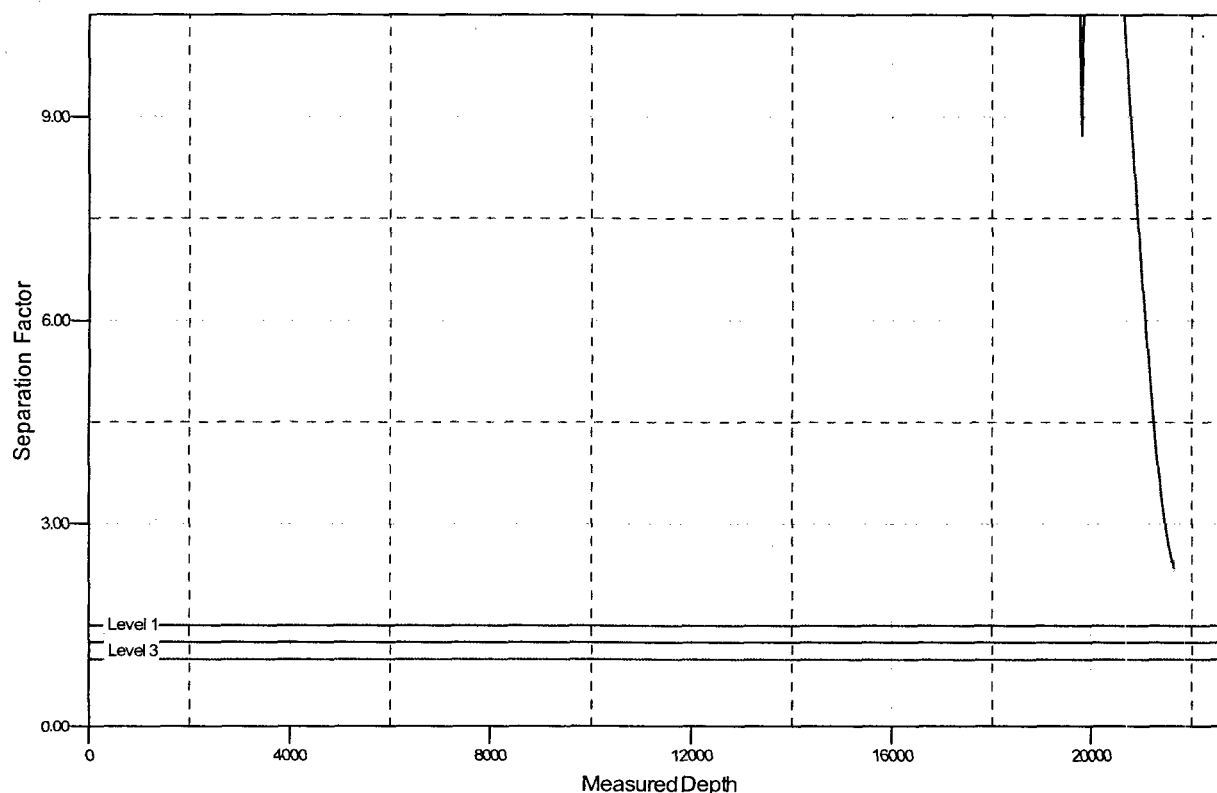
Company: Devon Energy
Project: Eddy County, New Mexico (NAD 83)
Reference Site: Cotton Draw Unit
Site Error: 0.00 usft
Reference Well: 518H
Well Error: 0.00 usft
Reference Wellbore: Wellbore #1
Reference Design: Design #1

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MD Reference: Well @ 3514.10usft (Cactus 126)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.14 Conroe Server
Offset TVD Reference: Offset Datum

Reference Depths are relative to Well @ 3514.10usft (Cactus 126)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: 518H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.30°

Separation Factor Plot



LEGEND

153H, Wellbore #1, Surveys V0
154H, Wellbore #1, Surveys V0
216Y, Wellbore #1, Surveys V0
217H, Wellbore #1, Surveys V0
272H, Wellbore #1, Surveys V0
#89, Wellbore #1, Surveys V0
#89, Wellbore #2, Surveys V0

Devon Energy Prod. Co., L.P./Cotton Draw Unit 518H

1. Geologic Formations

TVD of target	11714	Pilot hole depth	
MD at TD:	21656	Deepest expected fresh water:	400

Basin

[illegible]

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

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
	From	To							
17.5"	0	725'	13.375"	48	H-40	STC	1.74	2.45	4.13
12.25"	0	4,350'	9.625"	40	J-55	LTC	1.19	1.42	3.98
8.75"	0	21,656'	5.5"	17	P110	BTC	2.18	2.7	3.21
				BLM Minimum Safety Factor			1.125	1	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

Is casing new? If used, attach certification as required in Onshore Order #1	Y or N Y
--	-------------

Devon Energy Prod. Co., L.P./Cotton Draw Unit 518H

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 Prod. Co., L.P./Cotton Draw Unit 518H

3. Cementing Program

Casing	# Sks	Wt. lb/ gal	H ₂ O gal/sk	Yld ft ³ / sack	500# Comp. Strength (hours)	Slurry Description
13-3/8" Surface	755	14.8	6.34	1.34	6	Tail: Class C Cement + 1% Calcium Chloride
9-5/8" Inter.	737	12.9	9.81	1.85	14	Lead: (65:35) Class C Cement: Poz (Fly Ash): 6% BWOC Bentonite + 5% BWOW Sodium Chloride + 0.125 lbs/sack Poly-E-Flake
	306	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
5-1/2" Prod	715	9	13.5	3.27	21	Lead: Tuned Light® Cement
	3190	14.5	5.31	1.2	25	Tail: (50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite

Casing String	TOC	% Excess
13-3/8" Surface	0'	50%
9-5/8" Intermediate	0'	30%
5-1/2" Production Casing	4150'	25%

Devon Energy Prod. Co., L.P./Cotton Draw Unit 518H

4. Pressure Control Equipment

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

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12-1/4"	13-5/8"	5M	Annular	X	50% of working pressure
			Blind Ram		5M
			Pipe Ram		
			Double Ram	X	
			Other*		
8-3/4"	13-5/8"	5M	Annular	X	50% testing pressure
			Blind Ram		5M
			Pipe Ram		
			Double Ram	X	
			Other *		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other *		

*Specify if additional ram is utilized.

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

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

X	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
---	---

Devon Energy Prod. Co., L.P./Cotton Draw Unit 518H

	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.	
Y /N	Are anchors required by manufacturer?	
	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. • Provide description here See attached schematic.	

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	725	FW Gel	8.6-8.8	28-34	N/C
725	4350	Saturated Brine	10.0-10.2	28-34	N/C
4350	21656	Cut Brine	8.5-9.3	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	Int. shoe to KOP
Density	Int. shoe to KOP
X CBL	Production casing
X Mud log	Intermediate shoe to TD
PEX	

Devon Energy Prod. Co., L.P./Cotton Draw Unit 518H

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	5857 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.	
x	H2S is present
x	H2S Plan attached

8. Other facets of operation

Is this a walking operation? If yes, describe.

Will be pre-setting casing? If yes, describe.

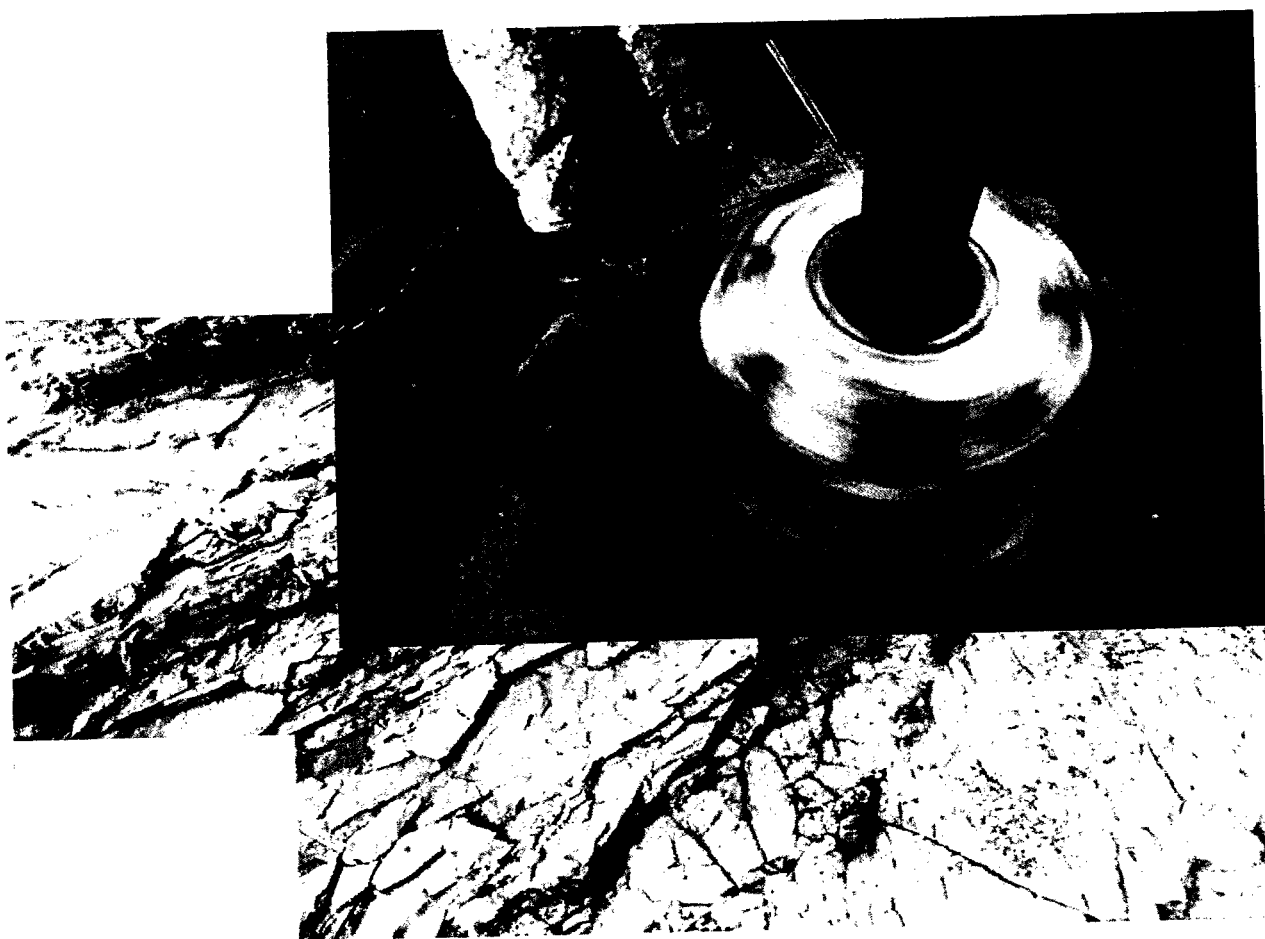
Attachments

☒ 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.

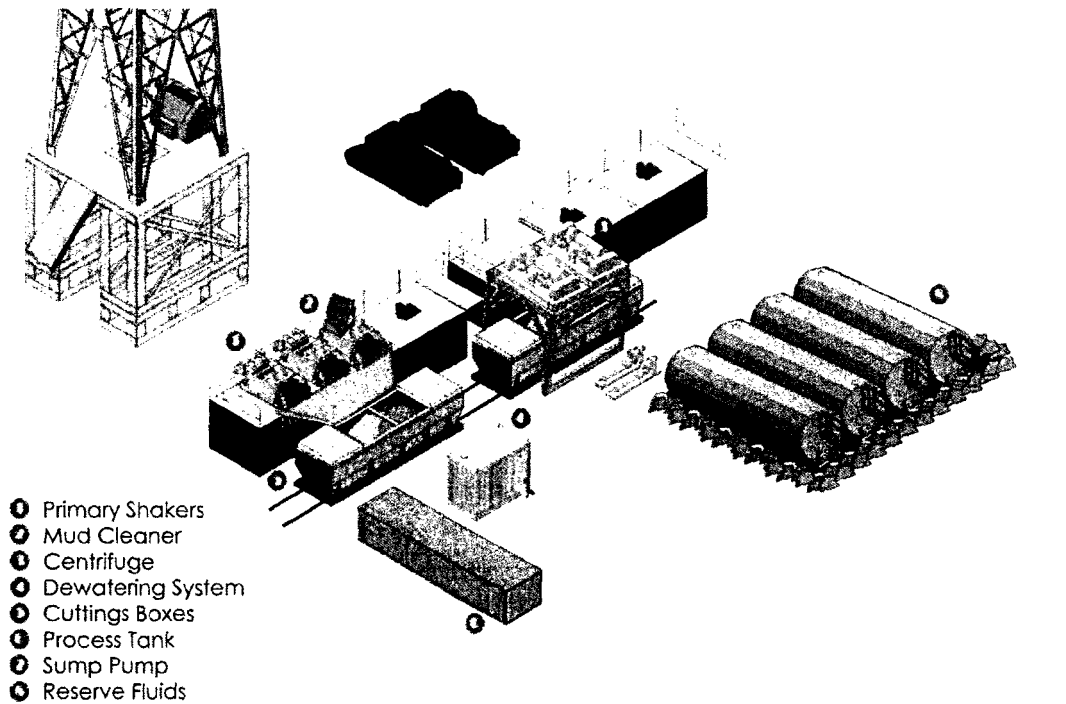
II. Operations and Maintenance Plan

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



Mi SWACO

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 3000 (3M) psi.

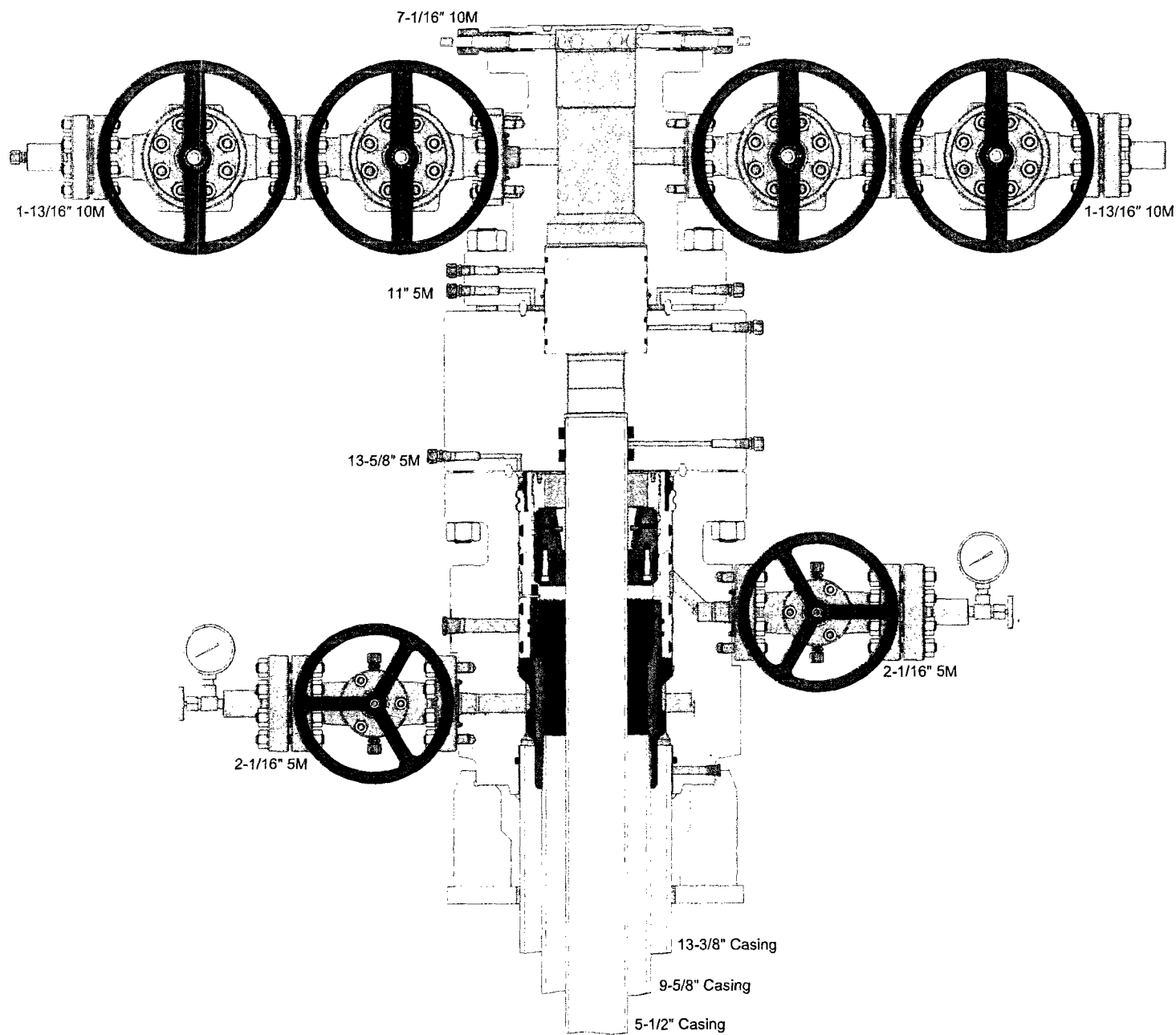
- Wellhead will be installed by wellhead representatives.
- If the welding is performed by a third party, the wellhead representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
- Wellhead representative will install the test plug for the initial 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 3M, 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 3M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 3,000 psi high pressure test. The 3,000 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 3M 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 3,000 psi WP.

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





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.

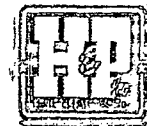
Should you have any questions or require any additional information/clarifications then please do not hesitate to contact us.

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.**

 5728 Szeged, Budapest út 10. Hungary • H-6701 Szeged, P. O. Box 152
 Phone: (3662) 556-737 • Fax: (3662) 556-738

 SALES & MARKETING: H-1092 Budapest, Ráday u. 42-44. Hungary • H-1440 Budapest, P. O. Box 26
 Phone: (361) 456-4200 • Fax: (361) 217-2972, 456-4273 • www.taurusermerge.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 Testing PHOENIX RUBBER Q.C.		

40920-0-00015 N8006

8	GNL	+0.000	PC	14:00		
	RDL	+0.000	PC	14:00		
	DL	+0.000	PC	14:00		
7	GNL	+0.000	PC	13:40	40	60
	RDL	+0.000	PC	13:40		
	DL	+0.000	PC	13:40		
6	GNL	+0.000	PC	13:20		
	RDL	+0.000	PC	13:20		
	DL	+0.000	PC	13:20		
5	GNL	+0.000	PC	13:00		
	RDL	+0.000	PC	13:00		
	DL	+0.000	PC	13:00		
4	GNL	+0.000	PC	12:40		
	RDL	+0.000	PC	12:40		
	DL	+0.000	PC	12:40		
3	GNL	+0.000	PC	12:20		
	RDL	+0.000	PC	12:20		
	DL	+0.000	PC	12:20		
2	GNL	+0.000	PC	12:00		
	RDL	+0.000	PC	12:00		
	DL	+0.000	PC	12:00		

PRINCEX RUBBER
Industrial Ltd.
Hose Inspection and
Certification Dept.

VERIFIED TRUE CO.
PHOENIX RUBBER CO.

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.



U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

SUPO Data Report

01/25/2018

APD ID: 10400017586

Submission Date: 09/07/2017

Highlighted data
reflects the most
recent changes

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

CDU_518H_Ex_Access_Rd_20170829100226.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT

Row(s) Exist? NO

ROW ID(s)

ID:

Do the existing roads need to be improved? YES

Existing Road Improvement Description: Improve road to accommodate Drilling and Completion operations.

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

CDU_518H_Access_Rd_20170829100332.pdf

New road type: COLLECTOR,RESOURCE

Length: 5221

Feet

Width (ft.): 30

Max slope (%): 6

Max grade (%): 4

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 30

New road access erosion control: Water drainage ditch.

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

Access surfacing type: GRAVEL

Access topsoil source: ONSITE

Access surfacing type description:

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: See attached interim reclamation diagram.

Access other construction information:

Access miscellaneous information:

Number of access turnouts:

Access turnout map:

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: N/A

Road Drainage Control Structures (DCS) description: N/A

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

CDU_518H_1mile_Map_08-07-2017.pdf

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: All Flow lines will be buried going to the Cotton Draw Unit 26-35 CTB, located in Sec 35-T24S-R31E.

Section 5 - Location and Types of Water Supply

Water Source Table

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

Water source use type: STIMULATION

Water source type: RECYCLED

Describe type:

Source latitude:

Source longitude:

Source datum:

Water source permit type: OTHER

Source land ownership: FEDERAL

Water source transport method: PIPELINE,TRUCKING

Source transportation land ownership: FEDERAL

Water source volume (barrels): 170000

Source volume (acre-feet): 21.911827

Source volume (gal): 7140000

Water source and transportation map:

CDU_518H_Wtr_Xfr_Map_08-07-2017.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.):

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:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

Section 6 - Construction Materials

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

Construction Materials source location attachment:

CDU_518H_Caliche_Pit_20170829100608.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Water Based Cuttings

Amount of waste: 1810 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.

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

Waste type: FLOWBACK

Waste content description: Produced water during flowback operations. This amount is a daily average during flowback (BWPD).

Amount of waste: 1500 barrels

Waste disposal frequency : Daily

Safe containment description: N/A

Safe containmant attachment:

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

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

Disposal type description:

Disposal location description: One of three company owned SWD facilities in the area: CDU 181, CDU 89, CDU 84.

Waste type: PRODUCED WATER

Waste content description: Produced water during production operations. This amount is a daily average during the first year of production (BWPD).

Amount of waste: 1000 barrels

Waste disposal frequency : Daily

Safe containment description: N/A

Safe containmant attachment:

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

Disposal type description:

Disposal location description: One of three company owned SWD facilities in the area: CDU 181, CDU 89, CDU 84.

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

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

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

CDU_518H_Rig_Layout_08-07-2017.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance

Multiple Well Pad Name:

Multiple Well Pad Number:

Recontouring attachment:

CDU_518H_Reclamation_20170829100905.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.

Wellpad long term disturbance (acres): 2.677

Wellpad short term disturbance (acres): 3.376

Access road long term disturbance (acres): 0.291

Access road short term disturbance (acres): 0.291

Pipeline long term disturbance (acres): 3.59573

Pipeline short term disturbance (acres): 3.59573

Other long term disturbance (acres): 0

Other short term disturbance (acres): 0

Total long term disturbance: 6.5637302

Total short term disturbance: 7.26273

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:

Existing Vegetation at the well pad attachment:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

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:

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

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

First Name: Jacob

Last Name: Ochoa

Phone: (575)748-9934

Email: jacob.ochoa@dvni.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:

Section 11 - Surface Ownership

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:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland:

USFS Ranger District:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

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:

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:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

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:

Section 12 - Other Information

Right of Way needed? NO

Use APD as ROW?

ROW Type(s):

ROW Applications

SUPO Additional Information: Grading & Cross Section Misc. Plats Flowline Plats Electric Plats Gas Capture Plan CTB

Use a previously conducted onsite? NO

Previous Onsite information:

Other SUPO Attachment

CDU_518H_Grading___X_Sec_20170829102209.pdf

CDU_518H_Misc_Plats_20170829102239.pdf

CDU_518H_Flowline_20170829102305.pdf

CDU_518H_Electric_20170829102331.pdf

CDU_518H_GasCapturePlan_20170907140019.pdf

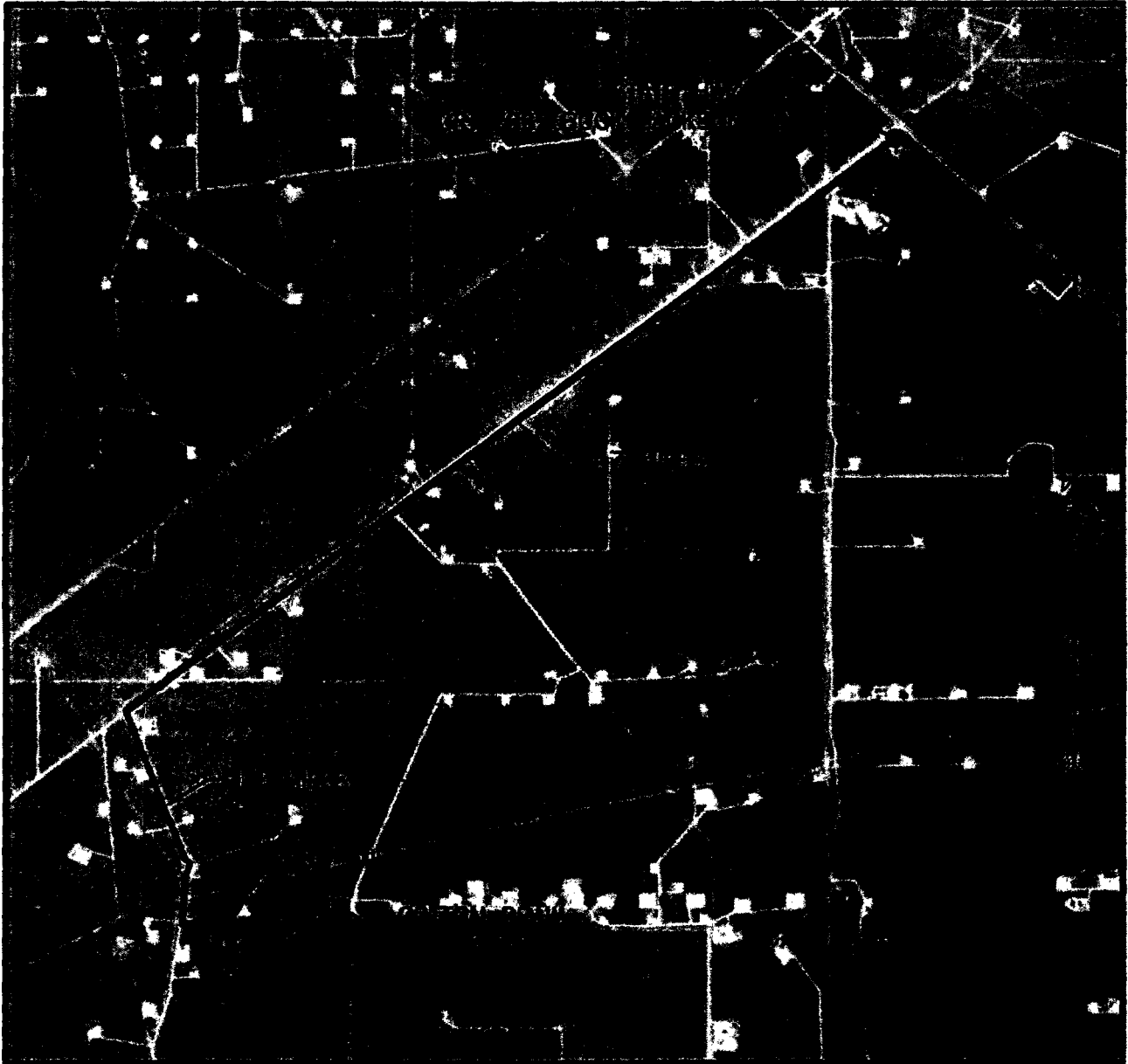
Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW UNIT

Well Number: 518H

CDU_518H_CTB_20171130043503.pdf

SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
AERIAL ACCESS ROUTE MAP



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEB. 2017

DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 518H

LOCATED 330 FT. FROM THE NORTH LINE
AND 2185 FT. FROM THE EAST LINE OF
SECTION 34, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 18, 2017

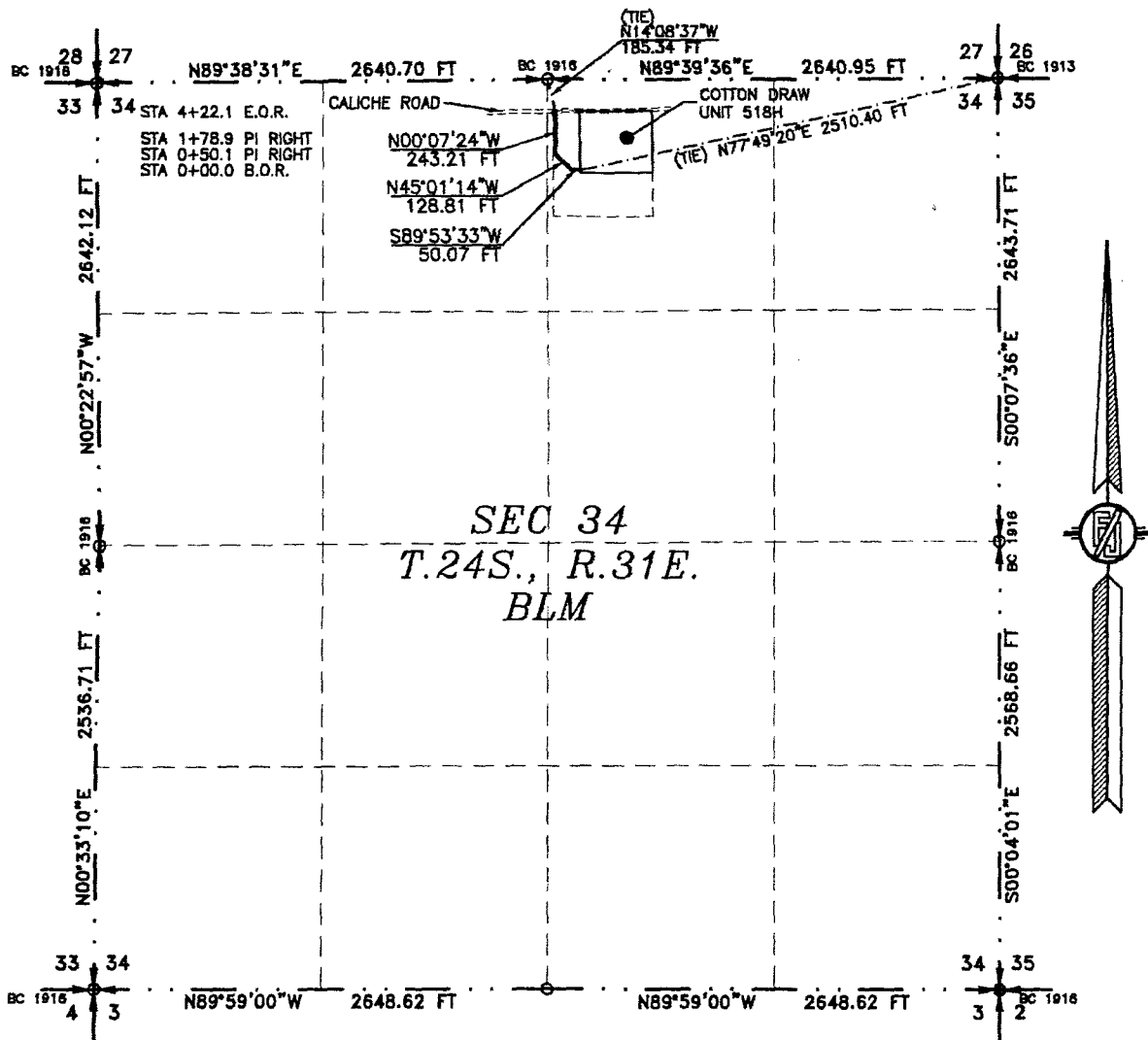
SURVEY NO. 5336A

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

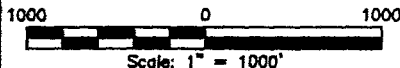
ACCESS ROAD PLAT

ACCESS ROAD FOR COTTON DRAW UNIT 518H

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 18, 2017



SEE NEXT SHEET (2-2) FOR DESCRIPTION



GENERAL NOTES

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

SHEET: 1-2

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

SURVEYOR CERTIFICATE

I, FILMON E. 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 18 DAY OF JULY 2017

FILMON E. JARAMILLO, NO. 12797

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

SURVEY NO. 5336A

ACCESS ROAD PLAT
ACCESS ROAD FOR COTTON DRAW UNIT 518H

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 18, 2017

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE NW/4 NE/4 OF SAID SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTHEAST CORNER OF SAID SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N77°49'20"E, A DISTANCE OF 2510.40 FEET;
THENCE S89°53'33"W A DISTANCE OF 50.07 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N45°01'14"W A DISTANCE OF 128.81 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N00°07'24"W A DISTANCE OF 243.21 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N14°08'37"W, A DISTANCE OF 185.34 FEET;

SAID STRIP OF LAND BEING 422.09 FEET OR 25.58 RODS IN LENGTH, CONTAINING 0.291 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NW/4 NE/4 422.09 L.F. 25.58 RODS 0.291 ACRES

GENERAL NOTES

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

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

SHEET: 2-2

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

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 18 DAY OF JULY 2017.

[Signature]
FILIMON F. JARAMILLO, P.S. 12797

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

SURVEY NO. 5336A

24S 31E

One Mile Radius Map

Estimated Distances to nearest Wellbores:

*From SHL:
 CDU 114H 215 ft E
 CDU 117H Crosses wellbore path
 *From BHL:
 CDU 89 325 ft NW

devon

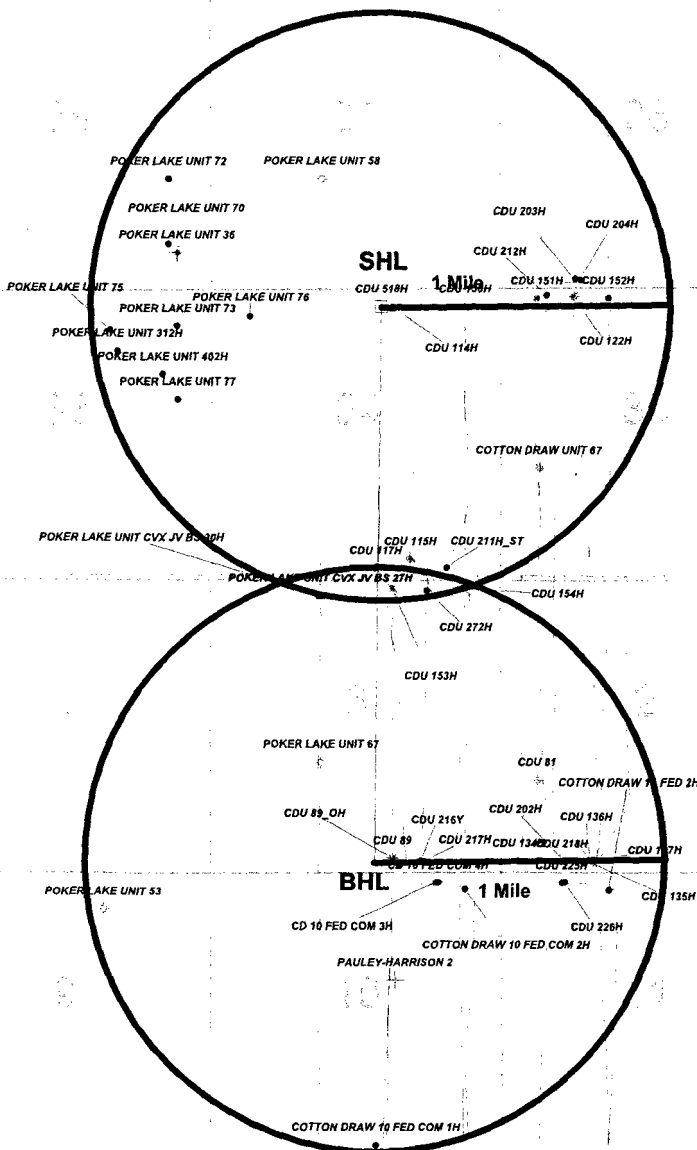
CDU 518H

1 Mile Radius Map

0 2,200 4,400
 FEET

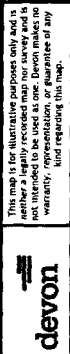
WELL SYMBOLS
 ABANDONED WATER WELL
 DRY AND ABANDONED WELL
 GAS PRODUCING WELL
 OIL PRODUCING WELL
 PLUGGED AND ABANDONED
 PROPOSED
 SHUT IN WELL
 SALT WATER DISPOSAL WELL
 TEMPORARILY ABANDONED WELL

July 26, 2017



CDU 5117 H

water delivery routes



WGS_1984_Web_Mercator_Auxiliary_Sphere
Prepared by: Stephen Richards
Map is current as of: 01-Aug-2017



- State pit 616 and 617 32- 23S- 32E



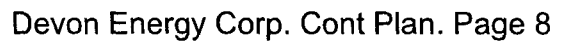
- Fed pit 25- 23S- 31E



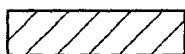
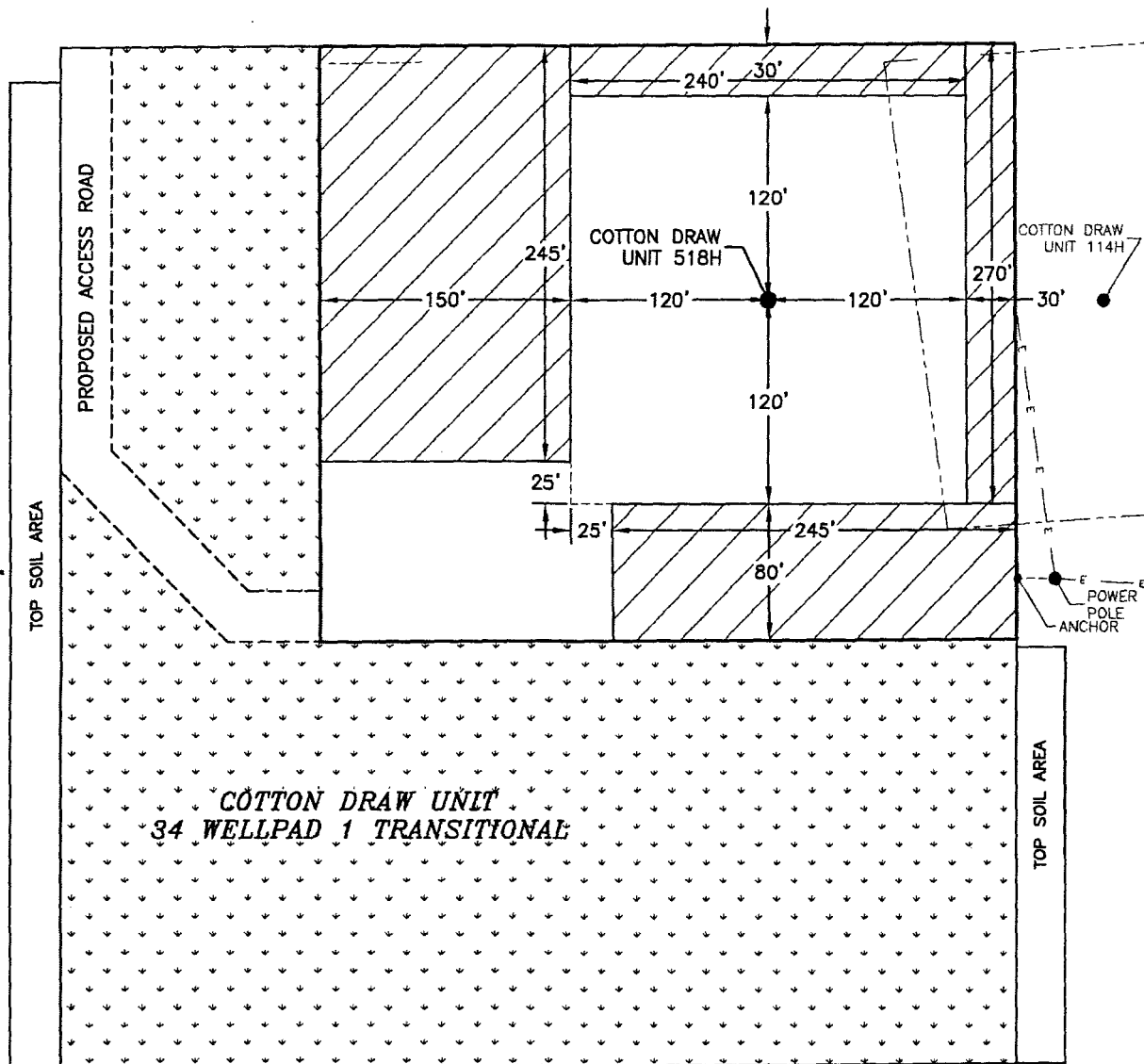
- Private pit 26- 23S- 31E



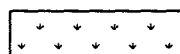
Prevailing Wind
Direction S, SW



SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
INTERIM SITE BUILD PLAN



DENOTES INTERIM PAD
RECLAMATION AREA



DENOTES GRADING SITE
RECLAMATION AREA

010 50 100 200
SCALE 1" = 100'

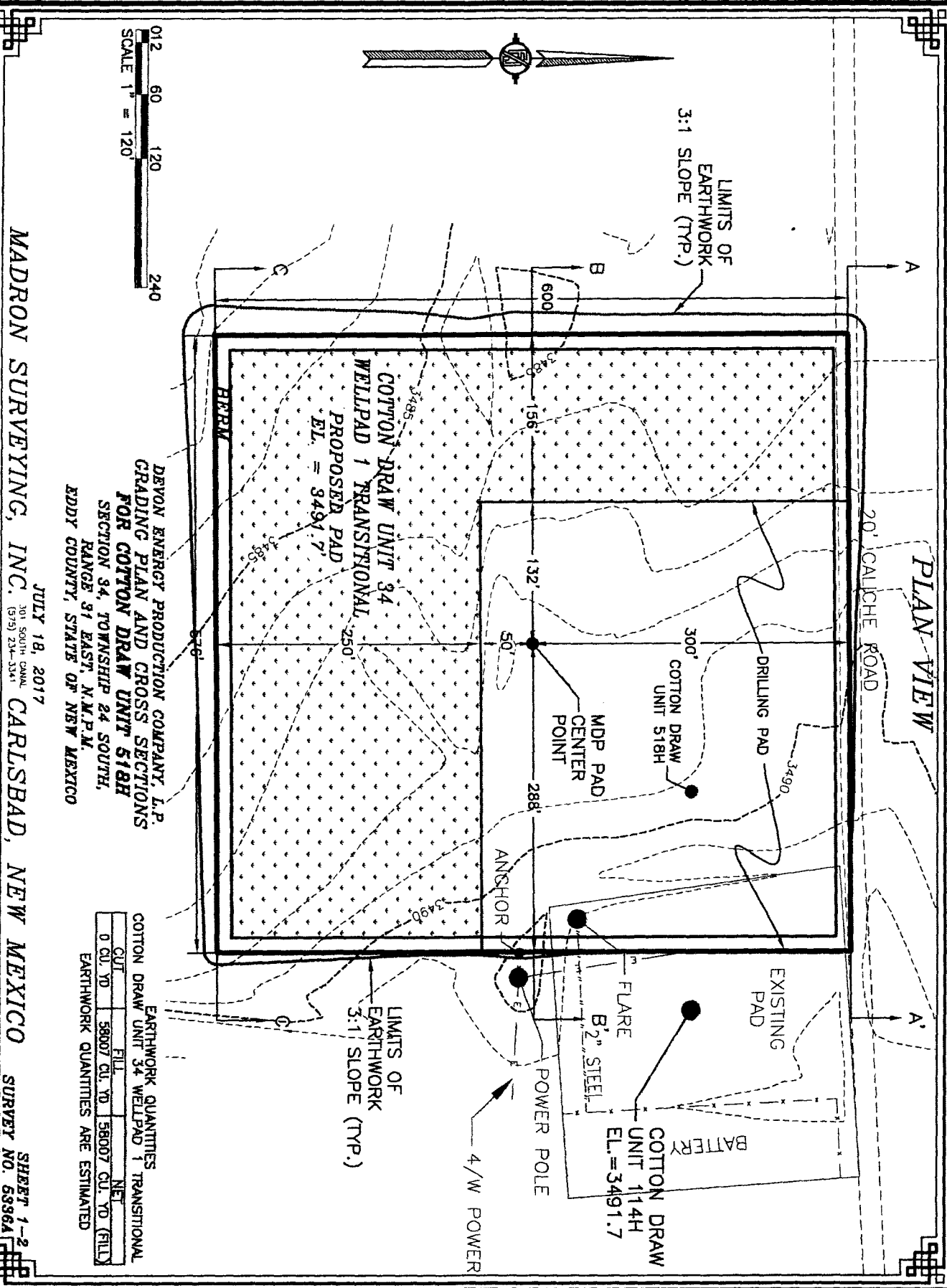
1.643± ACRES INTERIM PAD RECLAMATION AREA
4.268± ACRES GRADING SITE RECLAMATION AREA
2.023± ACRES NON-RECLAIMED AREA
7.934± ACRES COTTON DRAW UNIT 34 WELLPAD
1 TRANSITIONAL

DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 518H
LOCATED 330 FT. FROM THE NORTH LINE
AND 2185 FT. FROM THE EAST LINE OF
SECTION 34, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 18, 2017

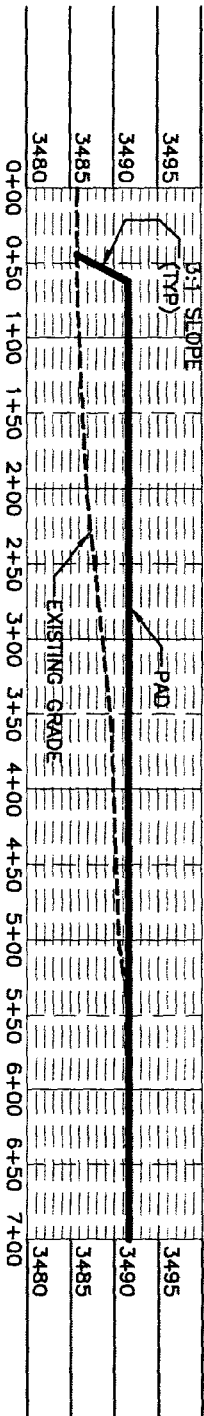
SURVEY NO. 5336A

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

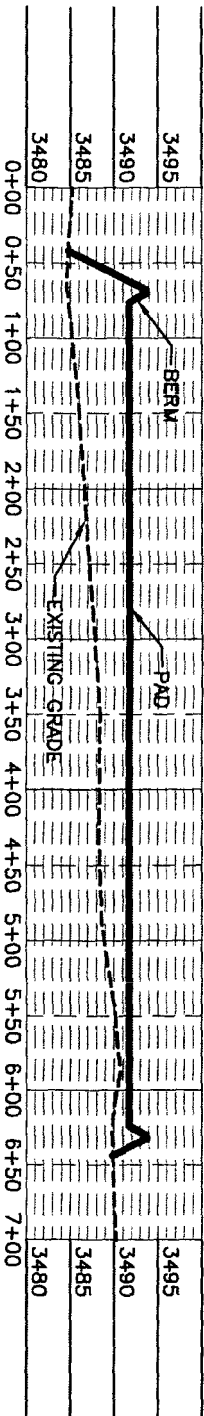


CROSS-SECTIONS

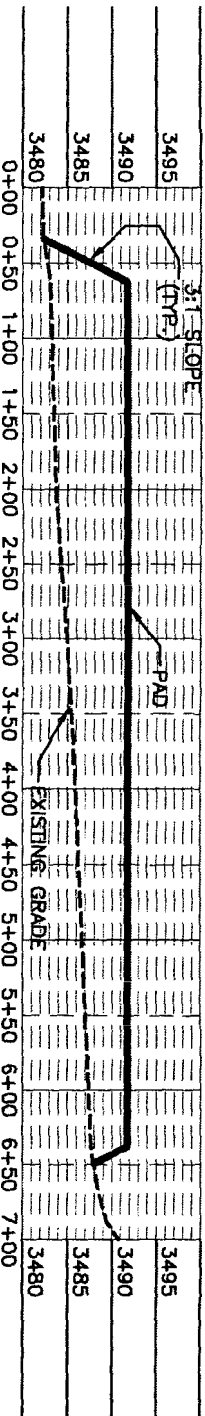
SECTION A-A'



SECTION B-B'



SECTION C-C'



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

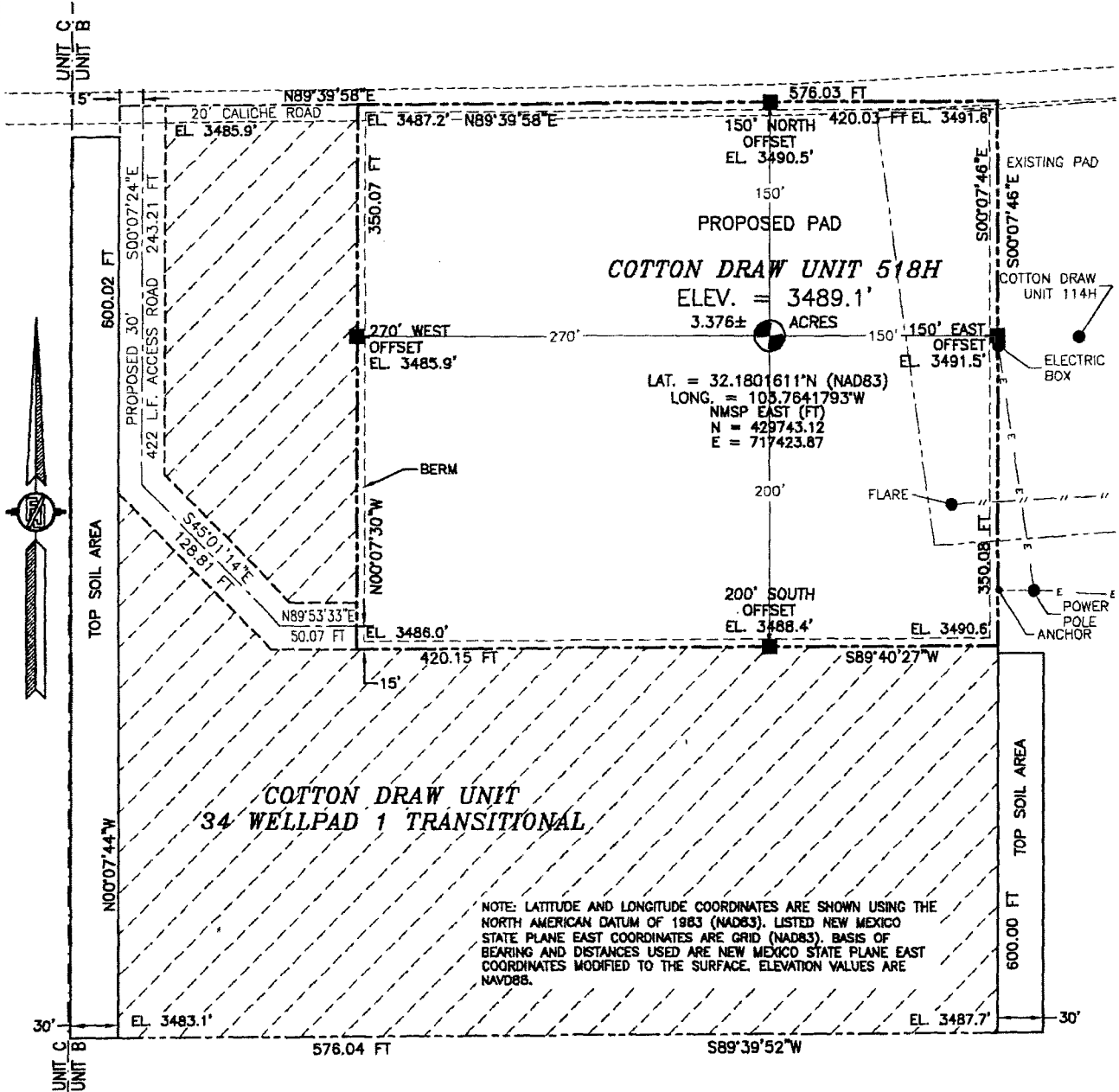
DEVON ENERGY PRODUCTION COMPANY, L.P.
GRADING PLAN AND CROSS SECTIONS
FOR COTTON DRAW UNIT 518H
SECTION 34, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

EARTHWORK QUANTITIES			
COTTON DRAW UNIT 34 WELLPAD 1 TRANSITIONAL			
CUT	FILL	NET	
0 CU. YD	58007 CU. YD	58007 CU. YD (FILL)	
EARTHWORK QUANTITIES ARE ESTIMATED			

MADRON SURVEYING, INC. JULY 18, 2017
301 SOUTH CANAL, SUITE 201, CARLSBAD, NEW MEXICO 88502

SHEET 2-2
SURVEY NO. 6336A

**SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY 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. ELEVATION VALUES ARE NAVD88.

010 50 100 200
SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM STATE HWY. 128 AND CR. 786 (BUCK JACKSON RD.), GO SOUTHWEST ON CR. 786 4.7 MILES, TURN LEFT ON CR. 781 (BUCK HORN) AND GO SOUTH 1.1 MILES, TURN LEFT ON CALICHE ROAD AND GO EAST 0.7 MILES TO THE NORTHWEST CORNER OF COTTON DRAW MDP PAD 34-1, THEN FOLLOW ROAD FLAGS SOUTH 243', THEN SOUTHEAST 129', THEN EAST 50' TO THE SOUTHWEST PAD CORNER FOR THIS LOCATION.

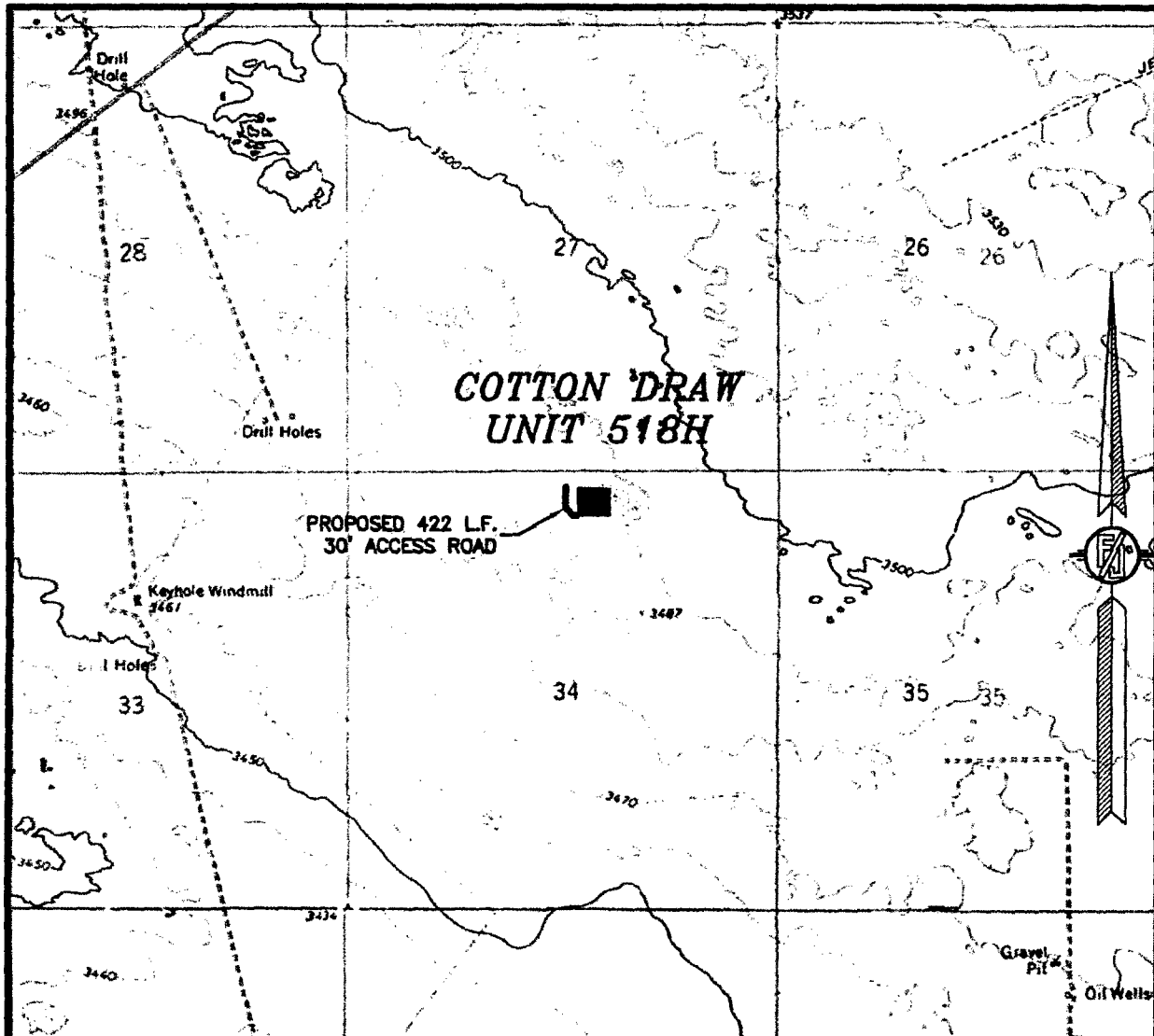
**DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 518H
LOCATED 330 FT. FROM THE NORTH LINE
AND 2185 FT. FROM THE EAST LINE OF
SECTION 34, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO**

JULY 18, 2017

SURVEY NO. 6336A

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

SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO
 LOCATION VERIFICATION MAP



USGS QUAD MAP:
 BIG SINKS

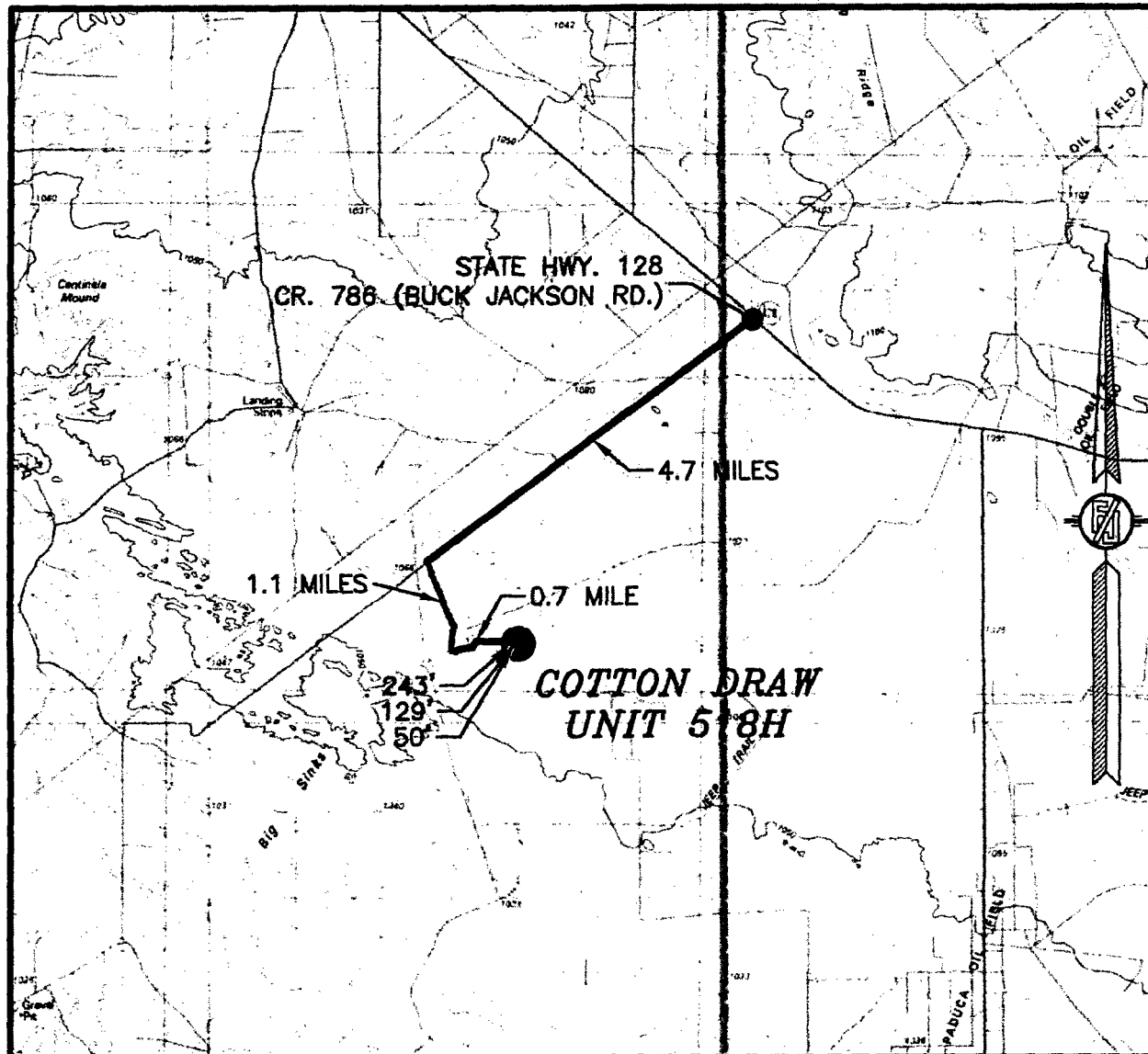
NOT TO SCALE

DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 518H
 LOCATED 330 FT. FROM THE NORTH LINE
 AND 2185 FT. FROM THE EAST LINE OF
 SECTION 34, TOWNSHIP 24 SOUTH,
 RANGE 31 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO

JULY 18, 2017

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO SURVEY NO. 5336A

SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DIRECTIONS TO LOCATION

FROM STATE HWY. 128 AND CR. 786 (BUCK JACKSON RD.), GO
SOUTHWEST ON CR. 786 4.7 MILES, TURN LEFT ON CR. 791 (BUCK
HORN) AND GO SOUTH 1.1 MILES, TURN LEFT ON CALICHE ROAD AND
GO EAST 0.7 MILES TO THE NORTHWEST CORNER OF COTTON DRAW
MOP PAD 34-1, THEN FOLLOW ROAD FLAGS SOUTH 243', THEN
SOUTHEAST 129', THEN EAST 50' TO THE SOUTHWEST PAD CORNER
FOR THIS LOCATION.

DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 518H

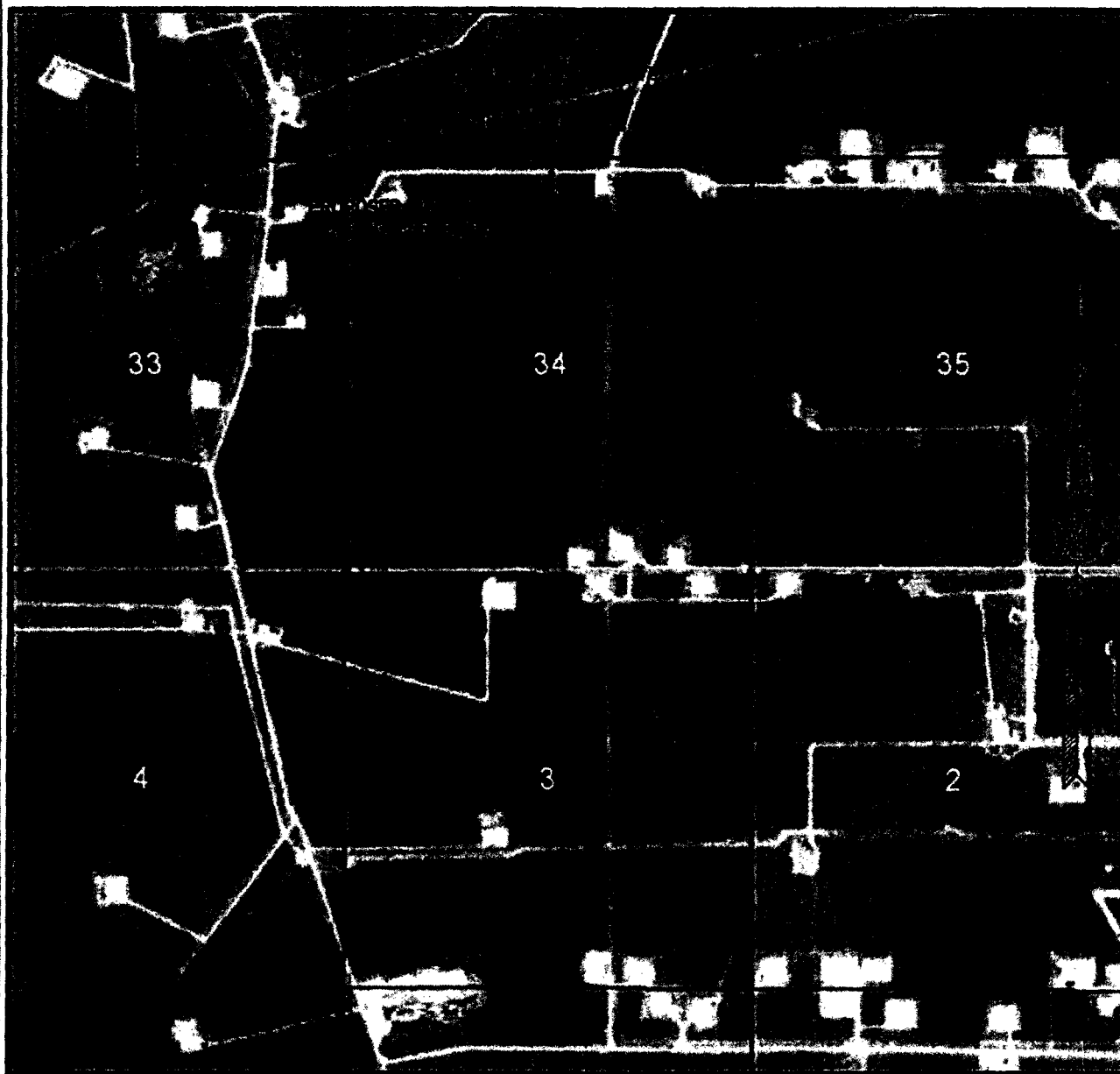
LOCATED 330 FT. FROM THE NORTH LINE
AND 2185 FT. FROM THE EAST LINE OF
SECTION 34, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 18, 2017

SURVEY NO. 5336A

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

SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
FEB. 2017

DEVON ENERGY PRODUCTION COMPANY, L.P.
COTTON DRAW UNIT 518H

LOCATED 330 FT. FROM THE NORTH LINE
AND 2185 FT. FROM THE EAST LINE OF
SECTION 34, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 18, 2017

SURVEY NO. 5336A

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

FLOWLINE PLAT

ONE 4" POLY FLOWLINE AND ONE 6" POLY GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 518H TO COTTON DRAW UNIT 26-35 BS CTB

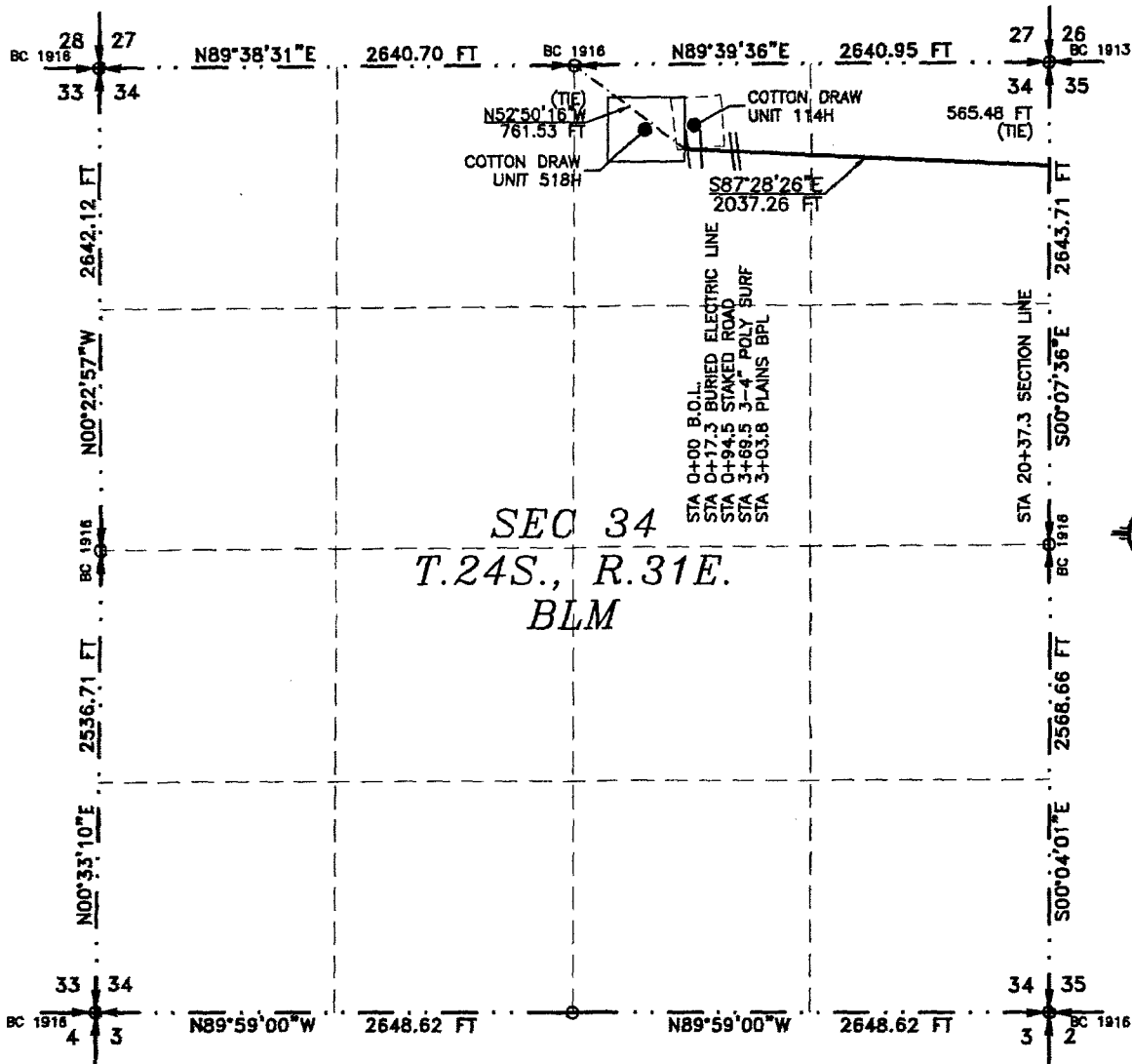
DEVON ENERGY PRODUCTION COMPANY, L.P.

CENTERLINE SURVEY OF A PIPELINE CROSSING

SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.

EDDY COUNTY, STATE OF NEW MEXICO

JULY 22, 2017



SEE NEXT SHEET (2-8) FOR DESCRIPTION

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.

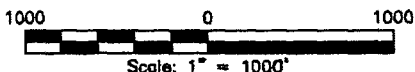
IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 12TH DAY OF JULY 2017

FILIMON F. JARAMILLO
SURVEYOR

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

SURVEY NO. 5367

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO



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: 1-8

FLOWLINE PLAT

ONE 4" POLY FLOWLINE AND ONE 6" POLY GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 518H TO COTTON DRAW UNIT 26-35 BS CTB

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF A PIPELINE CROSSING
SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 22, 2017

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE NW/4 NE/4 OF SAID SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N52°50'16"W, A DISTANCE OF 761.53 FEET;
THENCE S87°28'26"E A DISTANCE OF 2037.26 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTHEAST CORNER OF SAID SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N00°07'36"W, A DISTANCE OF 585.48 FEET;

SAID STRIP OF LAND BEING 2037.26 FEET OR 123.47 RODS IN LENGTH, CONTAINING 1.403 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NW/4 NE/4	714.75 L.F.	43.32 RODS	0.492 ACRES
NE/4 NE/4	1322.51 L.F.	80.15 RODS	0.911 ACRES

GENERAL NOTES

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

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

SHEET: 2-8

MADRON SURVEYING, INC.

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 23RD DAY OF JULY 2017.

FILMON F. JARAMILLO P.S. 12797

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

SURVEY NO. 5367

CARLSBAD, NEW MEXICO

FLOWLINE PLAT

ONE 4" POLY FLOWLINE AND ONE 6" POLY GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 518H TO COTTON DRAW UNIT 26-35 BS CTB

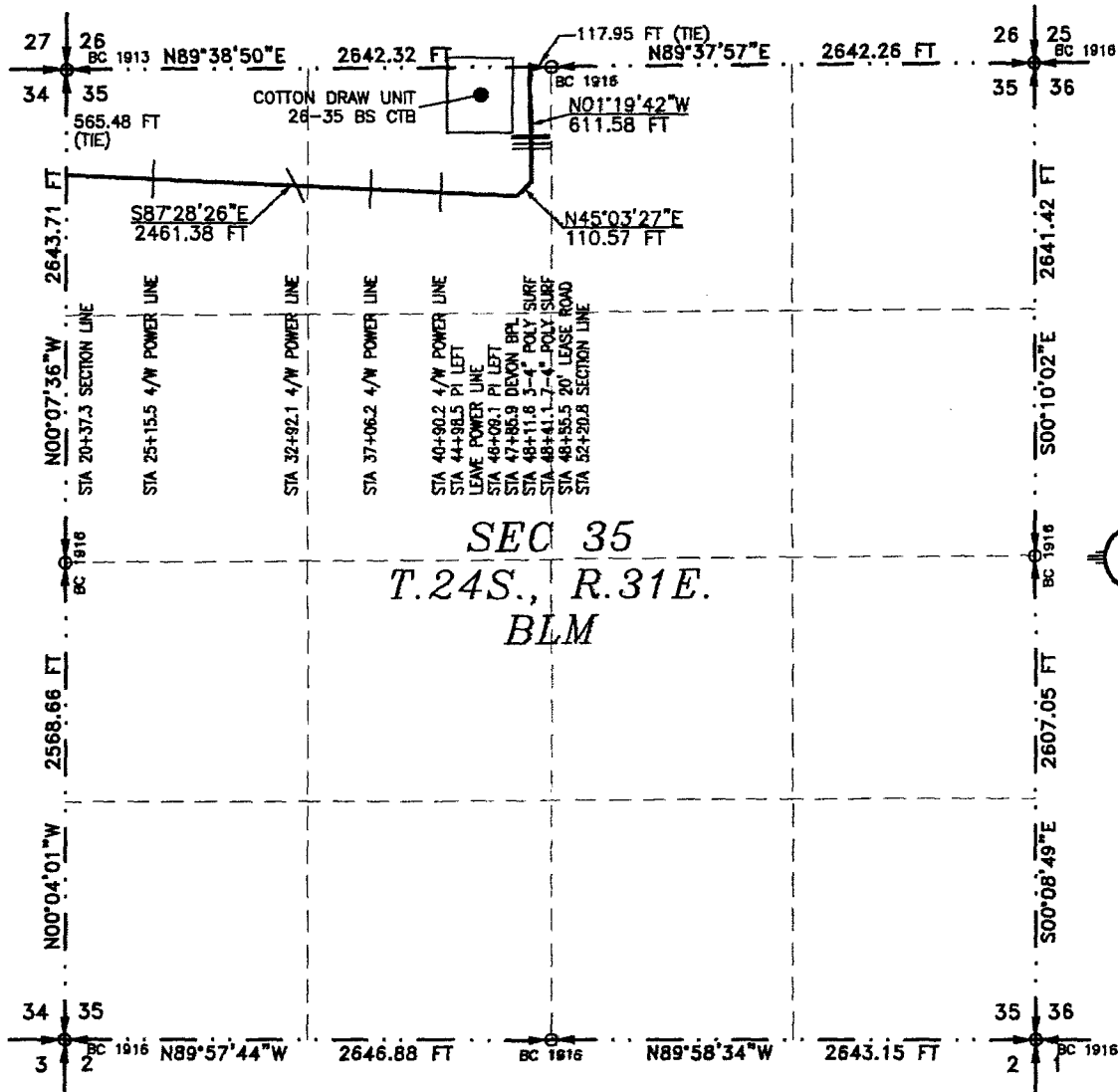
DEVON ENERGY PRODUCTION COMPANY, L.P.

CENTERLINE SURVEY OF A PIPELINE CROSSING

SECTION 35, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.

EDDY COUNTY, STATE OF NEW MEXICO

JULY 22, 2017



SEE NEXT SHEET (4-8) FOR DESCRIPTION

SURVEYOR CERTIFICATE

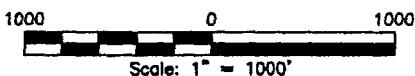
I, FILMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 22ND DAY OF JULY 2017.

FILMON F. JARAMILLO, SURVEYOR
NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797

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

SURVEY NO. 5367



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: 3-8

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

FLOWLINE PLAT

ONE 4" POLY FLOWLINE AND ONE 6" POLY GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 518H TO COTTON DRAW UNIT 26-35 BS CTB

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF A PIPELINE CROSSING
SECTION 35, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 22, 2017

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 35, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE NW/4 NW/4 OF SAID SECTION 35, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTHWEST CORNER OF SAID SECTION 35, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N00°07'36"W, A DISTANCE OF 565.48 FEET;
THENCE S87°28'26"E A DISTANCE OF 2461.38 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N45°03'27"E A DISTANCE OF 110.57 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N01°19'42"W A DISTANCE OF 611.58 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 35, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N89°38'50"E, A DISTANCE OF 117.95 FEET;

SAID STRIP OF LAND BEING 3183.53 FEET OR 192.94 RODS IN LENGTH, CONTAINING 2.193 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

NW/4 NW/4	1322.52 L.F.	80.15 RODS	0.911 ACRES
NE/4 NW/4	1861.01 L.F.	112.79 RODS	1.282 ACRES

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 22 DAY OF JULY 2017.

FILMON F. JARAMILLO PLS. 12797

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

GENERAL NOTES

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

SHEET: 4-8

MADRON SURVEYING, INC. 301 SOUTH CANAL CARLSBAD, NEW MEXICO

SURVEY NO. 5367

FLOWLINE PLAT

ONE 4" POLY FLOWLINE AND ONE 6" POLY GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 518H TO COTTON DRAW UNIT 26-35 BS CTB

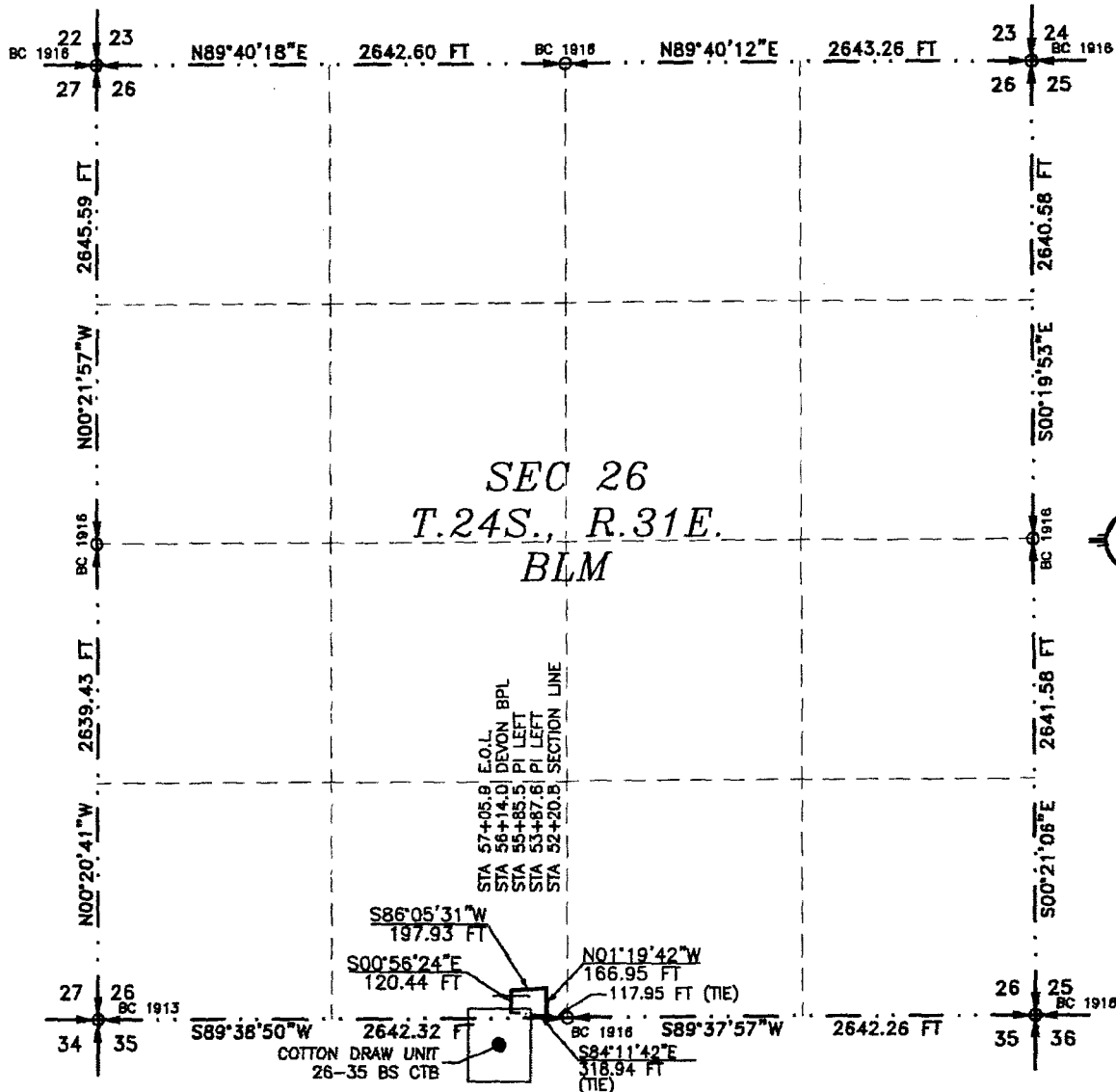
DEVON ENERGY PRODUCTION COMPANY, L.P.

CENTERLINE SURVEY OF A PIPELINE CROSSING

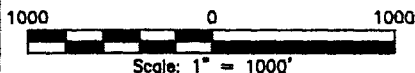
SECTION 26, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.

EDDY COUNTY, STATE OF NEW MEXICO

JULY 22, 2017



SEE NEXT SHEET (6-8) FOR DESCRIPTION



GENERAL NOTES

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

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

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD,

NEW MEXICO, THIS 22 DAY OF JULY 2017

FILMON F. JARAMILLO PLS. 12797

301 SOUTH CANAL
(575) 234-3341

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

SURVEY NO. 5367

MADRON SURVEYING, INC.

CARLSBAD, NEW MEXICO

SHEET: 5-8

FLOWLINE PLAT

ONE 4" POLY FLOWLINE AND ONE 6" POLY GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 518H TO COTTON DRAW UNIT 26-35 BS CTB

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF A PIPELINE CROSSING
SECTION 26, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 22, 2017

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 26, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE SE/4 SW/4 OF SAID SECTION 26, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE SOUTH QUARTER CORNER OF SAID SECTION 26, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N89°38'50"E, A DISTANCE OF 117.95 FEET;
THENCE N01°19'42"W A DISTANCE OF 166.95 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S86°05'31"W A DISTANCE OF 197.93 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S00°56'24"E A DISTANCE OF 120.44 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE SOUTH QUARTER CORNER OF SAID SECTION 26, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS S84°11'42"E, A DISTANCE OF 318.94 FEET;

SAID STRIP OF LAND BEING 485.32 FEET OR 29.41 RODS IN LENGTH, CONTAINING 0.334 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

SE/4 SW/4 485.32 L.F. 29.41 RODS 0.334 ACRES

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 22ND DAY OF JULY 2017

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: 6-8

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

SURVEY NO. 5367

FLOWLINE PLAT

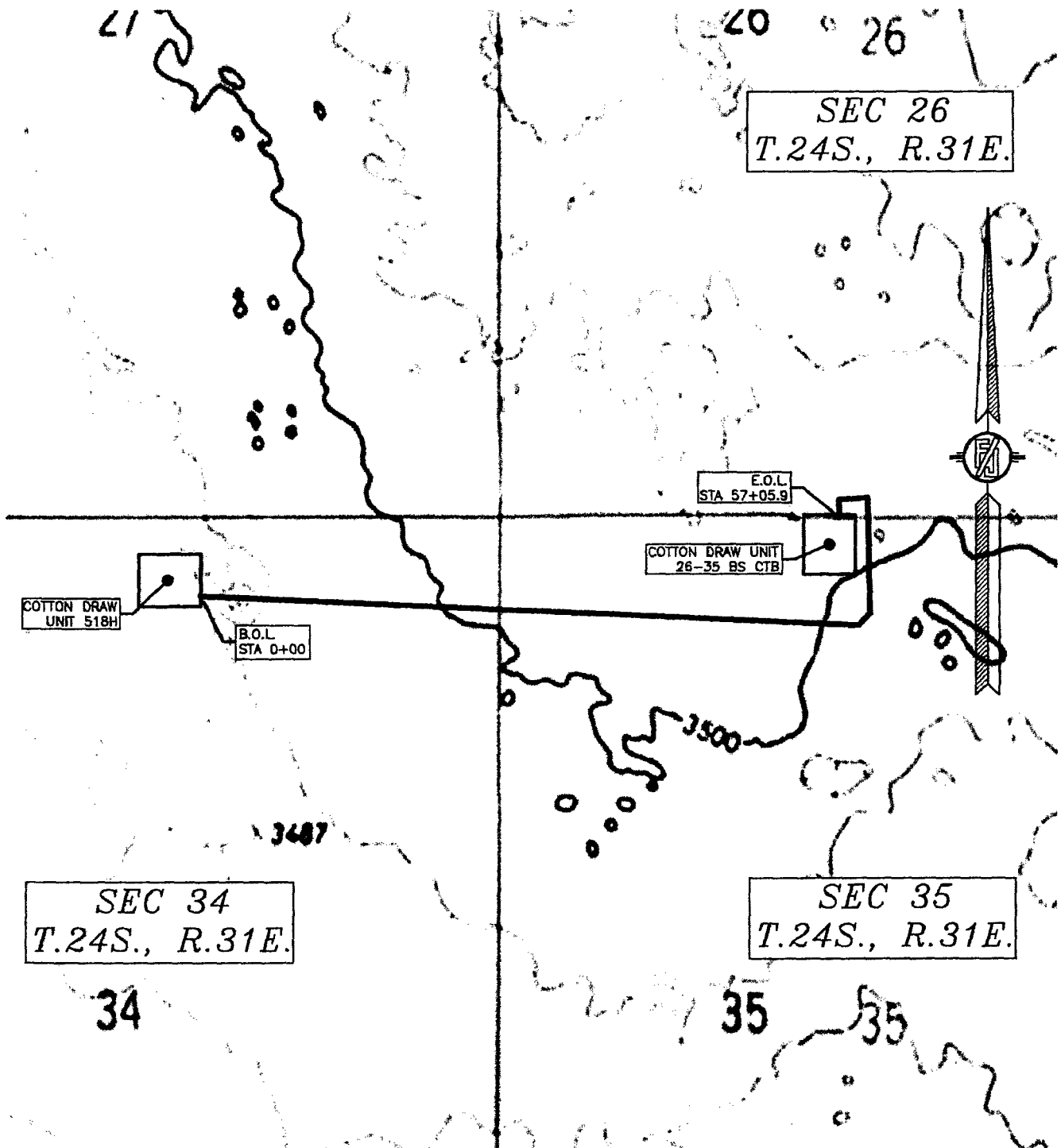
ONE 4" POLY FLOWLINE AND ONE 6" POLY GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 518H TO COTTON DRAW UNIT 26-35 BS CTB

DEVON ENERGY PRODUCTION COMPANY, L.P.

CENTERLINE SURVEY OF A PIPELINE CROSSING

SECTIONS 34, 35, & 26, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 22, 2017



FLOWLINE PLAT

ONE 4" POLY FLOWLINE AND ONE 6" POLY GAS LIFT LINE BURIED IN THE SAME DITCH
FROM COTTON DRAW UNIT 518H TO COTTON DRAW UNIT 26-35 BS CTB

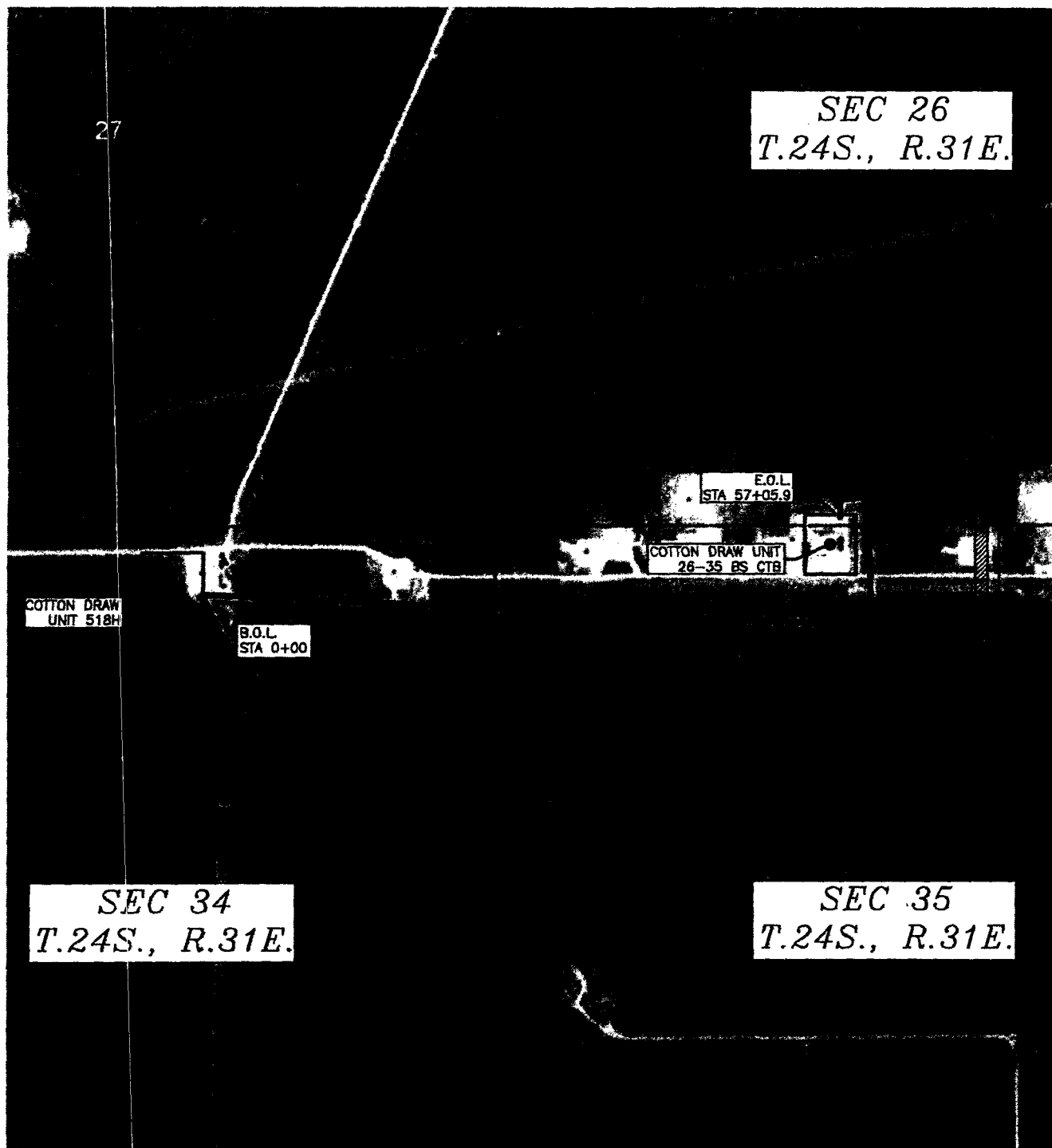
DEVON ENERGY PRODUCTION COMPANY, L.P.

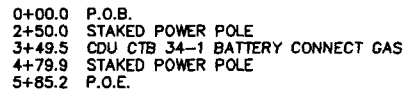
CENTERLINE SURVEY OF A PIPELINE CROSSING

SECTIONS 34, 35, & 26, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.

EDDY COUNTY, STATE OF NEW MEXICO

JULY 22, 2017





SHEET:
1 OF 4

SECTION 34, T24S-R31E, N.M.P.M.,
EDDY COUNTY, NEW MEXICO

ELECTRIC LINE PLAT

LEGAL DESCRIPTION

FOR

DEVON ENERGY PRODUCTION COMPANY, L.P.

BUREAU OF LAND MANAGEMENT

30' EASEMENT DESCRIPTION:

BEING an easement thirty (30) feet in width lying fifteen (15) feet on the right side and fifteen (15) feet on the left side of the survey centerline described below, being out of the northeast quarter (NE ¼) of Section 34, Township 24 South, Range 31 East, N.M.P.M., Eddy County, New Mexico, and being out of a parcel of land owned by the Bureau of Land Management. Said centerline of easement being more particularly described as follows:

Commencing from a 2" iron pipe w/BC for the northeast corner of Section 34, T24S-R31E, N.M.P.M., Eddy County, New Mexico;

Thence S 75°02'23" W a distance of 1982.80' to the **Point of Beginning** of this easement having coordinates of Northing=429574.18 feet, Easting=717692.27 feet and continuing the following courses;

Thence S 01°23'33" W a distance of 479.95' to an angle point;

Thence S 89°50'37" W a distance of 105.27' to the **Point of Ending** having coordinates of Northing=429094.08 feet, Easting=717575.34 feet, from said point a 1" iron pipe w/BC for the east quarter corner of Section 34, T24S-R31E bears S 50°59'32" E a distance of 2623.20', covering **585.22' or 35.47 rods** and having an area of **0.403 acres**.

NOTES:

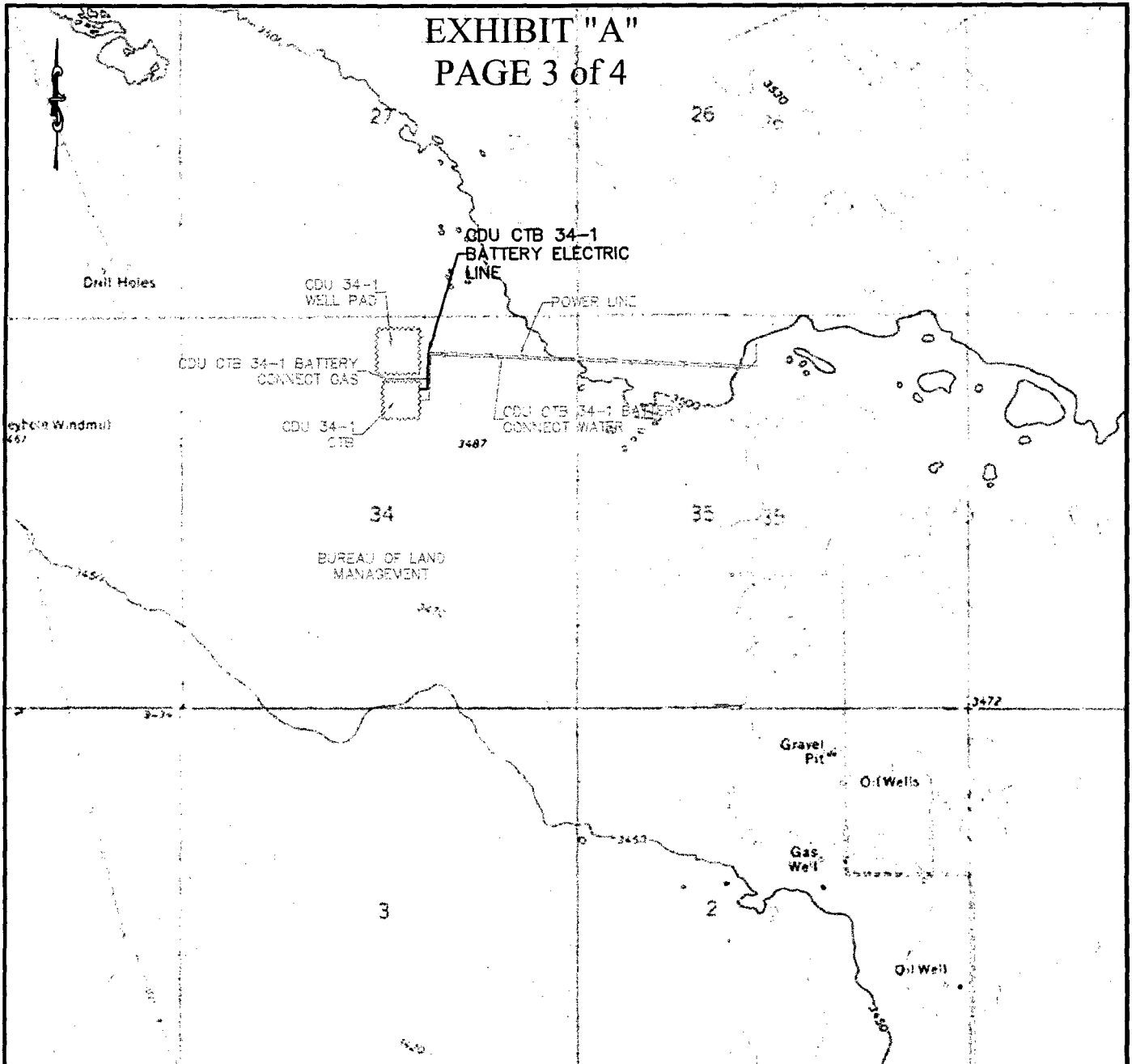
Bearings, distances and coordinates shown herein are based on New Mexico State Plane Coordinate System, NAD 83, East Zone 3001, US Survey Feet, all distances are grid.

I, E.L. Laman, New Mexico PLS No. 22404, hereby certify this survey to reflect an actual survey made on the ground under my supervision. This survey meets the minimum standards for surveying in New Mexico.


B.L. Laman PLS 22404
Date Signed: 08/23/2017
Horizon Row, LLC
924 Richardson Dr., Jasper, TX
(903) 388-3045 75951
Employee of Horizon Row, LLC



EXHIBIT "A"
PAGE 3 of 4



QUAD MAP

SECTION 34, T24S-R31E, N.M.P.M.
EDDY COUNTY, NEW MEXICO

HORIZON ROW LLC

DEVON ENERGY PRODUCTION CO., L.P.

PROPOSED 30' EASEMENT

Drawn by:
CHRIS MAAS

Date: 08/15/2017

Drawn for:



LINE NUMBER:
EL8040

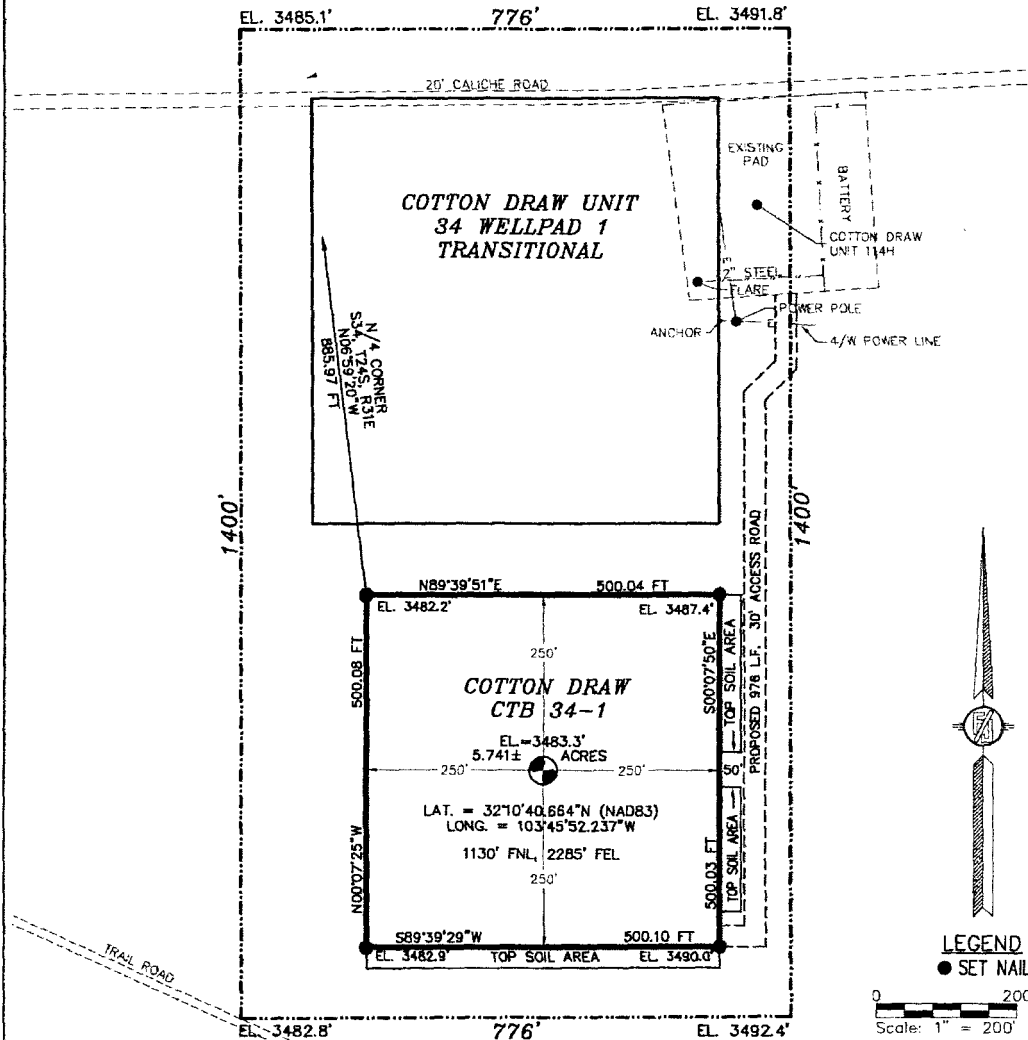
WBS NUMBER:
XX-123353.01

SCALE:
1" = 2000'

REVISIONS:

SHEET:
3 OF 4

DEVON ENERGY PRODUCTION COMPANY, L.P.
IN THE SW/4 NW/4 NE/4 & NW/4 SW/4 NE/4 OF
SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 18, 2017



A CERTAIN PIECE OR PARCEL OF LAND AND REAL ESTATE LYING IN BUREAU OF LAND MANAGEMENT LAND IN THE SW/4 NW/4 NE/4 & NW/4 SW/4 NE/4 OF SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO.

GENERAL NOTES

- 1.) THE INTENT OF THIS SURVEY IS TO ACQUIRE A BUSINESS LEASE FOR THE PURPOSE OF BUILDING A CENTRAL TANK BATTERY
- 2.) BASIS OF BEARING IS NEW MEXICO STATE PLANE EAST ZONE MODIFIED TO THE SURFACE (NAD83), COORDINATES ARE NAD 83, ELEVATIONS ARE NAVD 88

DRIVING DIRECTIONS: FROM STATE HWY. 128 AND CR. 786 (BUCK JACKSON RD.), GO SOUTHWEST ON CR. 786 4.7 MILES, TURN LEFT ON CR. 791 (BUCK HORN) AND GO SOUTH 1.1 MILES, TURN LEFT ON CALICHE ROAD AND GO EAST 0.8 MILES TO COTTON DRAW UNIT 114H, THEN FROM THE SOUTH EDGE OF PAD FOLLOW ROAD SURVEY 976" SOUTH TO THE SOUTHEAST PAD CORNER FOR THIS LOCATION.

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD,
NEW MEXICO, THIS 10 DAY OF JULY 2017

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

SHEET: 1-3

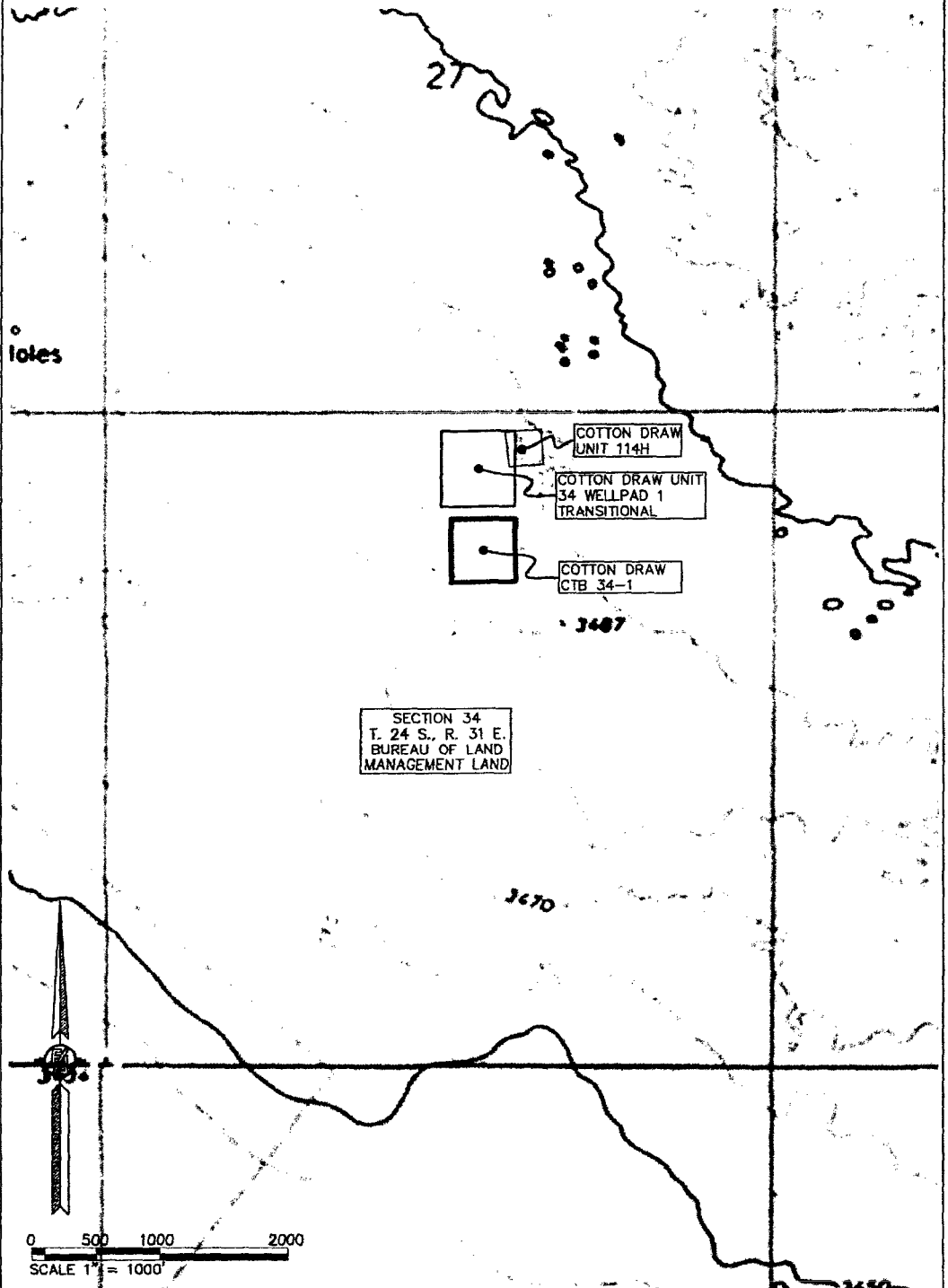
MADRON SURVEYING, INC. 201 SOUTH CANAL
(575) 234-3341 **CARLSBAD, NEW MEXICO**

COTTON DRAW CTB 34-1

DEVON ENERGY PRODUCTION COMPANY, L.P.
IN THE SW/4 NW/4 NE/4 & NW/4 SW/4 NE/4 OF
SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 18, 2017

QUAD MAP

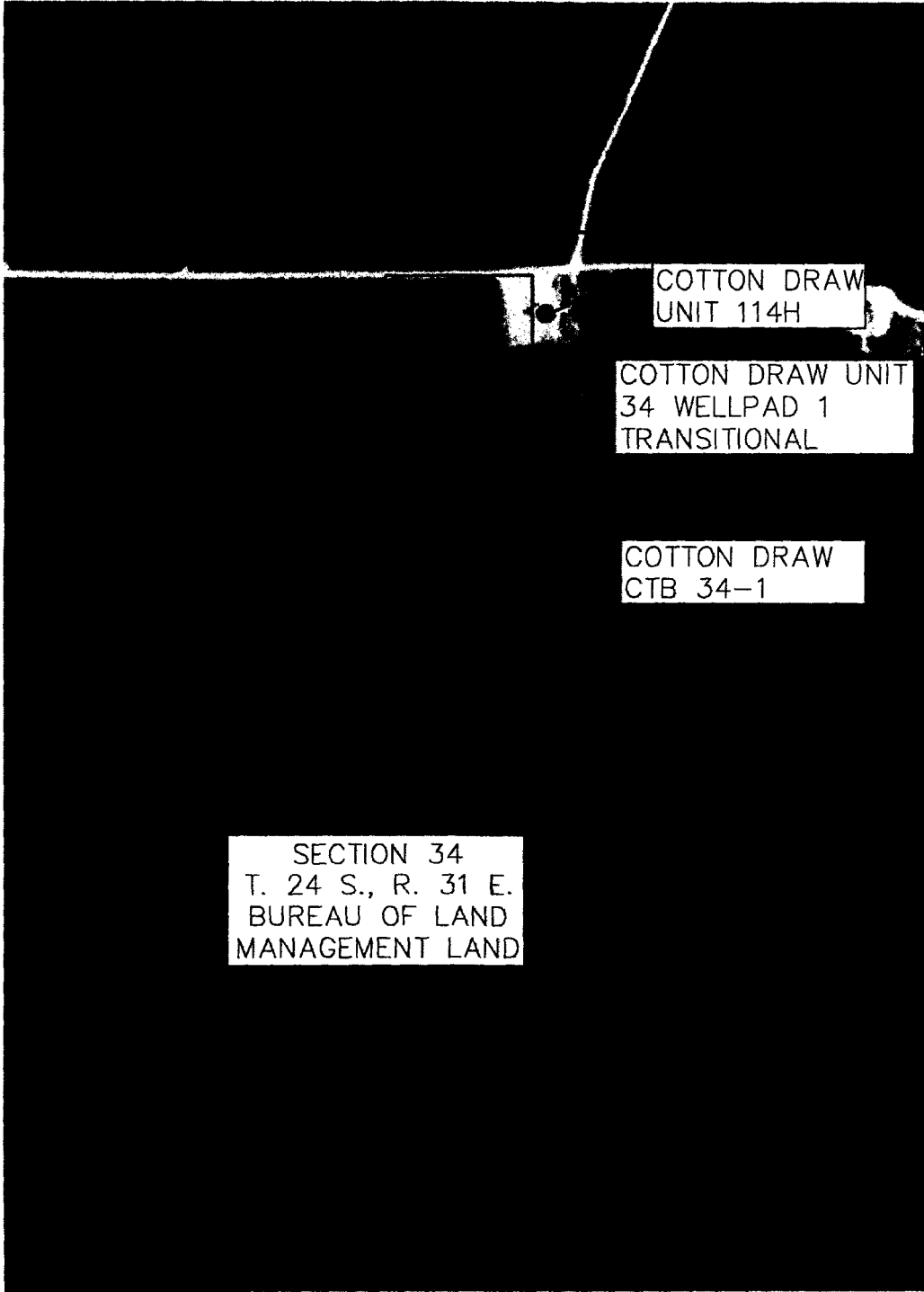


COTTON DRAW CTB 34-1

DEVON ENERGY PRODUCTION COMPANY, L.P.
IN THE SW/4 NW/4 NE/4 & NW/4 SW/4 NE/4 OF
SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

JULY 18, 2017

AERIAL PHOTO



COTTON DRAW
UNIT 114H

COTTON DRAW UNIT
34 WELLPAD 1
TRANSITIONAL

COTTON DRAW
CTB 34-1

SECTION 34
T. 24 S., R. 31 E.
BUREAU OF LAND
MANAGEMENT LAND

SHEET: 3-3

MADRON SURVEYING, INC.

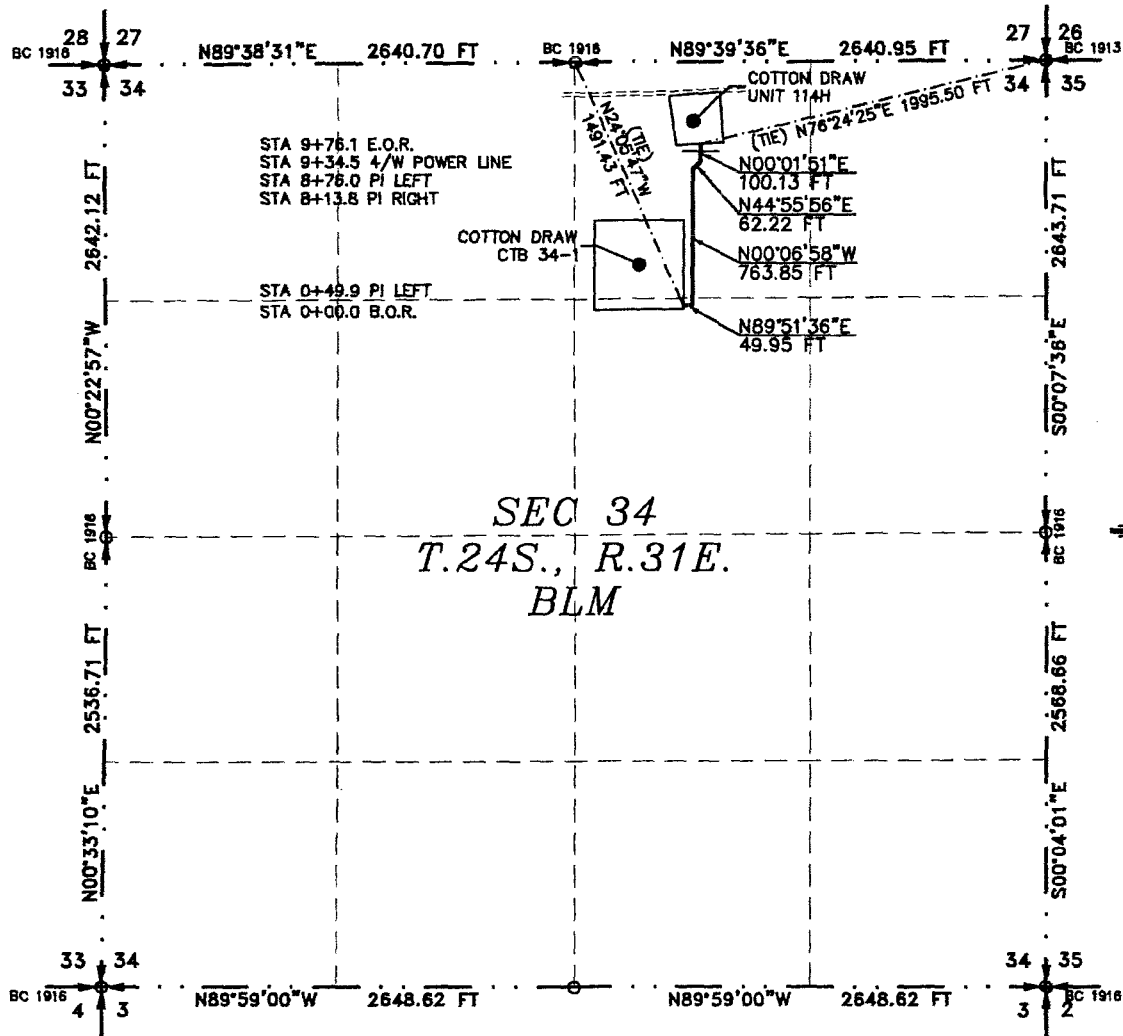
321 SOUTH CANAL
(575) 234-3341

CARLSBAD, NEW MEXICO

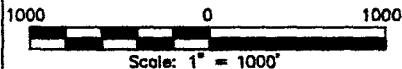
SURVEY NO. 5340A

ACCESS ROAD PLAT
ACCESS ROAD FOR COTTON DRAW CTB 34-1

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 18, 2017



SEE NEXT SHEET (2-2) FOR DESCRIPTION



GENERAL NOTES

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

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

SHEET: 1-2

MADRON SURVEYING, INC.

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 18 DAY OF JULY 2017

FILMON F. JARAMILLO
NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797
MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SURVEY NO. 5340A

CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT
ACCESS ROAD FOR COTTON DRAW CTB 34-1

DEVON ENERGY PRODUCTION COMPANY, L.P.
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO
JULY 18, 2017

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., EDDY COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE SW/4 NE/4 OF SAID SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M., WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N24°05'47"W, A DISTANCE OF 1491.43 FEET;
THENCE N89°51'36"E A DISTANCE OF 49.95 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N00°06'58"W A DISTANCE OF 763.85 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N44°55'56"E A DISTANCE OF 62.22 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N00°01'51"E A DISTANCE OF 100.13 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTHEAST CORNER OF SAID SECTION 34, TOWNSHIP 24 SOUTH, RANGE 31 EAST, N.M.P.M. BEARS N76°24'25"E, A DISTANCE OF 1995.50 FEET;

SAID STRIP OF LAND BEING 976.15 FEET OR 59.16 RODS IN LENGTH, CONTAINING 0.672 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

SW/4 NE/4	93.31 L.F.	5.66 RODS	0.064 ACRES
NW/4 NE/4	882.84 L.F.	53.51 RODS	0.608 ACRES

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 20 DAY OF JULY 2017

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

SURVEY NO. 5340A

PLAN VIEW



0 60 120 240
SCALE 1" = 120'

DEVON ENERGY PRODUCTION COMPANY, L.P.
PAD ELEVATIONS AND CROSS SECTIONS
FOR COTTON DRAW CTB 34-1
SECTION 34, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.,
EDDY COUNTY, STATE OF NEW MEXICO

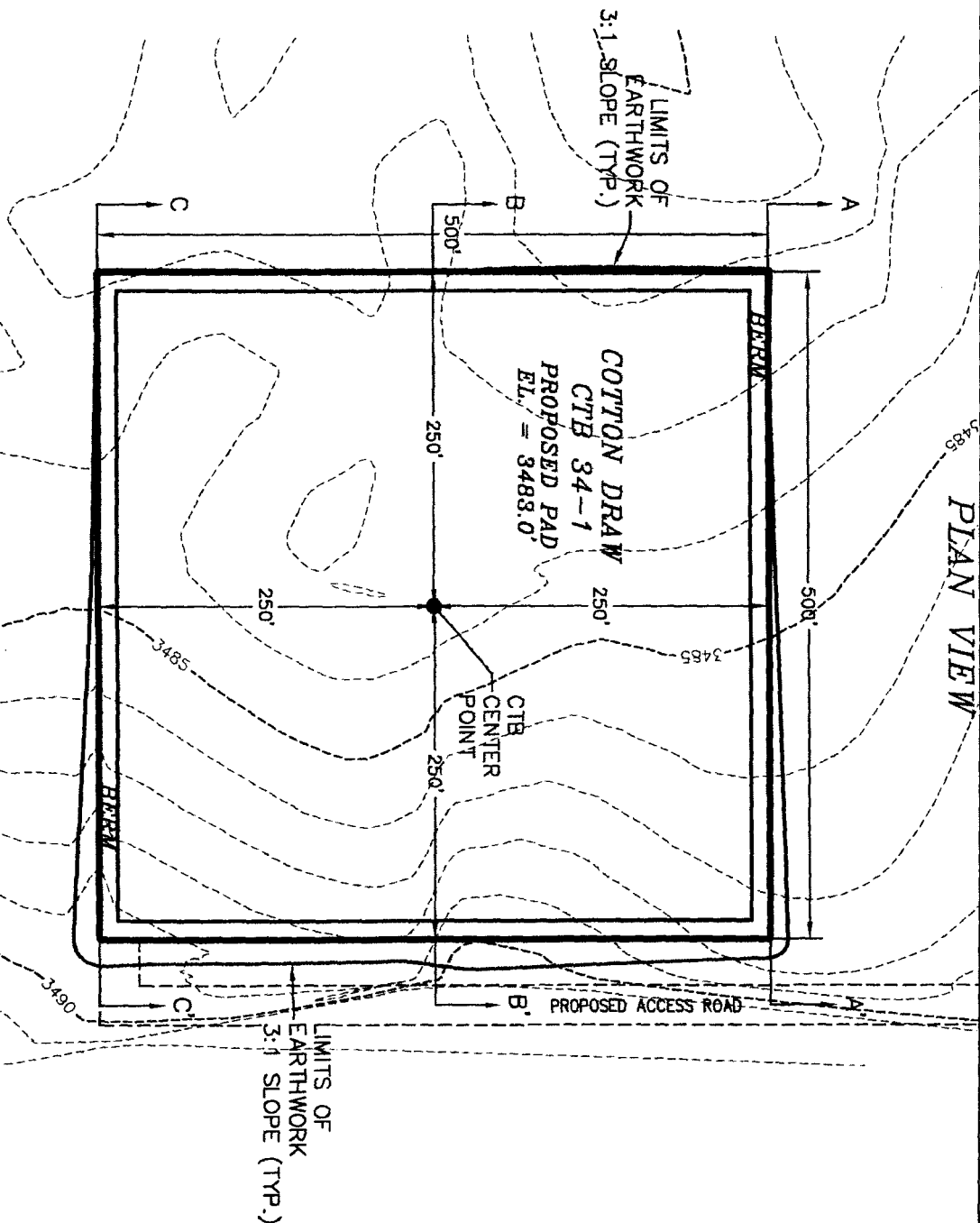
JULY 18, 2017

MADRON SURVEYING, INC. 300 SOUTH CANAL (978) 234-3341 CARLSBAD, NEW MEXICO

SHEET 1-2 SURVEY NO. 6840A

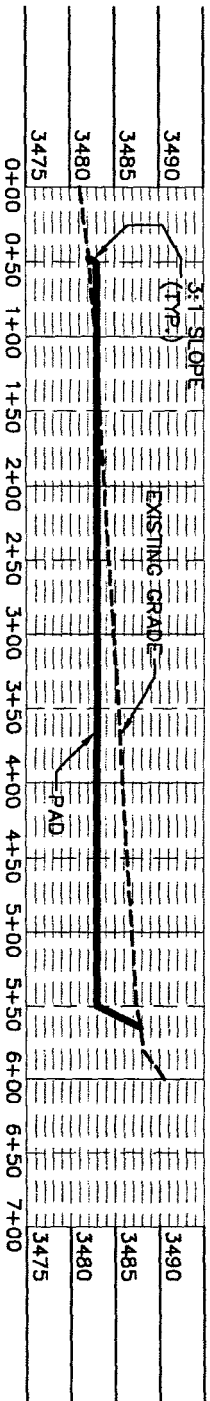
CUT	FILL	NET
19542 CU. YD.	832 CU. YD.	18710 CU. YD. (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

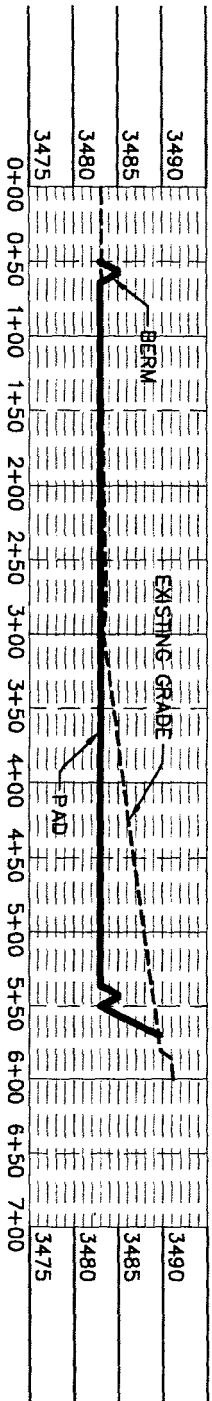


CROSS-SECTIONS

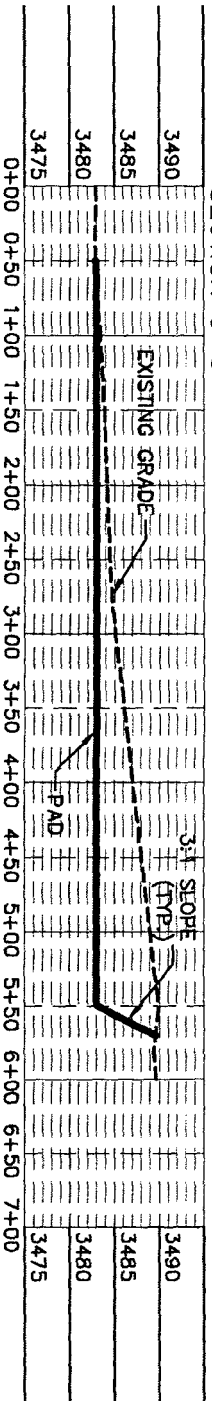
SECTION A-A'



SECTION B-B'



SECTION C-C'



0+2 60 120 240
SCALE 1" = 120' - 1" = 20' VER

DEVON ENERGY PRODUCTION COMPANY, L.P.
PAD ELEVATIONS AND CROSS SECTIONS
FOR COTTON DRAIN CTB 84-1
SECTION 34, TOWNSHIP 24 SOUTH,
RANGE 31 EAST, N.M.P.M.
EDDY COUNTY, STATE OF NEW MEXICO

CUT	FILL	NET
19542 CU. YD.	832 CU. YD.	18710 CU. YD. (CUT)

EARTHWORK QUANTITIES ARE ESTIMATED

MADRON SURVEYING, INC. 301 SOUTH CANAL, JULY 18, 2017
CARLSBAD, NEW MEXICO

SHEET 2-2
SURVEY NO. 6340A



U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

PWD Data Report

01/25/2018

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 type:

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:



U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Bond Info Data Report

01/25/2018

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: