

Thistle Unit 30H- APD DRILLING PLAN
Updated 10/16/15 – Target Formation Change

Casing Program:

<u>Hole Size</u>	<u>Hole Interval</u>	<u>OD Csg</u>	<u>Casing Interval</u>	<u>Weight</u>	<u>Collar</u>	<u>Grade</u>
17-1/2"	0 – 1,350	13-3/8"	0 – 1,350	54.5#	BTC	J-55
12-1/4"	1,350 – 4,300	9-5/8"	0 – 5,200	40#	BTC	J-55
12-1/4"	4,300-5,200	9-5/8"	0 – 5,200	40#	BTC	HCK-55
8-3/4"	5,200– 19,357	5-1/2"	0 – 19,357	17#	BTC	P-110RY

Max TVD in lateral: 9,613-ft

Design Factors:

<u>Casing Size</u>	<u>Collapse Design Factor</u>	<u>Burst Design Factor</u>	<u>Tension Design Factor</u>
13-3/8", 54.5#, J-55, BTC	1.64	3.68	10.73
9-5/8" 40# J-55 BTC	1.15	3.43	4.69
9-5/8" 40# HCK-55 BTC	1.57	4.63	6.07
5-1/2" 17# HCP-110 BTC	1.79	2.55	3.68

All casing strings utilized are new.

Mud Program:

<u>Depth</u>	<u>Mud Wt.</u>	<u>Visc.</u>	<u>Fluid Loss</u>	<u>Type System</u>
0 – 1,350	8.8-9.0	30 – 34	N/C	FW
1,350 – 5,200	9.8 – 10.0	28 – 32	N/C	Brine
5,200– 19,357	8.6 – 9.0	28 – 32	N/C-12	FW

Pressure Control Equipment:

The BOP system used to drill the intermediate hole will consist of a 13-5/8" 3M Double Ram and Annular preventer. The BOP system will be tested as per BLM Onshore Oil and Gas Order No. 2 as a 3M system prior to drilling out the surface casing shoe.

The BOP system used to drill the production hole will consist of a 13-5/8" 3M Double Ram and Annular preventer. The BOP system will be tested as per BLM Onshore Oil and Gas Order No. 2 as a 3M system prior to drilling out the intermediate casing shoe.

The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at 5,000 psi WP.

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Cement Summary:

Casing	# Sks	Wt. lb/ gal	H ₂ O gal/sk	Yld ft ³ / sack	500# Comp. Strength (hours)	Slurry Description
13-3/8" Surface	680	13.5	9.28	1.74	10	Lead: Class C Cement + 4% Gel + 1% Calcium Chloride + 0.125 lbs/sack Poly-E-Flake
	550	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
13-3/8" Surface Two Stage	440	13.5	9.28	1.74	10	Lead: Class C Cement + 4% Gel + 1% Calcium Chloride + 0.125 lbs/sack Poly-E-Flake
	550	14.8	6.32	1.33	6	1 st Stage Primary: Class C Cement + 0.125 lbs/sack Poly-E-Flake
	DV Tool = 300ft					
	320	14.8	6.32	1.33	6	2 nd Stage Primary: Class C Cement + 0.125 lbs/sack Poly-E-Flake
9-5/8" Inter.	1090	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
	430	14.8	6.32	1.33	6	Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake
5-1/2" Prod Single Stage	560	11.9	12.89	2.31	n/a	Lead: (50:50) Class H Cement: Poz (Fly Ash) + 10% BWOC Bentonite + 1 lb/sk of Kol-Seal + 0.3% BWOC HR-601 + 0.5lb/sk D-Air 5000
	2700	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
5-1/2" Prod Two Stage	530	11.9	12.89	2.31	n/a	1 st Stage Lead: (50:50) Class H Cement: Poz (Fly Ash) + 10% BWOC Bentonite + 1 lb/sk of Kol-Seal + 0.3% BWOC HR-601 + 0.5lb/sk D-Air 5000
	2700	14.5	5.31	1.2	25	1 st Stage 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
	DV Tool = 5250ft					
	20	11	14.81	2.55	22	2 nd Stage Lead: Tuned Light® Cement + 0.125 lb/sk Pol-E-Flake
	30	14.8	6.32	1.33	6	2 nd Stage Tail: Class C Cement + 0.125 lbs/sack Poly-E-Flake

DV tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
13-3/8" Surface Single Stage Option	0'	100%
13-3/8" Surface Two Stage Option	1 st Stage = 300' / 2 nd Stage = 0'	100%
9-5/8" Intermediate Single Stage Option	0'	75%
5-1/2" Production Casing Single Stage Option	5000'	25%
5-1/2" Production Casing Two Stage Option	1 st Stage = 5250' / 2 nd Stage = 5000'	25%

CONDITIONS OF APPROVAL

SUNDRY dated 10/20/2015

OPERATOR'S NAME:	Devon Energy Production Company, L.P.
LEASE NO.:	NMNM-94186
WELL NAME & NO.:	Thistle Unit 30H
SURFACE HOLE FOOTAGE:	0280' FNL & 0380' FWL
BOTTOM HOLE FOOTAGE:	0330' FSL & 0380' FWL
LOCATION:	Section 28, T. 23 S., R 33 E., NMPM
COUNTY:	Lea County, New Mexico

Original COA still stand with the following modification:

I. DRILLING

A. DRILLING OPERATIONS REQUIREMENTS

Original COA still stand with the following modification:

B. CASING

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

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. **DURING THIS WOC TIME, NO DRILL PIPE, ETC. SHALL BE RUN IN THE HOLE.** 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, Castile, Delaware and Bone Spring.
Possibility of lost circulation in the Delaware and Bone Spring.**

1. The 13-3/8 inch surface casing shall be set at approximately 1370 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.

Proposed Primary Cement Job as follows:

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

Proposed Contingency Cement Job if experience loss returns and hole condits warrant a two stage job as follows:

Operator has proposed DV tool at depth of 300', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage..

- a. First stage to DV tool:

- ☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation or approved top of cement on the next stage.
- b. Second stage above DV tool:
 - ☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office.
- 2. The minimum required fill of cement behind the 9-5/8 inch intermediate casing to be **set approx... 5200 feet** and is:
 - ☒ Cement to surface. If cement does not circulate see B.1.a, c-d above and contact the appropriate 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:

Proposed Primary Cement Job as follows:

- ☒ Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

Proposed Contingency Cement Job if experience loss returns and hole condits warrant a two stage job as follows:

Operator has proposed DV tool at depth of 5,250', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage.

- c. First stage to DV tool:

- ☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve circulation or approved top of cement on the next stage.
- d. Second stage above DV tool:
 - ☒ Cement to surface. If cement does not circulate, contact the appropriate BLM office.
- 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 53.
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).
3. 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**.
4. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. **In a water basin**, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength

(including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.
- c. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. 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.
- d. The results of the test shall be reported to the appropriate BLM office.
- e. All tests are required to be recorded on a calibrated test chart. **A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.**
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

EGF 122315



Thistle Unit 30H
Lea Co, NM

Plan Data for Thistle Unit 30H

Plan Point Information:									
Dogleg Severity Unit: */100.00ft Position offsets from Slot centre									
MD	Inc	Az	TVD	+N/-S	+E/-W	Northing	Easting	VSec	DLS
(USft)	(°)	(°)	(USft)	(USft)	(USft)	(USft)	(USft)	(USft)	(DLSU)
0.00	0.00	0.00	0.00	0.00	0.00	467200.70	772731.45	0.00	0.00
9102.87	0.00	0.00	9102.87	0.00	0.00	467200.70	772731.45	0.00	0.00
9302.87	20.00	179.59	9298.83	-34.55	0.25	467166.14	772731.70	34.55	10.00
9886.21	90.00	179.59	9613.00	-483.21	3.48	466717.49	772734.94	483.22	12.00
19357.10	90.00	179.59	9613.00	-9953.86	72.00	457246.84	772803.45	9954.12	0.00

Plan Data for Thistle Unit 30H

Target Set Information:						
Name: Thistle Unit 30H Tgts						
Position offsets from Slot centre						
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape Comment
(USft)	(USft)	(USft)	(USft)	(USft)	(USft)	
PBHL 30H	9613.00	-9953.86	72.00	457246.84	772803.45	Cuboid

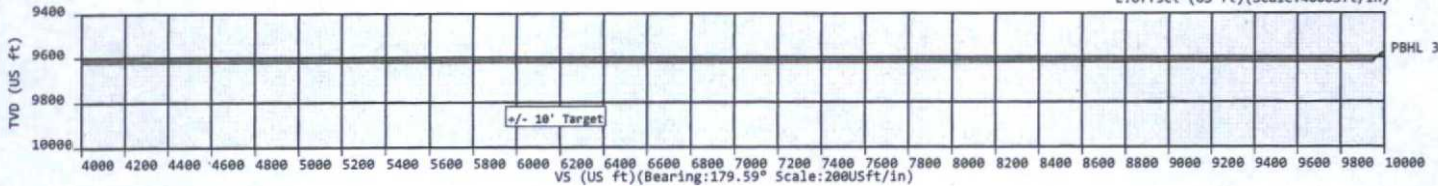
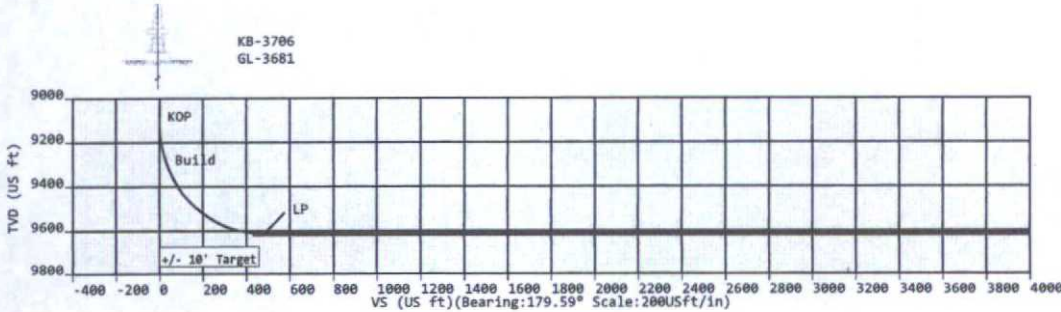
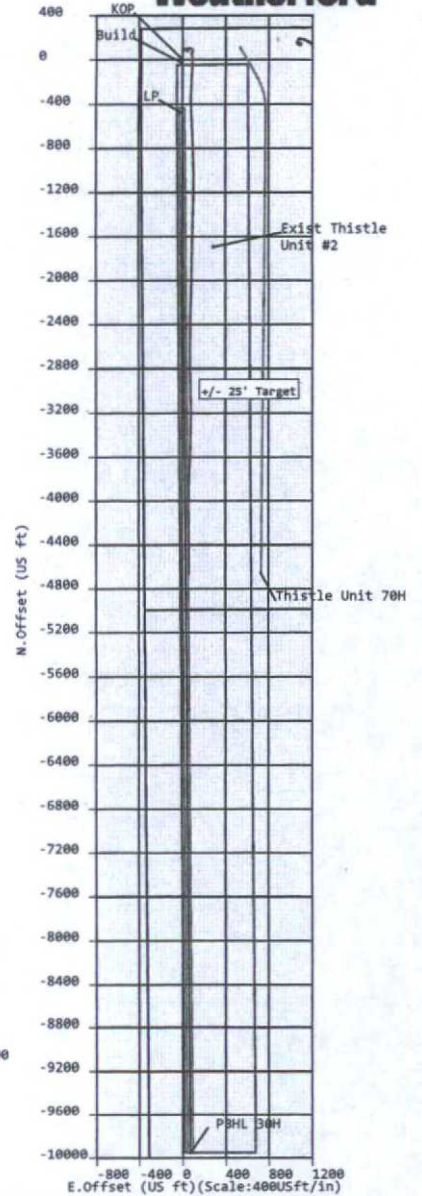
Plan Data for Thistle Unit 30H

Slot: Thistle Unit 30H			
Position:			
Offset is from Site centre			
+N/-S: 0.00USft	Northing: 467200.70USft	Latitude: 32°16'55.9"	
+E/-W: 0.00USft	Easting: 772731.45USft	Longitude: -103°35'4.5"	
Elevation Above VRD: 3681.00USft			

Thistle Unit 30H	_____
Thistle Unit 52H	_____
Exist. Thistle Unit #18H	_____
Exist Thistle Unit #2	_____
Thistle Unit 53H	_____
Thistle Unit 70H	_____



Weatherford



**5D Plan Report**

Devon Energy

Field Name: *Lea Co, NM Nad 83 NMEZ*
Site Name: *Thistle Unit 30H*
Well Name: *Thistle Unit 30H*
Plan: *P1:V1*

15 October 2015





Thistle Unit 30H

Field Name: Lea Co, NM Nad 83 NMEZ	Map Units: US ft		Company Name: Devon Energy	
	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD83 / New Mexico East (ftUS)			
	Comment:			
Site: Thistle Unit 30H	Units: US ft	North Reference: Grid	Convergence Angle: 0.40	
	Position:	Northing: 467200.70US ft	Latitude: 32° 16' 55.88"	
		Easting: 772731.45US ft	Longitude: -103° 35' 4.49"	
	Elevation above MSL:3681.00 US ft			
Comment:				
Slot: Thistle Unit 30H	Position (Relative to Site Centre)			
	+N/-S: 0.00US ft	Northing: 467200.70US ft	Latitude: 32°16'55.88"	
	+E/-W: 0.00US ft	Easting: 772731.45US ft	Longitude: -103°35'4.49"	
	Slot TVD Reference: Ground Elevation			
	Elevation above MSL: 3681.00US ft			
	Comment:			
Well: Thistle Unit 30H	Type:Main well	UWI:	Plan:P1:V1	
	File Number:	Comment:		
	Closure Distance:9954.12US ft	Closure Azimuth:179.59°		
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: 0.00US ft	+E/-W: 0.00US ft	Az: 179.59°	
	Magnetic Parameters:			
	Model: bggm2015	Field Strength: 48232.7nT	Declination: 7.22°	Dip: 60.19°
			Date: 30/Nov/2015	

Drill floor: Plan: P1:V1

Rig Height (Kelly Bushing): Elevation above MSL: 25.00us ft Inclination: 0.00° Azimuth: 0.00°
3706.00us ft

Target set: Thistle Unit 30H Tgts Comment:

Target Name:	Shape:	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	Northing (USft)	Easting (USft)	Comment
PBHL 30H	Cuboid	9613.00	-9953.86	72.00	457246.84	772803.45	

Wellpath created using minimum curvature.

Tie Point:

MD: 0.00USft **Inclination:** 0.00° **Azimuth:** 0.00° **TVD:** 0.00USft **North Offset:** 0.00USft **East Offset:** 0.00USft

5D Plan Report

Salient Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)

MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (%/100US ft)	B.Rate (%/100US ft)	T.Rate (%/100US ft)	T.Face (°)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	
9102.87	0.00	0.00	9102.87	0.00	0.00	-0.00	0.00	0.00	0.00	0.00	KOP
9302.87	20.00	179.59	9298.83	-34.55	0.25	34.55	10.00	10.00	0.00	179.59	Build
9886.21	90.00	179.59	9613.00	-483.21	3.48	483.22	12.00	12.00	-0.00	360.00	LP
19357.10	90.00	179.59	9613.00	-9953.86	72.00	9954.12	0.00	0.00	0.00	0.00	PBHL 30H

Interpolated Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)

MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (%/100US ft)	Northing (US ft)	Easting (US ft)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
100.00	0.00	0.00	100.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
200.00	0.00	0.00	200.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
300.00	0.00	0.00	300.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
400.00	0.00	0.00	400.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
500.00	0.00	0.00	500.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
600.00	0.00	0.00	600.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
700.00	0.00	0.00	700.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
800.00	0.00	0.00	800.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
900.00	0.00	0.00	900.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
1000.00	0.00	0.00	1000.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
1100.00	0.00	0.00	1100.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
1200.00	0.00	0.00	1200.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
1300.00	0.00	0.00	1300.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
1400.00	0.00	0.00	1400.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
1500.00	0.00	0.00	1500.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
1600.00	0.00	0.00	1600.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
1700.00	0.00	0.00	1700.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
1800.00	0.00	0.00	1800.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
1900.00	0.00	0.00	1900.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
2000.00	0.00	0.00	2000.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
2100.00	0.00	0.00	2100.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
2200.00	0.00	0.00	2200.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
2300.00	0.00	0.00	2300.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
2400.00	0.00	0.00	2400.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
2500.00	0.00	0.00	2500.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
2600.00	0.00	0.00	2600.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
2700.00	0.00	0.00	2700.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
2800.00	0.00	0.00	2800.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
2900.00	0.00	0.00	2900.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
3000.00	0.00	0.00	3000.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
3100.00	0.00	0.00	3100.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
3200.00	0.00	0.00	3200.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
3300.00	0.00	0.00	3300.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
3400.00	0.00	0.00	3400.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
3500.00	0.00	0.00	3500.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
3600.00	0.00	0.00	3600.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
3700.00	0.00	0.00	3700.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
3800.00	0.00	0.00	3800.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
3900.00	0.00	0.00	3900.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
4000.00	0.00	0.00	4000.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
4100.00	0.00	0.00	4100.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
4200.00	0.00	0.00	4200.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
4300.00	0.00	0.00	4300.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
4400.00	0.00	0.00	4400.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
4500.00	0.00	0.00	4500.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
4600.00	0.00	0.00	4600.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
4700.00	0.00	0.00	4700.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
4800.00	0.00	0.00	4800.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
4900.00	0.00	0.00	4900.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	

5D Plan Report

Interpolated Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	DLS (°/100US ft)	Northing (US ft)	Easting (US ft)	Comment
5000.00	0.00	0.00	5000.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
5100.00	0.00	0.00	5100.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
5200.00	0.00	0.00	5200.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
5300.00	0.00	0.00	5300.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
5400.00	0.00	0.00	5400.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
5500.00	0.00	0.00	5500.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
5600.00	0.00	0.00	5600.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
5700.00	0.00	0.00	5700.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
5800.00	0.00	0.00	5800.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
5900.00	0.00	0.00	5900.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
6000.00	0.00	0.00	6000.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
6100.00	0.00	0.00	6100.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
6200.00	0.00	0.00	6200.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
6300.00	0.00	0.00	6300.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
6400.00	0.00	0.00	6400.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
6500.00	0.00	0.00	6500.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
6600.00	0.00	0.00	6600.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
6700.00	0.00	0.00	6700.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
6800.00	0.00	0.00	6800.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
6900.00	0.00	0.00	6900.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
7000.00	0.00	0.00	7000.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
7100.00	0.00	0.00	7100.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
7200.00	0.00	0.00	7200.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
7300.00	0.00	0.00	7300.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
7400.00	0.00	0.00	7400.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
7500.00	0.00	0.00	7500.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
7600.00	0.00	0.00	7600.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
7700.00	0.00	0.00	7700.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
7800.00	0.00	0.00	7800.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
7900.00	0.00	0.00	7900.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
8000.00	0.00	0.00	8000.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
8100.00	0.00	0.00	8100.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
8200.00	0.00	0.00	8200.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
8300.00	0.00	0.00	8300.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
8400.00	0.00	0.00	8400.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
8500.00	0.00	0.00	8500.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
8600.00	0.00	0.00	8600.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
8700.00	0.00	0.00	8700.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
8800.00	0.00	0.00	8800.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
8900.00	0.00	0.00	8900.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
9000.00	0.00	0.00	9000.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
9100.00	0.00	0.00	9100.00	0.00	0.00	-0.00	0.00	467200.70	772731.45	
9102.87	0.00	0.00	9102.87	0.00	0.00	-0.00	0.00	467200.70	772731.45	KOP
9200.00	9.71	179.59	9199.54	-8.21	0.06	8.21	10.00	467192.48	772731.51	
9300.00	19.71	179.59	9296.13	-33.58	0.24	33.58	10.00	467167.12	772731.69	
9302.87	20.00	179.59	9298.83	-34.55	0.25	34.55	10.00	467166.14	772731.70	Build
9400.00	31.66	179.59	9386.11	-76.80	0.55	76.80	12.00	467123.90	772732.00	
9500.00	43.66	179.59	9465.14	-137.77	0.99	137.78	12.00	467062.92	772732.44	
9600.00	55.66	179.59	9529.76	-213.85	1.54	213.85	12.00	466986.85	772732.99	
9700.00	67.66	179.59	9577.15	-301.70	2.17	301.70	12.00	466899.00	772733.62	
9800.00	79.66	179.59	9605.24	-397.48	2.86	397.49	12.00	466803.22	772734.32	
9886.20	90.00	179.59	9613.00	-483.21	3.48	483.22	12.00	466717.49	772734.94	LP
9900.00	90.00	179.59	9613.00	-497.00	3.58	497.02	0.00	466703.69	772735.04	
10000.00	90.00	179.59	9613.00	-597.00	4.31	597.02	0.00	466603.69	772735.76	
10100.00	90.00	179.59	9613.00	-697.00	5.03	697.02	0.00	466503.70	772736.48	
10200.00	90.00	179.59	9613.00	-797.00	5.75	797.02	0.00	466403.70	772737.21	
10300.00	90.00	179.59	9613.00	-896.99	6.48	897.02	0.00	466303.70	772737.93	
10400.00	90.00	179.59	9613.00	-996.99	7.20	997.02	0.00	466203.70	772738.65	
10500.00	90.00	179.59	9613.00	-1096.99	7.92	1097.02	0.00	466103.71	772739.38	

5D Plan Report

Interpolated Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
MD (US ft)	Incl (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (%/100US ft)	Northing (US ft)	Easting (US ft)	Comment
10600.00	90.00	179.59	9613.00	-1196.99	8.65	1197.02	0.00	466003.71	772740.10	
10700.00	90.00	179.59	9613.00	-1296.98	9.37	1297.02	0.00	465903.71	772740.82	
10800.00	90.00	179.59	9613.00	-1396.98	10.09	1397.02	0.00	465803.71	772741.55	
10900.00	90.00	179.59	9613.00	-1496.98	10.82	1497.02	0.00	465703.72	772742.27	
11000.00	90.00	179.59	9613.00	-1596.98	11.54	1597.02	0.00	465603.72	772742.99	
11100.00	90.00	179.59	9613.00	-1696.97	12.26	1697.02	0.00	465503.72	772743.72	
11200.00	90.00	179.59	9613.00	-1796.97	12.99	1797.02	0.00	465403.73	772744.44	
11300.00	90.00	179.59	9613.00	-1896.97	13.71	1897.02	0.00	465303.73	772745.16	
11400.00	90.00	179.59	9613.00	-1996.97	14.44	1997.02	0.00	465203.73	772745.89	
11500.00	90.00	179.59	9613.00	-2096.96	15.16	2097.02	0.00	465103.73	772746.61	
11600.00	90.00	179.59	9613.00	-2196.96	15.88	2197.02	0.00	465003.74	772747.33	
11700.00	90.00	179.59	9613.00	-2296.96	16.61	2297.02	0.00	464903.74	772748.06	
11800.00	90.00	179.59	9613.00	-2396.95	17.33	2397.02	0.00	464803.74	772748.78	
11900.00	90.00	179.59	9613.00	-2496.95	18.05	2497.02	0.00	464703.74	772749.50	
12000.00	90.00	179.59	9613.00	-2596.95	18.78	2597.02	0.00	464603.75	772750.23	
12100.00	90.00	179.59	9613.00	-2696.95	19.50	2697.02	0.00	464503.75	772750.95	
12200.00	90.00	179.59	9613.00	-2796.94	20.22	2797.02	0.00	464403.75	772751.67	
12300.00	90.00	179.59	9613.00	-2896.94	20.95	2897.02	0.00	464303.75	772752.40	
12400.00	90.00	179.59	9613.00	-2996.94	21.67	2997.02	0.00	464203.76	772753.12	
12500.00	90.00	179.59	9613.00	-3096.94	22.39	3097.02	0.00	464103.76	772753.84	
12600.00	90.00	179.59	9613.00	-3196.93	23.12	3197.02	0.00	464003.76	772754.57	
12700.00	90.00	179.59	9613.00	-3296.93	23.84	3297.02	0.00	463903.76	772755.29	
12800.00	90.00	179.59	9613.00	-3396.93	24.56	3397.02	0.00	463803.77	772756.01	
12900.00	90.00	179.59	9613.00	-3496.93	25.29	3497.02	0.00	463703.77	772756.74	
13000.00	90.00	179.59	9613.00	-3596.92	26.01	3597.02	0.00	463603.77	772757.46	
13100.00	90.00	179.59	9613.00	-3696.92	26.73	3697.02	0.00	463503.78	772758.19	
13200.00	90.00	179.59	9613.00	-3796.92	27.46	3797.02	0.00	463403.78	772758.91	
13300.00	90.00	179.59	9613.00	-3896.92	28.18	3897.02	0.00	463303.78	772759.63	
13400.00	90.00	179.59	9613.00	-3996.91	28.90	3997.02	0.00	463203.78	772760.36	
13500.00	90.00	179.59	9613.00	-4096.91	29.63	4097.02	0.00	463103.79	772761.08	
13600.00	90.00	179.59	9613.00	-4196.91	30.35	4197.02	0.00	463003.79	772761.80	
13700.00	90.00	179.59	9613.00	-4296.91	31.07	4297.02	0.00	462903.79	772762.53	
13800.00	90.00	179.59	9613.00	-4396.90	31.80	4397.02	0.00	462803.79	772763.25	
13900.00	90.00	179.59	9613.00	-4496.90	32.52	4497.02	0.00	462703.80	772763.97	
14000.00	90.00	179.59	9613.00	-4596.90	33.24	4597.02	0.00	462603.80	772764.70	
14100.00	90.00	179.59	9613.00	-4696.89	33.97	4697.02	0.00	462503.80	772765.42	
14200.00	90.00	179.59	9613.00	-4796.89	34.69	4797.02	0.00	462403.80	772766.14	
14300.00	90.00	179.59	9613.00	-4896.89	35.41	4897.02	0.00	462303.81	772766.87	
14400.00	90.00	179.59	9613.00	-4996.89	36.14	4997.02	0.00	462203.81	772767.59	
14500.00	90.00	179.59	9613.00	-5096.88	36.86	5097.02	0.00	462103.81	772768.31	
14600.00	90.00	179.59	9613.00	-5196.88	37.58	5197.02	0.00	462003.81	772769.04	
14700.00	90.00	179.59	9613.00	-5296.88	38.31	5297.02	0.00	461903.82	772769.76	
14800.00	90.00	179.59	9613.00	-5396.88	39.03	5397.02	0.00	461803.82	772770.48	
14900.00	90.00	179.59	9613.00	-5496.87	39.75	5497.02	0.00	461703.82	772771.21	
15000.00	90.00	179.59	9613.00	-5596.87	40.48	5597.02	0.00	461603.82	772771.93	
15100.00	90.00	179.59	9613.00	-5696.87	41.20	5697.02	0.00	461503.83	772772.65	
15200.00	90.00	179.59	9613.00	-5796.87	41.92	5797.02	0.00	461403.83	772773.38	
15300.00	90.00	179.59	9613.00	-5896.86	42.65	5897.02	0.00	461303.83	772774.10	
15400.00	90.00	179.59	9613.00	-5996.86	43.37	5997.02	0.00	461203.84	772774.82	
15500.00	90.00	179.59	9613.00	-6096.86	44.10	6097.02	0.00	461103.84	772775.55	
15600.00	90.00	179.59	9613.00	-6196.86	44.82	6197.02	0.00	461003.84	772776.27	
15700.00	90.00	179.59	9613.00	-6296.85	45.54	6297.02	0.00	460903.84	772776.99	
15800.00	90.00	179.59	9613.00	-6396.85	46.27	6397.02	0.00	460803.85	772777.72	
15900.00	90.00	179.59	9613.00	-6496.85	46.99	6497.02	0.00	460703.85	772778.44	
16000.00	90.00	179.59	9613.00	-6596.85	47.71	6597.02	0.00	460603.85	772779.16	
16100.00	90.00	179.59	9613.00	-6696.84	48.44	6697.02	0.00	460503.85	772779.89	
16200.00	90.00	179.59	9613.00	-6796.84	49.16	6797.02	0.00	460403.86	772780.61	
16300.00	90.00	179.59	9613.00	-6896.84	49.88	6897.02	0.00	460303.86	772781.33	
16400.00	90.00	179.59	9613.00	-6996.83	50.61	6997.02	0.00	460203.86	772782.06	

5D Plan Report

Interpolated Points: (Relative to Slot centre)(TVD relative to Kelly Bushing)										
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N. Offset (US ft)	E. Offset (US ft)	VS (US ft)	DLS (%/100US ft)	Northing (US ft)	Easting (US ft)	Comment
16500.00	90.00	179.59	9613.00	-7096.83	51.33	7097.02	0.00	460103.86	772782.78	
16600.00	90.00	179.59	9613.00	-7196.83	52.05	7197.02	0.00	460003.87	772783.50	
16700.00	90.00	179.59	9613.00	-7296.83	52.78	7297.02	0.00	459903.87	772784.23	
16800.00	90.00	179.59	9613.00	-7396.82	53.50	7397.02	0.00	459803.87	772784.95	
16900.00	90.00	179.59	9613.00	-7496.82	54.22	7497.02	0.00	459703.87	772785.67	
17000.00	90.00	179.59	9613.00	-7596.82	54.95	7597.02	0.00	459603.88	772786.40	
17100.00	90.00	179.59	9613.00	-7696.82	55.67	7697.02	0.00	459503.88	772787.12	
17200.00	90.00	179.59	9613.00	-7796.81	56.39	7797.02	0.00	459403.88	772787.85	
17300.00	90.00	179.59	9613.00	-7896.81	57.12	7897.02	0.00	459303.89	772788.57	
17400.00	90.00	179.59	9613.00	-7996.81	57.84	7997.02	0.00	459203.89	772789.29	
17500.00	90.00	179.59	9613.00	-8096.81	58.56	8097.02	0.00	459103.89	772790.02	
17600.00	90.00	179.59	9613.00	-8196.80	59.29	8197.02	0.00	459003.89	772790.74	
17700.00	90.00	179.59	9613.00	-8296.80	60.01	8297.02	0.00	458903.90	772791.46	
17800.00	90.00	179.59	9613.00	-8396.80	60.73	8397.02	0.00	458803.90	772792.19	
17900.00	90.00	179.59	9613.00	-8496.80	61.46	8497.02	0.00	458703.90	772792.91	
18000.00	90.00	179.59	9613.00	-8596.79	62.18	8597.02	0.00	458603.90	772793.63	
18100.00	90.00	179.59	9613.00	-8696.79	62.90	8697.02	0.00	458503.91	772794.36	
18200.00	90.00	179.59	9613.00	-8796.79	63.63	8797.02	0.00	458403.91	772795.08	
18300.00	90.00	179.59	9613.00	-8896.78	64.35	8897.02	0.00	458303.91	772795.80	
18400.00	90.00	179.59	9613.00	-8996.78	65.07	8997.02	0.00	458203.91	772796.53	
18500.00	90.00	179.59	9613.00	-9096.78	65.80	9097.02	0.00	458103.92	772797.25	
18600.00	90.00	179.59	9613.00	-9196.78	66.52	9197.02	0.00	458003.92	772797.97	
18700.00	90.00	179.59	9613.00	-9296.77	67.24	9297.02	0.00	457903.92	772798.70	
18800.00	90.00	179.59	9613.00	-9396.77	67.97	9397.02	0.00	457803.92	772799.42	
18900.00	90.00	179.59	9613.00	-9496.77	68.69	9497.02	0.00	457703.93	772800.14	
19000.00	90.00	179.59	9613.00	-9596.77	69.41	9597.02	0.00	457603.93	772800.87	
19100.00	90.00	179.59	9613.00	-9696.76	70.14	9697.02	0.00	457503.93	772801.59	
19200.00	90.00	179.59	9613.00	-9796.76	70.86	9797.02	0.00	457403.93	772802.31	
19300.00	90.00	179.59	9613.00	-9896.76	71.58	9897.02	0.00	457303.94	772803.04	
19357.10	90.00	179.59	9613.00	-9953.86	72.00	9954.12	0.00	457246.84	772803.45	PBHL 30H

**5D Anti-Collision Report**

Devon Energy**Field Name:** *Lea Co, NM Nad 83 NMEZ***Site Name:** *Thistle Unit 30H***Well Name:** *Thistle Unit 30H*

15 October 2015





Thistle Unit 30H

Field Name: Lea Co, NM Nad 83 NMEZ	Map Units: US ft		Company Name: Devon Energy	
	Vertical Reference Datum (VRD): Mean Sea Level			
	Projected Coordinate System: NAD83 / New Mexico East (ftUS)			
	Comment:			
Site: Thistle Unit 30H	Units: US ft	North Reference: Grid	Convergence Angle: 0.40	
	Position:	Northing: 467200.70US ft	Latitude: 32° 16' 55.88"	
		Easting: 772731.45US ft	Longitude: -103° 35' 4.49"	
	Elevation above MSL:3681.00 US ft			
Comment:				
Slot: Thistle Unit 30H	Position (Relative to Site Centre)			
	+N/-S: 0.00US ft	Northing: 467200.70US ft	Latitude: 32°16'55.88"	
	+E/-W: 0.00US ft	Easting: 772731.45US ft	Longitude: -103°35'4.49"	
	Slot TVD Reference: Ground Elevation			
Elevation above MSL: 3681.00US ft				
Comment:				
Well: Thistle Unit 30H	Type:Main well		UWI:	Plan:Working Plan
	File Number:	Comment:		
	Closure Distance:9954.12US ft		Closure Azimuth:179.59°	
	Vertical Section: Position of Origin (Relative to Slot centre)			
	+N/-S: 0.00US ft		+E/-W: 0.00US ft	Az: 179.59°
	Magnetic Parameters:			
	Model: bggm2015	Field Strength:	Declination: 7.22°	Dip: 60.19°
	48232.7nT		Date:	30/Nov/2015

Drill floor: Plan: Working Plan		
Rig Height (Kelly Bushing): 25.00us ft	Elevation above MSL: 3706.00us ft	Inclination: 0.00°
		Azimuth: 0.00°

Collision / Uncertainty Analysis				
Primary Well	Start MD (USFt)	End MD (USFt)	Collision Risk Interval	No. of Std. Deviations in Error Computation
Thistle Unit 30H (p)	0.00	30000.00	100.00	2

Secondary Well Names:

Thistle Unit 51H (s)
Exist Thistle Unit #2 (s)
Thistle Unit 70H (p)

Anti-Collision Report Terminology

S.Minor, S.Major: Radil of the ellipse of uncertainty at the current location as seen in the along hole direction.

PHI: Angle between high-side vector and semi-minor axis

TVD Spread: Total TVD range of the ellipsoid of uncertainty at the current location.

ES: Distance between the extremities of the primary and secondary uncertainty ellipsoids in the direction Cr-Cr.

T.Face to Sec: Angle between the HI-Side vector of the primary well at the current location and line of closest approach between the two wells.

5D Anti-Collision Report

AC Filter Info: the following filter has been applied: Depth Range.

Separation factors calculated using Pedal Curve (Independent Uncertainty). Surface Uncertainty (S.U.) Not Applied. Wellpath created using minimum curvature.

Anti-Collision Summary (TVD relative to Kelly Bushing)

SF	Secondary Well Name	Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	ES (US ft)	CC (US ft)	SF	Risk
	Exist Thistle Unit #2 (s)	11167.97	9613.00	9627.10	79.79	267.41	1.43	SF(Med)
	Thistle Unit 51H (s)	9120.90	9120.90	9125.67	90.61	127.73	3.44	
	Thistle Unit 70H (p)	9241.02	9239.68	9243.68	510.35	552.11	13.22	

Primary Well: Thistle Unit 30H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)

MD (US ft)	TVD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
0.00	0.00	31.76	0.00	0.00	0.00	Thistle Unit 51H (s)	91.60	92.22	148.42	
100.00	100.00	31.78	0.11	0.11	4.60	Thistle Unit 51H (s)	91.56	92.43	107.11	
200.00	200.00	31.91	0.34	0.34	4.62	Thistle Unit 51H (s)	91.26	92.55	71.67	
300.00	300.00	32.15	0.56	0.56	4.65	Thistle Unit 51H (s)	90.76	92.49	53.20	
400.00	400.00	32.41	0.79	0.79	4.70	Thistle Unit 51H (s)	90.26	92.48	41.66	
500.00	500.00	32.76	1.01	1.01	4.75	Thistle Unit 51H (s)	89.72	92.42	34.24	
600.00	600.00	32.86	1.24	1.24	4.82	Thistle Unit 51H (s)	89.27	92.32	30.22	
700.00	700.00	32.68	1.46	1.46	4.90	Thistle Unit 51H (s)	88.77	92.11	27.54	
800.00	800.00	32.47	1.69	1.69	4.98	Thistle Unit 51H (s)	88.24	91.92	24.97	
900.00	900.00	32.22	1.91	1.91	5.07	Thistle Unit 51H (s)	87.79	91.83	22.74	
1000.00	1000.00	31.81	2.14	2.14	5.18	Thistle Unit 51H (s)	87.21	91.64	20.70	
1100.00	1100.00	31.28	2.36	2.36	5.29	Thistle Unit 51H (s)	86.41	91.26	18.83	
1200.00	1200.00	30.74	2.59	2.59	5.40	Thistle Unit 51H (s)	85.50	90.78	17.20	
1300.00	1300.00	30.16	2.81	2.81	5.52	Thistle Unit 51H (s)	84.77	90.49	15.82	
1400.00	1400.00	29.50	3.03	3.03	5.65	Thistle Unit 51H (s)	84.20	90.37	14.66	
1500.00	1500.00	28.74	3.26	3.26	5.78	Thistle Unit 51H (s)	83.65	90.27	13.63	
1600.00	1600.00	27.85	3.48	3.48	5.92	Thistle Unit 51H (s)	83.06	90.14	12.74	
1700.00	1700.00	26.88	3.71	3.71	6.06	Thistle Unit 51H (s)	82.30	89.84	11.91	
1800.00	1800.00	25.89	3.93	3.93	6.20	Thistle Unit 51H (s)	81.76	89.77	11.21	
1900.00	1900.00	24.73	4.16	4.16	6.35	Thistle Unit 51H (s)	81.15	89.63	10.57	
2000.00	2000.00	23.43	4.38	4.38	6.50	Thistle Unit 51H (s)	80.38	89.34	9.98	
2100.00	2100.00	22.11	4.61	4.61	6.65	Thistle Unit 51H (s)	79.42	88.85	9.42	
2200.00	2200.00	20.77	4.83	4.83	6.81	Thistle Unit 51H (s)	78.47	88.38	8.92	
2300.00	2300.00	19.38	5.06	5.06	6.97	Thistle Unit 51H (s)	77.87	88.25	8.50	
2400.00	2400.00	18.05	5.28	5.28	7.14	Thistle Unit 51H (s)	77.44	88.32	8.12	
2500.00	2500.00	16.76	5.51	5.51	7.30	Thistle Unit 51H (s)	77.16	88.52	7.80	
2600.00	2600.00	15.47	5.73	5.73	7.47	Thistle Unit 51H (s)	77.11	88.93	7.52	

5D Anti-Collision Report

Primary Well: Thistle Unit 30H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
2700.00	2700.00	14.19	5.96	5.96	7.64	Thistle Unit 51H (s)	77.20	89.49	7.28	
2800.00	2800.00	12.90	6.18	6.18	7.81	Thistle Unit 51H (s)	77.27	90.05	7.05	
2900.00	2900.00	11.72	6.41	6.41	7.99	Thistle Unit 51H (s)	77.37	90.65	6.83	
3000.00	3000.00	10.59	6.63	6.63	8.17	Thistle Unit 51H (s)	77.31	91.08	6.62	
3100.00	3100.00	9.33	6.86	6.86	8.35	Thistle Unit 51H (s)	77.18	91.43	6.42	
3200.00	3200.00	8.09	7.08	7.08	8.53	Thistle Unit 51H (s)	77.22	91.94	6.24	
3300.00	3300.00	6.98	7.31	7.31	8.71	Thistle Unit 51H (s)	77.24	92.44	6.08	
3400.00	3400.00	6.08	7.53	7.53	8.90	Thistle Unit 51H (s)	77.16	92.83	5.92	
3500.00	3500.00	5.21	7.76	7.76	9.09	Thistle Unit 51H (s)	77.19	93.33	5.78	
3600.00	3600.00	4.32	7.98	7.98	9.28	Thistle Unit 51H (s)	77.26	93.90	5.64	
3700.00	3700.00	3.71	8.20	8.20	9.48	Thistle Unit 51H (s)	77.45	94.58	5.52	
3800.00	3800.00	3.26	8.43	8.43	9.67	Thistle Unit 51H (s)	77.77	95.38	5.42	
3900.00	3900.00	2.83	8.65	8.65	9.87	Thistle Unit 51H (s)	78.01	96.10	5.31	
4000.00	4000.00	2.32	8.88	8.88	10.08	Thistle Unit 51H (s)	78.03	96.60	5.20	
4100.00	4100.00	1.85	9.10	9.10	10.28	Thistle Unit 51H (s)	78.08	97.12	5.10	
4200.00	4200.00	1.53	9.33	9.33	10.49	Thistle Unit 51H (s)	78.10	97.62	5.00	
4300.00	4300.00	1.30	9.55	9.55	10.70	Thistle Unit 51H (s)	78.02	98.02	4.90	
4400.00	4400.00	1.25	9.78	9.78	10.91	Thistle Unit 51H (s)	77.97	98.37	4.82	
4500.00	4500.00	1.53	10.00	10.00	11.13	Thistle Unit 51H (s)	77.84	98.53	4.76	
4600.00	4600.00	1.85	10.23	10.23	11.35	Thistle Unit 51H (s)	77.62	98.56	4.71	
4700.00	4700.00	2.40	10.45	10.45	11.57	Thistle Unit 51H (s)	77.41	98.59	4.65	
4800.00	4800.00	3.36	10.68	10.68	11.80	Thistle Unit 51H (s)	76.99	98.43	4.59	
4900.00	4900.00	4.59	10.90	10.90	12.03	Thistle Unit 51H (s)	76.61	98.29	4.53	
5000.00	5000.00	5.96	11.13	11.13	12.26	Thistle Unit 51H (s)	76.39	98.35	4.48	
5100.00	5100.00	7.36	11.35	11.35	12.50	Thistle Unit 51H (s)	76.08	98.34	4.42	
5200.00	5200.00	8.77	11.58	11.58	12.74	Thistle Unit 51H (s)	76.01	98.56	4.37	
5300.00	5300.00	10.12	11.80	11.80	12.99	Thistle Unit 51H (s)	76.18	99.03	4.33	
5400.00	5400.00	11.50	12.03	12.03	13.24	Thistle Unit 51H (s)	76.29	99.43	4.30	
5500.00	5500.00	12.87	12.25	12.25	13.49	Thistle Unit 51H (s)	76.63	100.06	4.27	
5600.00	5600.00	14.07	12.48	12.48	13.74	Thistle Unit 51H (s)	77.05	100.78	4.25	
5700.00	5700.00	15.24	12.70	12.70	14.00	Thistle Unit 51H (s)	77.53	101.56	4.23	
5800.00	5800.00	16.47	12.93	12.93	14.27	Thistle Unit 51H (s)	78.31	102.68	4.21	
5900.00	5900.00	17.70	13.15	13.15	14.54	Thistle Unit 51H (s)	78.94	103.68	4.19	
6000.00	6000.00	18.85	13.37	13.37	14.81	Thistle Unit 51H (s)	79.39	104.48	4.16	
6100.00	6100.00	19.97	13.60	13.60	15.09	Thistle Unit 51H (s)	79.71	105.14	4.13	
6200.00	6200.00	21.15	13.82	13.82	15.37	Thistle Unit 51H (s)	80.02	105.78	4.11	

5D Anti-Collision Report

Primary Well: Thistle Unit 30H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T.Face to Sec (")	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
6300.00	6300.00	22.25	14.05	14.05	15.65	Thistle Unit 51H (s)	80.41	106.52	4.08	
6400.00	6400.00	23.40	14.27	14.27	15.94	Thistle Unit 51H (s)	80.80	107.25	4.05	
6500.00	6500.00	24.61	14.50	14.50	16.24	Thistle Unit 51H (s)	81.21	108.00	4.03	
6600.00	6600.00	25.77	14.72	14.72	16.54	Thistle Unit 51H (s)	81.76	108.90	4.01	
6700.00	6700.00	26.75	14.95	14.95	16.84	Thistle Unit 51H (s)	82.64	110.18	4.00	
6800.00	6800.00	27.62	15.17	15.17	17.15	Thistle Unit 51H (s)	83.55	111.47	3.99	
6900.00	6900.00	28.48	15.40	15.40	17.47	Thistle Unit 51H (s)	84.28	112.58	3.98	
7000.00	7000.00	29.10	15.62	15.62	17.79	Thistle Unit 51H (s)	85.10	113.78	3.97	
7100.00	7100.00	29.62	15.85	15.85	18.11	Thistle Unit 51H (s)	86.06	115.15	3.96	
7200.00	7200.00	30.25	16.07	16.07	18.44	Thistle Unit 51H (s)	87.05	116.56	3.95	
7300.00	7300.00	30.94	16.30	16.30	18.77	Thistle Unit 51H (s)	88.09	118.00	3.94	
7400.00	7400.00	31.77	16.52	16.52	19.11	Thistle Unit 51H (s)	88.86	119.17	3.93	
7500.00	7500.00	32.67	16.75	16.75	19.46	Thistle Unit 51H (s)	89.59	120.27	3.92	
7600.00	7600.00	33.61	16.97	16.97	19.81	Thistle Unit 51H (s)	90.45	121.50	3.91	
7700.00	7700.00	34.63	17.20	17.20	20.16	Thistle Unit 51H (s)	91.08	122.49	3.90	
7800.00	7800.00	35.69	17.42	17.42	20.52	Thistle Unit 51H (s)	91.44	123.25	3.88	
7900.00	7900.00	36.76	17.65	17.65	20.89	Thistle Unit 51H (s)	91.75	123.98	3.85	
8000.00	8000.00	37.82	17.87	17.87	21.26	Thistle Unit 51H (s)	92.16	124.81	3.82	
8100.00	8100.00	38.76	18.10	18.10	21.63	Thistle Unit 51H (s)	92.64	125.71	3.80	
8200.00	8200.00	39.57	18.32	18.32	22.01	Thistle Unit 51H (s)	93.02	126.50	3.78	
8300.00	8300.00	40.36	18.54	18.54	22.40	Thistle Unit 51H (s)	93.19	127.07	3.75	
8400.00	8400.00	41.19	18.77	18.77	22.79	Thistle Unit 51H (s)	93.21	127.50	3.72	
8500.00	8500.00	42.00	18.99	18.99	23.19	Thistle Unit 51H (s)	93.23	127.92	3.69	
8600.00	8600.00	42.83	19.22	19.22	23.60	Thistle Unit 51H (s)	93.39	128.48	3.66	
8700.00	8700.00	43.63	19.44	19.44	24.01	Thistle Unit 51H (s)	93.37	128.84	3.63	
8800.00	8800.00	44.41	19.67	19.67	24.42	Thistle Unit 51H (s)	93.12	128.98	3.60	
8900.00	8900.00	45.12	19.89	19.89	24.84	Thistle Unit 51H (s)	92.54	128.77	3.55	
9000.00	9000.00	45.75	20.12	20.12	25.27	Thistle Unit 51H (s)	91.73	128.37	3.50	
9100.00	9100.00	46.37	20.34	20.34	25.70	Thistle Unit 51H (s)	90.70	127.74	3.45	
9200.00	9199.54	225.04	20.53	20.36	26.13	Thistle Unit 51H (s)	94.91	132.30	3.54	
9300.00	9296.13	219.79	20.69	19.98	26.53	Thistle Unit 51H (s)	112.32	149.98	3.98	
9400.00	9386.11	214.31	20.86	19.07	26.87	Thistle Unit 51H (s)	146.93	184.92	4.87	
9500.00	9465.14	210.14	21.06	17.81	27.15	Thistle Unit 51H (s)	200.43	238.74	6.23	
9600.00	9529.76	208.71	21.34	16.39	27.38	Thistle Unit 51H (s)	270.35	308.93	8.01	
9700.00	9577.15	334.91	21.73	15.09	27.60	Exist Thistle Unit #2 (s)	1317.91	1488.76	8.71	
9800.00	9605.24	314.02	22.23	14.22	27.83	Exist Thistle Unit #2 (s)	1224.19	1394.98	8.17	

5D Anti-Collision Report

Primary Well: Thistle Unit 30H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T.Face to Sec (")	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
9900.00	9613.00	272.30	22.86	14.05	28.10	Exist Thistle Unit #2 (s)	1126.85	1297.52	7.60	
10000.00	9613.00	271.94	23.60	14.22	28.44	Exist Thistle Unit #2 (s)	1029.36	1199.86	7.04	
10100.00	9613.00	271.59	24.45	14.42	28.84	Exist Thistle Unit #2 (s)	931.83	1102.61	6.46	
10200.00	9613.00	271.25	25.41	14.66	29.32	Exist Thistle Unit #2 (s)	834.74	1005.90	5.88	
10300.00	9613.00	270.91	26.46	14.93	29.86	Exist Thistle Unit #2 (s)	738.41	909.89	5.31	
10400.00	9613.00	270.57	27.59	15.23	30.45	Exist Thistle Unit #2 (s)	643.17	814.85	4.75	
10500.00	9613.00	270.25	28.79	15.56	31.11	Exist Thistle Unit #2 (s)	549.27	721.14	4.20	
10600.00	9613.00	269.92	30.06	15.91	31.82	Exist Thistle Unit #2 (s)	456.70	629.38	3.64	
10700.00	9613.00	269.60	31.38	16.29	32.58	Exist Thistle Unit #2 (s)	366.67	540.53	3.11	
10800.00	9613.00	269.29	32.75	16.70	33.39	Exist Thistle Unit #2 (s)	280.81	456.32	2.60	
10900.00	9613.00	268.98	34.17	17.12	34.25	Exist Thistle Unit #2 (s)	201.87	379.85	2.13	
11000.00	9613.00	268.68	35.62	17.57	35.14	Exist Thistle Unit #2 (s)	134.85	316.75	1.74	SF(Lo)
11100.00	9613.00	268.38	37.10	18.03	36.07	Exist Thistle Unit #2 (s)	90.54	276.36	1.49	SF(Med)
11200.00	9613.00	268.08	38.62	18.52	37.04	Exist Thistle Unit #2 (s)	81.23	269.11	1.43	SF(Med)
11300.00	9613.00	267.79	40.16	19.02	38.03	Exist Thistle Unit #2 (s)	110.83	297.41	1.59	SF(Lo)
11400.00	9613.00	267.51	41.72	19.53	39.06	Exist Thistle Unit #2 (s)	169.17	352.83	1.92	SF(Lo)
11500.00	9613.00	267.23	43.31	20.06	40.11	Exist Thistle Unit #2 (s)	243.87	424.88	2.35	
11600.00	9613.00	266.95	44.91	20.60	41.19	Exist Thistle Unit #2 (s)	327.18	506.50	2.82	
11700.00	9613.00	266.69	46.53	21.15	42.30	Exist Thistle Unit #2 (s)	416.30	593.78	3.35	
11800.00	9613.00	266.42	48.17	21.71	43.42	Exist Thistle Unit #2 (s)	507.85	684.54	3.87	
11900.00	9613.00	266.16	49.82	22.28	44.57	Exist Thistle Unit #2 (s)	601.76	777.56	4.42	
12000.00	9613.00	265.90	51.48	22.86	45.73	Exist Thistle Unit #2 (s)	697.32	872.14	4.99	
12100.00	9613.00	265.65	53.15	23.45	46.91	Exist Thistle Unit #2 (s)	793.21	967.80	5.54	
12200.00	9613.00	265.41	54.83	24.05	48.10	Exist Thistle Unit #2 (s)	889.80	1064.26	6.10	
12300.00	9613.00	265.16	56.53	24.66	49.31	Exist Thistle Unit #2 (s)	987.05	1161.31	6.66	
12400.00	9613.00	264.92	58.23	25.27	50.54	Exist Thistle Unit #2 (s)	1084.79	1258.83	7.23	
12500.00	9613.00	264.69	59.93	25.89	51.78	Exist Thistle Unit #2 (s)	1182.91	1356.71	7.81	
12600.00	9613.00	264.46	61.65	26.51	53.02	Exist Thistle Unit #2 (s)	1281.32	1454.87	8.38	
12700.00	9613.00	264.23	63.37	27.14	54.28	Exist Thistle Unit #2 (s)	1379.95	1553.27	8.96	
12800.00	9613.00	264.01	65.10	27.78	55.55	Exist Thistle Unit #2 (s)	1478.77	1651.86	9.54	
12900.00	9613.00	263.79	66.83	28.42	56.83	Exist Thistle Unit #2 (s)	1577.68	1750.61	10.12	
13000.00	9613.00	263.57	68.57	29.06	58.12	Exist Thistle Unit #2 (s)	1676.71	1849.49	10.70	
13100.00	9613.00	263.36	70.31	29.71	59.42	Exist Thistle Unit #2 (s)	1775.78	1948.49	11.28	
13200.00	9613.00	263.15	72.05	30.36	60.72	Exist Thistle Unit #2 (s)	1874.82	2047.58	11.85	
13300.00	9613.00	262.96	73.80	31.02	62.03	Exist Thistle Unit #2 (s)	1973.95	2146.76	12.42	
13400.00	9613.00	262.77	75.56	31.67	63.35	Exist Thistle Unit #2 (s)	2073.16	2246.01	12.99	

5D Anti-Collision Report

Primary Well: Thistle Unit 30H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
13500.00	9613.00	262.58	77.32	32.34	64.67	Exist Thistle Unit #2 (s)	2172.44	2345.32	13.57	
13600.00	9613.00	262.40	79.08	33.00	66.00	Exist Thistle Unit #2 (s)	2271.78	2444.69	14.14	
13700.00	9613.00	262.22	80.84	33.67	67.34	Exist Thistle Unit #2 (s)	2371.17	2544.10	14.71	
13800.00	9613.00	208.09	82.61	34.34	68.68	Thistle Unit 70H (p)	1390.43	1491.87	14.71	
13900.00	9613.00	208.06	84.38	35.01	70.03	Thistle Unit 70H (p)	1386.64	1490.04	14.41	
14000.00	9613.00	208.02	86.15	35.69	71.38	Thistle Unit 70H (p)	1382.84	1488.21	14.12	
14100.00	9613.00	208.01	87.93	36.37	72.73	Thistle Unit 70H (p)	1380.77	1487.50	13.94	
14200.00	9613.00	208.01	89.70	37.05	74.09	Thistle Unit 70H (p)	1385.64	1492.91	13.92	
14300.00	9613.00	208.01	91.48	37.73	75.46	Thistle Unit 70H (p)	1397.48	1504.95	14.00	
14400.00	9613.00	208.01	93.26	38.41	76.83	Thistle Unit 70H (p)	1415.96	1523.48	14.17	
14500.00	9613.00	208.01	95.04	39.10	78.20	Thistle Unit 70H (p)	1441.03	1548.26	14.44	
14600.00	9613.00	208.01	96.83	39.79	79.57	Thistle Unit 70H (p)	1472.44	1578.99	14.82	
14700.00	9613.00	208.01	98.61	40.47	80.95	Thistle Unit 70H (p)	1509.81	1615.34	15.31	
14800.00	9613.00	208.01	100.40	41.17	82.33	Thistle Unit 70H (p)	1552.71	1656.93	15.90	
14900.00	9613.00	208.01	102.19	41.86	83.71	Thistle Unit 70H (p)	1600.50	1703.39	16.56	
15000.00	9613.00	208.01	103.98	42.55	85.10	Thistle Unit 70H (p)	1652.90	1754.32	17.30	
15100.00	9613.00	208.01	105.77	43.25	86.49	Thistle Unit 70H (p)	1709.53	1809.35	18.13	
15200.00	9613.00	208.01	107.57	43.94	87.88	Thistle Unit 70H (p)	1769.85	1868.12	19.01	
15300.00	9613.00	208.01	109.36	44.64	89.28	Thistle Unit 70H (p)	1833.61	1930.28	19.97	
15400.00	9613.00	208.01	111.16	45.34	90.67	Thistle Unit 70H (p)	1900.49	1995.52	21.00	
15500.00	9613.00	208.01	112.95	46.04	92.07	Thistle Unit 70H (p)	1970.08	2063.54	22.08	
15600.00	9613.00	208.01	114.75	46.74	93.47	Thistle Unit 70H (p)	2042.07	2134.08	23.19	
15700.00	9613.00	208.01	116.55	47.44	94.88	Thistle Unit 70H (p)	2116.34	2206.90	24.37	
15800.00	9613.00	208.01	118.35	48.14	96.28	Thistle Unit 70H (p)	2192.66	2281.78	25.60	
15900.00	9613.00	208.01	120.15	48.84	97.69	Thistle Unit 70H (p)	2270.81	2358.52	26.89	
16000.00	9613.00	258.91	121.95	49.55	99.10	Exist Thistle Unit #2 (s)	4663.64	4837.30	27.86	
16100.00	9613.00	258.79	123.75	50.25	100.51	Exist Thistle Unit #2 (s)	4763.44	4937.14	28.42	
16200.00	9613.00	258.67	125.56	50.96	101.92	Exist Thistle Unit #2 (s)	4863.24	5037.00	28.99	
16300.00	9613.00	258.56	127.36	51.67	103.33	Exist Thistle Unit #2 (s)	4963.04	5136.85	29.55	
16400.00	9613.00	258.45	129.17	52.37	104.75	Exist Thistle Unit #2 (s)	5062.86	5236.72	30.12	
16500.00	9613.00	258.34	130.97	53.08	106.16	Exist Thistle Unit #2 (s)	5162.67	5336.58	30.69	
16600.00	9613.00	258.23	132.78	53.79	107.58	Exist Thistle Unit #2 (s)	5262.49	5436.46	31.25	
16700.00	9613.00	258.13	134.58	54.50	109.00	Exist Thistle Unit #2 (s)	5362.32	5536.34	31.81	
16800.00	9613.00	258.02	136.39	55.21	110.42	Exist Thistle Unit #2 (s)	5462.14	5636.22	32.38	
16900.00	9613.00	257.94	138.20	55.92	111.84	Exist Thistle Unit #2 (s)	5561.97	5736.10	32.94	
17000.00	9613.00	257.85	140.01	56.63	113.26	Exist Thistle Unit #2 (s)	5661.81	5835.99	33.50	

5D Anti-Collision Report

Primary Well: Thistle Unit 30H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
MD (US ft)	TVD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	Nearest Well	ES (US ft)	CC (US ft)	SF	Risk
17100.00	9613.00	257.77	141.82	57.34	114.68	Exist Thistle Unit #2 (s)	5761.64	5935.89	34.07	
17200.00	9613.00	257.68	143.63	58.05	116.11	Exist Thistle Unit #2 (s)	5861.48	6035.78	34.63	
17300.00	9613.00	257.60	145.44	58.77	117.53	Exist Thistle Unit #2 (s)	5961.32	6135.68	35.19	
17400.00	9613.00	257.52	147.25	59.48	118.96	Exist Thistle Unit #2 (s)	6061.17	6235.59	35.75	
17500.00	9613.00	257.44	149.06	60.19	120.39	Exist Thistle Unit #2 (s)	6161.02	6335.49	36.31	
17600.00	9613.00	257.37	150.87	60.91	121.82	Exist Thistle Unit #2 (s)	6260.86	6435.40	36.87	
17700.00	9613.00	257.29	152.68	61.62	123.25	Exist Thistle Unit #2 (s)	6360.72	6535.31	37.43	
17800.00	9613.00	257.22	154.49	62.34	124.68	Exist Thistle Unit #2 (s)	6460.57	6635.23	37.99	
17900.00	9613.00	257.14	156.31	63.05	126.11	Exist Thistle Unit #2 (s)	6560.42	6735.15	38.55	
18000.00	9613.00	257.07	158.12	63.77	127.54	Exist Thistle Unit #2 (s)	6660.28	6835.06	39.11	
18100.00	9613.00	257.00	159.93	64.49	128.97	Exist Thistle Unit #2 (s)	6760.14	6934.99	39.66	
18200.00	9613.00	256.93	161.75	65.20	130.41	Exist Thistle Unit #2 (s)	6860.00	7034.91	40.22	
18300.00	9613.00	256.86	163.56	65.92	131.84	Exist Thistle Unit #2 (s)	6959.86	7134.84	40.78	
18400.00	9613.00	256.79	165.37	66.64	133.27	Exist Thistle Unit #2 (s)	7059.72	7234.76	41.33	
18500.00	9613.00	256.73	167.19	67.36	134.71	Exist Thistle Unit #2 (s)	7159.58	7334.69	41.89	
18600.00	9613.00	256.66	169.00	68.07	136.15	Exist Thistle Unit #2 (s)	7259.45	7434.63	42.44	
18700.00	9613.00	256.60	170.82	68.79	137.58	Exist Thistle Unit #2 (s)	7359.31	7534.56	42.99	
18800.00	9613.00	256.53	172.64	69.51	139.02	Exist Thistle Unit #2 (s)	7459.18	7634.49	43.55	
18900.00	9613.00	256.47	174.45	70.23	140.46	Exist Thistle Unit #2 (s)	7559.05	7734.43	44.10	
19000.00	9613.00	256.41	176.27	70.95	141.90	Exist Thistle Unit #2 (s)	7658.91	7834.37	44.65	
19100.00	9613.00	256.35	178.08	71.67	143.34	Exist Thistle Unit #2 (s)	7758.78	7934.31	45.20	
19200.00	9613.00	256.29	179.90	72.39	144.78	Exist Thistle Unit #2 (s)	7858.65	8034.25	45.75	
19300.00	9613.00	256.23	181.72	73.11	146.22	Exist Thistle Unit #2 (s)	7958.53	8134.19	46.30	
19357.10	9613.00	256.20	182.76	73.52	147.04	Exist Thistle Unit #2 (s)	8015.55	8191.26	46.62	

Secondary Well: Thistle Unit 51H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
0.00	-0.01	1.99	31.76	0.00	0.00	0.06	91.60	92.22	148.42	
100.00	99.64	101.64	31.78	0.14	0.14	2.63	91.56	92.43	107.11	
200.00	200.11	202.11	31.91	0.34	0.34	2.63	91.26	92.55	71.67	
300.00	300.00	302.01	32.15	0.56	0.56	2.63	90.76	92.49	53.20	
400.00	400.02	402.02	32.41	0.82	0.82	2.64	90.26	92.48	41.66	
500.00	500.08	502.09	32.76	1.08	1.08	2.64	89.72	92.42	34.24	
600.00	600.11	602.11	32.86	1.21	1.21	2.65	89.27	92.32	30.22	
700.00	700.27	702.28	32.68	1.27	1.27	2.66	88.77	92.11	27.54	
800.00	800.08	802.09	32.47	1.38	1.38	2.67	88.24	91.92	24.97	
900.00	900.09	902.10	32.22	1.51	1.51	2.68	87.79	91.83	22.74	
1000.00	1000.26	1002.27	31.81	1.68	1.68	2.69	87.21	91.64	20.70	
1100.00	1100.44	1102.45	31.28	1.87	1.87	2.70	86.41	91.26	18.83	
1200.00	1200.43	1202.45	30.74	2.08	2.08	2.71	85.50	90.78	17.20	
1300.00	1300.10	1302.12	30.16	2.30	2.30	2.72	84.77	90.49	15.82	
1400.00	1400.12	1402.15	29.50	2.52	2.52	2.73	84.20	90.37	14.66	
1500.00	1500.06	1502.10	28.74	2.75	2.75	2.74	83.65	90.27	13.63	

5D Anti-Collision Report

Secondary Well: Thistle Unit 51H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
1600.00	1600.18	1602.22	27.85	2.99	2.99	2.76	83.06	90.14	12.74	
1700.00	1700.34	1702.39	26.88	3.23	3.23	2.77	82.30	89.84	11.91	
1800.00	1799.81	1801.88	25.89	3.47	3.47	2.78	81.76	89.77	11.21	
1900.00	1900.42	1902.51	24.73	3.72	3.72	2.79	81.15	89.63	10.57	
2000.00	2000.12	2002.22	23.43	3.97	3.97	2.81	80.38	89.34	9.98	
2100.00	2100.71	2102.84	22.11	4.22	4.22	2.82	79.42	88.85	9.42	
2200.00	2200.14	2202.30	20.77	4.47	4.47	2.83	78.47	88.38	8.92	
2300.00	2300.07	2302.25	19.38	4.73	4.73	2.85	77.87	88.25	8.50	
2400.00	2399.83	2402.02	18.05	4.99	4.98	2.86	77.44	88.32	8.12	
2500.00	2499.81	2502.03	16.76	5.24	5.24	2.88	77.16	88.52	7.80	
2600.00	2599.46	2601.70	15.47	5.49	5.49	2.89	77.11	88.93	7.52	
2700.00	2699.54	2701.80	14.19	5.75	5.74	2.91	77.20	89.49	7.28	
2800.00	2799.45	2801.73	12.90	6.01	6.00	2.92	77.27	90.05	7.05	
2900.00	2899.48	2901.78	11.72	6.26	6.26	2.94	77.37	90.65	6.83	
3000.00	2999.73	3002.05	10.59	6.52	6.51	2.96	77.31	91.08	6.62	
3100.00	3099.63	3101.97	9.33	6.78	6.77	2.98	77.18	91.43	6.42	
3200.00	3199.43	3201.79	8.09	7.04	7.03	2.99	77.22	91.94	6.24	
3300.00	3299.66	3302.03	6.98	7.30	7.30	3.01	77.24	92.44	6.08	
3400.00	3399.62	3402.01	6.08	7.56	7.56	3.03	77.16	92.83	5.92	
3500.00	3499.44	3501.84	5.21	7.83	7.82	3.05	77.19	93.33	5.78	
3600.00	3599.48	3601.90	4.32	8.09	8.08	3.08	77.26	93.90	5.64	
3700.00	3699.23	3701.65	3.71	8.34	8.33	3.10	77.45	94.58	5.52	
3800.00	3799.26	3801.69	3.26	8.58	8.57	3.12	77.77	95.38	5.42	
3900.00	3899.37	3901.80	2.83	8.83	8.82	3.15	78.01	96.10	5.31	
4000.00	3999.66	4002.09	2.32	9.08	9.07	3.18	78.03	96.60	5.20	
4100.00	4099.33	4101.77	1.85	9.34	9.33	3.20	78.08	97.12	5.10	
4200.00	4199.68	4202.13	1.53	9.59	9.58	3.23	78.10	97.62	5.00	
4300.00	4299.56	4302.00	1.30	9.84	9.83	3.27	78.02	98.02	4.90	
4400.00	4399.76	4402.20	1.25	10.02	10.01	3.30	77.97	98.37	4.82	
4500.00	4499.92	4502.36	1.53	10.09	10.08	3.34	77.84	98.53	4.76	
4600.00	4600.03	4602.48	1.85	10.11	10.10	3.37	77.62	98.56	4.71	
4700.00	4699.92	4702.37	2.40	10.14	10.13	3.41	77.41	98.59	4.65	
4800.00	4800.38	4802.85	3.36	10.17	10.16	3.45	76.99	98.43	4.59	
4900.00	4899.90	4902.39	4.59	10.21	10.19	3.50	76.61	98.29	4.53	
5000.00	4999.98	5002.50	5.96	10.25	10.24	3.55	76.39	98.35	4.48	
5100.00	5100.03	5102.57	7.36	10.30	10.29	3.60	76.08	98.34	4.42	
5200.00	5199.54	5202.12	8.77	10.36	10.35	3.65	76.01	98.56	4.37	
5300.00	5299.54	5302.14	10.12	10.43	10.42	3.70	76.18	99.03	4.33	
5400.00	5399.64	5402.28	11.50	10.51	10.50	3.76	76.29	99.43	4.30	
5500.00	5499.12	5501.78	12.87	10.59	10.58	3.82	76.63	100.06	4.27	
5600.00	5599.43	5602.12	14.07	10.68	10.68	3.89	77.05	100.78	4.25	
5700.00	5698.99	5701.71	15.24	10.78	10.77	3.95	77.53	101.56	4.23	
5800.00	5798.72	5801.47	16.47	10.89	10.88	4.02	78.31	102.68	4.21	
5900.00	5899.22	5901.99	17.70	11.00	11.00	4.09	78.94	103.68	4.19	
6000.00	5999.13	6001.93	18.85	11.11	11.11	4.17	79.39	104.48	4.16	
6100.00	6099.47	6102.29	19.97	11.23	11.22	4.25	79.71	105.14	4.13	
6200.00	6199.19	6202.04	21.15	11.35	11.34	4.33	80.02	105.78	4.11	
6300.00	6299.23	6302.11	22.25	11.47	11.46	4.42	80.41	106.52	4.08	
6400.00	6399.21	6402.11	23.40	11.60	11.59	4.51	80.80	107.25	4.05	
6500.00	6499.17	6502.09	24.61	11.73	11.72	4.60	81.21	108.00	4.03	
6600.00	6598.86	6601.81	25.77	11.86	11.86	4.70	81.76	108.90	4.01	
6700.00	6698.35	6701.33	26.75	12.01	12.01	4.79	82.64	110.18	4.00	
6800.00	6798.78	6801.79	27.62	12.17	12.16	4.90	83.55	111.47	3.99	
6900.00	6898.73	6901.76	28.48	12.32	12.32	5.00	84.28	112.58	3.98	
7000.00	6998.54	7001.58	29.10	12.49	12.49	5.11	85.10	113.78	3.97	
7100.00	7098.32	7101.38	29.62	12.67	12.66	5.22	86.06	115.15	3.96	
7200.00	7198.42	7201.49	30.25	12.84	12.84	5.34	87.05	116.56	3.95	
7300.00	7298.21	7301.30	30.94	13.02	13.01	5.46	88.09	118.00	3.94	

5D Anti-Collision Report

Secondary Well: Thistle Unit 51H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
7400.00	7398.99	7402.11	31.77	13.19	13.19	5.58	88.86	119.17	3.93	
7500.00	7498.38	7501.51	32.67	13.36	13.35	5.71	89.59	120.27	3.92	
7600.00	7598.65	7601.81	33.61	13.53	13.53	5.84	90.45	121.50	3.91	
7700.00	7698.93	7702.12	34.63	13.70	13.70	5.97	91.08	122.49	3.90	
7800.00	7799.21	7802.43	35.69	13.87	13.86	6.11	91.44	123.25	3.88	
7900.00	7898.98	7902.23	36.76	14.04	14.03	6.24	91.75	123.98	3.85	
8000.00	7998.95	8002.23	37.82	14.21	14.20	6.39	92.16	124.81	3.82	
8100.00	8098.81	8102.11	38.76	14.39	14.38	6.53	92.64	125.71	3.80	
8200.00	8199.20	8202.53	39.57	14.57	14.56	6.68	93.02	126.50	3.78	
8300.00	8299.34	8302.68	40.36	14.74	14.74	6.83	93.19	127.07	3.75	
8400.00	8399.57	8402.93	41.19	14.92	14.91	6.99	93.21	127.50	3.72	
8500.00	8499.35	8502.73	42.00	15.10	15.09	7.15	93.23	127.92	3.69	
8600.00	8599.24	8602.64	42.83	15.28	15.27	7.31	93.39	128.48	3.66	
8700.00	8699.80	8703.21	43.63	15.46	15.45	7.47	93.37	128.84	3.63	
8800.00	8799.87	8803.30	44.41	15.64	15.63	7.64	93.12	128.98	3.60	
8900.00	8900.62	8904.06	45.12	15.81	15.80	7.81	92.54	128.77	3.55	
9000.00	9000.44	9003.89	45.75	15.97	15.96	7.99	91.73	128.37	3.50	
9100.00	9101.19	9104.65	46.37	16.14	16.13	8.17	90.70	127.74	3.45	
9200.00	9201.38	9204.86	225.04	16.29	16.28	8.35	94.91	132.30	3.54	
9300.00	9298.18	9301.67	219.79	16.44	16.43	8.53	112.32	149.98	3.98	
9400.00	9387.20	9390.70	214.31	16.59	16.58	8.69	146.93	184.92	4.87	
9500.00	9468.73	9472.24	210.14	16.73	16.72	8.85	200.43	238.74	6.23	
9600.00	9536.04	9539.56	208.71	16.84	16.83	8.97	270.35	308.93	8.01	
9700.00	9586.06	9589.60	211.53	16.92	16.92	9.07	353.80	392.49	10.14	
9800.00	9616.34	9619.89	224.30	16.97	16.97	9.13	446.50	485.35	12.49	
9900.00	9626.33	9629.88	261.94	16.99	16.98	9.15	544.17	583.11	14.98	
10000.00	9628.68	9632.23	260.54	17.00	16.99	9.15	643.01	681.96	17.51	
10100.00	9631.02	9634.58	259.16	17.00	16.99	9.16	742.15	781.10	20.06	
10200.00	9633.35	9636.91	257.80	17.00	17.00	9.16	841.49	880.42	22.61	
10300.00	9635.67	9639.22	256.47	17.01	17.00	9.17	940.95	979.88	25.17	
10400.00	9637.97	9641.53	255.15	17.01	17.00	9.17	1040.51	1079.43	27.73	
10500.00	9640.26	9643.82	253.86	17.02	17.01	9.18	1140.13	1179.06	30.29	
10600.00	9642.54	9646.10	252.59	17.02	17.01	9.18	1239.81	1278.74	32.85	
10700.00	9644.81	9648.37	251.35	17.02	17.02	9.19	1339.54	1378.46	35.42	
10800.00	9647.06	9650.62	250.13	17.03	17.02	9.19	1439.29	1478.21	37.98	
10900.00	11176.22	12397.55	183.25	30.05	20.28	40.71	1529.29	1567.27	41.27	
11000.00	11181.18	12512.17	183.11	31.50	20.73	41.58	1532.53	1571.45	40.37	
11100.00	11184.71	12638.68	182.97	33.14	21.26	42.59	1534.18	1574.08	39.45	
11200.00	11186.73	12729.45	182.87	34.34	21.63	43.35	1535.44	1576.16	38.71	
11300.00	11189.23	12840.53	182.74	35.83	22.13	44.31	1536.52	1578.26	37.81	
11400.00	11190.85	12954.08	182.60	37.39	22.65	45.34	1536.70	1579.53	36.88	
11500.00	11191.53	13065.71	182.46	38.94	23.18	46.38	1536.09	1579.99	35.99	
11600.00	11191.69	13164.56	182.32	40.32	23.66	47.33	1535.15	1579.99	35.23	
11700.00	11192.28	13258.43	182.17	41.66	24.11	48.25	1534.59	1580.44	34.47	
11800.00	11192.97	13357.18	182.12	43.05	24.61	49.25	1534.17	1581.08	33.70	
11900.00	11193.75	13448.44	182.09	44.35	25.07	50.19	1534.01	1581.92	33.02	
12000.00	11195.22	13530.65	182.03	45.53	25.48	51.05	1534.78	1583.65	32.41	
12100.00	11197.87	13619.68	181.99	46.81	25.95	52.00	1536.62	1586.56	31.77	
12200.00	11200.85	13730.85	181.96	48.43	26.57	53.22	1538.09	1589.21	31.09	
12300.00	11203.07	13838.11	181.96	50.00	27.17	54.40	1539.01	1591.29	30.44	
12400.00	11204.13	13976.75	182.00	52.05	27.99	55.96	1538.42	1592.12	29.65	
12500.00	11203.32	14075.68	182.04	53.53	28.55	57.09	1536.44	1591.35	28.98	
12600.00	11203.66	14144.03	182.05	54.55	28.91	57.88	1536.02	1591.85	28.51	
12700.00	11204.93	14263.65	182.00	56.34	29.63	59.28	1535.65	1592.90	27.82	
12800.00	11204.28	14394.93	181.91	58.32	30.44	60.83	1533.63	1592.39	27.10	
12900.00	11201.18	14518.20	181.78	60.19	31.19	62.30	1529.56	1589.74	26.41	
13000.00	11199.67	14585.64	181.69	61.19	31.57	63.11	1526.28	1587.46	25.95	
13100.00	11199.82	14655.69	181.56	62.23	31.97	63.97	1525.27	1587.46	25.53	

5D Anti-Collision Report

Secondary Well: Thistle Unit 51H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	E5 (US ft)	CC (US ft)	SF	Risk
13200.00	11201.04	14739.52	181.40	63.49	32.46	65.00	1525.46	1588.78	25.09	
13300.00	11203.22	14833.46	181.25	64.92	33.04	66.16	1526.44	1590.98	24.65	
13400.00	11204.93	14944.00	181.12	66.61	33.74	67.54	1526.49	1592.42	24.15	
13500.00	11201.18	15190.94	181.10	70.36	35.37	70.63	1524.87	1593.17	23.33	
13600.00	11196.66	15258.72	181.09	71.39	35.80	71.48	1517.09	1586.50	22.86	
13700.00	11193.44	15327.66	181.09	72.44	36.22	72.36	1511.32	1581.82	22.44	
13800.00	11191.37	15402.94	181.08	73.59	36.69	73.32	1507.39	1579.02	22.04	
13900.00	11189.61	15496.16	181.06	75.01	37.28	74.51	1504.21	1577.11	21.64	
14000.00	11188.09	15591.41	181.01	76.47	37.89	75.74	1501.31	1575.49	21.24	
14100.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1500.03	1575.04	21.00	
14200.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1505.08	1580.30	21.01	
14300.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1516.41	1591.84	21.10	
14400.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1534.00	1609.52	21.31	
14500.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1557.81	1633.14	21.68	
14600.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1587.55	1662.45	22.20	
14700.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1622.91	1697.16	22.86	
14800.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1663.34	1736.93	23.60	
14900.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1708.44	1781.44	24.40	
15000.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1758.07	1830.34	25.33	
15100.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1811.86	1883.27	26.37	
15200.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1869.44	1939.93	27.52	
15300.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1930.44	1999.98	28.76	
15400.00	11187.46	15636.00	180.98	77.15	38.18	76.32	1994.46	2063.13	30.04	
15500.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2061.28	2129.11	31.39	
15600.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2130.62	2197.66	32.78	
15700.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2202.31	2268.55	34.25	
15800.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2276.13	2341.56	35.79	
15900.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2351.86	2416.51	37.38	
16000.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2429.24	2493.21	38.97	
16100.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2508.22	2571.52	40.62	
16200.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2588.64	2651.28	42.33	
16300.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2670.39	2732.38	44.08	
16400.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2753.34	2814.69	45.88	
16500.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2837.32	2898.12	47.67	
16600.00	11187.46	15636.00	180.98	77.15	38.18	76.32	2922.28	2982.56	49.48	
16700.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3008.09	3067.94	51.25	
16800.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3094.73	3154.18	53.05	
16900.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3182.15	3241.21	54.88	
17000.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3270.29	3328.97	56.73	
17100.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3359.10	3417.40	58.61	
17200.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3448.51	3506.46	60.51	
17300.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3538.49	3596.09	62.43	
17400.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3628.99	3686.25	64.37	
17500.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3719.97	3776.91	66.33	
17600.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3811.39	3868.03	68.29	
17700.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3903.18	3959.58	70.21	
17800.00	11187.46	15636.00	180.98	77.15	38.18	76.32	3995.36	4051.52	72.14	
17900.00	11187.46	15636.00	180.98	77.15	38.18	76.32	4087.90	4143.84	74.08	
18000.00	11187.46	15636.00	180.98	77.15	38.18	76.32	4180.76	4236.51	75.98	
18100.00	11187.46	15636.00	180.98	77.15	38.18	76.32	4273.91	4329.51	77.88	
18200.00	11187.46	15636.00	180.98	77.15	38.18	76.32	4367.37	4422.81	79.78	
18300.00	11187.46	15636.00	180.98	77.15	38.18	76.32	4461.10	4516.39	81.68	
18400.00	11187.46	15636.00	180.98	77.15	38.18	76.32	4555.10	4610.25	83.60	
18500.00	11187.46	15636.00	180.98	77.15	38.18	76.32	4649.35	4704.36	85.51	
18600.00	11187.46	15636.00	180.98	77.15	38.18	76.32	4743.82	4798.71	87.43	
18700.00	11187.46	15636.00	180.98	77.15	38.18	76.32	4838.52	4893.28	89.35	
18800.00	11187.46	15636.00	180.98	77.15	38.18	76.32	4933.42	4988.07	91.28	
18900.00	11187.46	15636.00	180.98	77.15	38.18	76.32	5028.52	5083.05	93.21	

5D Anti-Collision Report

Secondary Well: Thistle Unit 51H (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
19000.00	11187.46	15636.00	180.98	77.15	38.18	76.32	5123.80	5178.22	95.15	
19100.00	11187.46	15636.00	180.98	77.15	38.18	76.32	5219.24	5273.57	97.05	
19200.00	11187.46	15636.00	180.98	77.15	38.18	76.32	5314.82	5369.10	98.93	
19300.00	11187.46	15636.00	180.98	77.15	38.18	76.32	5410.56	5464.78	100.80	
19357.10	11187.46	15636.00	180.98	77.15	38.18	76.32	5465.30	5519.48	101.87	

Secondary Well: Exist Thistle Unit #2 (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
0.00	0.00	5.00	170.23	0.08	0.08	0.16	1721.47	1723.08	1069.41	
100.00	100.00	105.00	170.23	1.59	1.59	3.23	1719.84	1723.08	532.04	
200.00	200.00	205.00	170.23	3.95	3.95	4.62	1717.26	1723.08	296.25	
300.00	300.00	305.00	170.23	6.98	6.98	4.65	1714.00	1723.08	189.81	
400.00	400.00	405.00	170.23	10.02	10.02	4.70	1710.74	1723.08	139.64	
500.00	500.00	505.00	170.23	13.06	13.06	4.76	1707.48	1723.08	110.45	
600.00	600.00	605.00	170.23	16.10	16.10	4.82	1704.22	1723.08	91.35	
700.00	700.00	705.00	170.23	19.13	19.13	4.90	1700.96	1723.08	77.88	
800.00	800.00	805.00	170.23	22.17	22.17	4.99	1697.69	1723.08	67.87	
900.00	900.00	905.00	170.23	25.21	25.21	5.08	1694.43	1723.08	60.15	
1000.00	1000.00	1005.00	170.23	28.24	28.24	5.18	1691.17	1723.08	54.00	
1100.00	1100.00	1105.00	170.23	31.28	31.28	5.29	1687.91	1723.08	48.99	
1200.00	1200.00	1205.00	170.23	34.32	34.32	5.41	1684.65	1723.08	44.83	
1300.00	1300.00	1305.00	170.23	37.35	37.35	5.53	1681.39	1723.08	41.33	
1400.00	1400.00	1405.00	170.23	40.39	40.39	5.66	1678.12	1723.08	38.33	
1500.00	1500.00	1505.00	170.23	43.43	43.43	5.79	1674.86	1723.08	35.74	
1600.00	1600.00	1605.00	170.23	46.46	46.46	5.92	1671.60	1723.08	33.47	
1700.00	1700.00	1705.00	170.23	49.50	49.50	6.07	1668.34	1723.08	31.48	
1800.00	1800.00	1805.00	170.23	52.54	52.54	6.21	1665.08	1723.08	29.71	
1900.00	1900.00	1905.00	170.23	55.57	55.57	6.36	1661.82	1723.08	28.13	
2000.00	2000.00	2005.00	170.23	58.61	58.61	6.51	1658.55	1723.08	26.70	
2100.00	2100.00	2105.00	170.23	61.65	61.65	6.66	1655.29	1723.08	25.42	
2200.00	2200.00	2205.00	170.23	64.69	64.69	6.82	1652.03	1723.08	24.25	
2300.00	2300.00	2305.00	170.23	67.72	67.72	6.98	1648.77	1723.08	23.19	
2400.00	2400.00	2405.00	170.23	70.76	70.76	7.14	1645.51	1723.08	22.21	
2500.00	2500.00	2505.00	170.23	73.80	73.80	7.31	1642.25	1723.08	21.32	
2600.00	2600.00	2605.00	170.23	76.83	76.83	7.48	1638.99	1723.08	20.49	
2700.00	2700.00	2705.00	170.23	79.87	79.87	7.65	1635.72	1723.08	19.72	
2800.00	2800.00	2805.00	170.23	82.91	82.91	7.82	1632.46	1723.08	19.01	
2900.00	2900.00	2905.00	170.23	85.94	85.94	8.00	1629.20	1723.08	18.35	
3000.00	3000.00	3005.00	170.23	88.98	88.98	8.17	1625.94	1723.08	17.74	
3100.00	3100.00	3105.00	170.23	92.02	92.02	8.36	1622.68	1723.08	17.16	
3200.00	3200.00	3205.00	170.23	95.05	95.05	8.54	1619.42	1723.08	16.62	
3300.00	3300.00	3305.00	170.23	98.09	98.09	8.72	1616.15	1723.08	16.11	
3400.00	3400.00	3405.00	170.23	101.13	101.13	8.91	1612.89	1723.08	15.64	
3500.00	3500.00	3505.00	170.23	104.16	104.16	9.10	1609.63	1723.08	15.19	
3600.00	3600.00	3605.00	170.23	107.20	107.20	9.29	1606.37	1723.08	14.76	
3700.00	3700.00	3705.00	170.23	110.24	110.24	9.49	1603.11	1723.08	14.36	
3800.00	3800.00	3805.00	170.23	113.28	113.28	9.68	1599.85	1723.08	13.98	
3900.00	3900.00	3905.00	170.23	116.31	116.31	9.88	1596.58	1723.08	13.62	
4000.00	4000.00	4005.00	170.23	119.35	119.35	10.09	1593.32	1723.08	13.28	
4100.00	4100.00	4105.00	170.23	122.39	122.39	10.29	1590.06	1723.08	12.95	
4200.00	4200.00	4205.00	170.23	125.42	125.42	10.50	1586.80	1723.08	12.64	
4300.00	4300.00	4305.00	170.23	128.46	128.46	10.71	1583.54	1723.08	12.35	
4400.00	4400.00	4405.00	170.23	131.50	131.50	10.92	1580.28	1723.08	12.07	
4500.00	4500.00	4505.00	170.23	134.53	134.53	11.14	1577.01	1723.08	11.80	
4600.00	4600.00	4605.00	170.23	137.57	137.57	11.36	1573.75	1723.08	11.54	
4700.00	4700.00	4705.00	170.23	140.61	140.61	11.58	1570.49	1723.08	11.29	
4800.00	4800.00	4805.00	170.23	143.64	143.64	11.81	1567.23	1723.08	11.06	
4900.00	4900.00	4905.00	170.23	146.07	146.07	9.63	1564.57	1723.08	10.87	

5D Anti-Collision Report

Secondary Well: Exist Thistle Unit #2 (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Ph MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
5000.00	5000.00	5005.00	170.23	147.59	147.59	3.83	1562.83	1723.08	10.75	
5100.00	5074.44	5079.44	170.23	147.67	147.65	3.57	1563.40	1723.78	10.75	
5200.00	5170.41	5175.43	170.21	147.67	147.65	3.62	1565.14	1725.57	10.76	
5300.00	5270.96	5276.00	170.20	147.67	147.65	3.67	1566.28	1727.24	10.73	
5400.00	5373.59	5378.64	170.20	147.67	147.65	3.73	1567.79	1728.87	10.73	
5500.00	5472.96	5478.02	170.19	147.67	147.65	3.79	1568.96	1730.39	10.72	
5600.00	5575.45	5580.53	170.19	147.67	147.66	3.86	1570.36	1731.90	10.72	
5700.00	5674.43	5679.51	170.19	147.68	147.66	3.92	1571.74	1733.32	10.73	
5800.00	5773.73	5778.83	170.20	147.68	147.66	3.99	1573.23	1734.83	10.74	
5900.00	5873.40	5878.51	170.20	147.68	147.67	4.06	1574.44	1736.35	10.72	
6000.00	5973.40	5978.52	170.20	147.69	147.67	4.14	1575.61	1737.88	10.71	
6100.00	6076.34	6081.47	170.21	147.69	147.68	4.22	1576.68	1739.35	10.69	
6200.00	6175.73	6180.87	170.22	147.70	147.68	4.30	1577.70	1740.70	10.68	
6300.00	6275.76	6280.91	170.22	147.70	147.69	4.38	1578.84	1742.10	10.67	
6400.00	6376.00	6381.16	170.23	147.71	147.69	4.47	1579.99	1743.49	10.66	
6500.00	6476.35	6481.51	170.24	147.72	147.70	4.56	1581.14	1744.85	10.66	
6600.00	6576.05	6581.22	170.25	147.72	147.71	4.66	1582.31	1746.21	10.65	
6700.00	6675.04	6680.23	170.26	147.73	147.71	4.76	1583.52	1747.61	10.65	
6800.00	6774.67	6779.87	170.26	147.74	147.72	4.86	1584.79	1749.05	10.65	
6900.00	6874.66	6879.87	170.27	147.75	147.73	4.96	1586.08	1750.50	10.65	
7000.00	6975.66	6980.88	170.29	147.75	147.74	5.07	1587.38	1751.93	10.65	
7100.00	7078.37	7083.60	170.31	147.76	147.75	5.19	1588.64	1753.24	10.65	
7200.00	7181.54	7186.78	170.33	147.77	147.76	5.30	1589.39	1754.39	10.63	
7300.00	7278.60	7283.84	170.35	147.78	147.77	5.42	1590.09	1755.50	10.61	
7400.00	7379.63	7384.89	170.38	147.79	147.78	5.54	1590.94	1756.71	10.60	
7500.00	7478.50	7483.77	170.40	147.80	147.79	5.67	1591.83	1757.89	10.59	
7600.00	7579.33	7584.61	170.43	147.81	147.80	5.80	1592.80	1759.10	10.58	
7700.00	7679.35	7684.64	170.46	147.83	147.81	5.93	1593.77	1760.27	10.57	
7800.00	7780.09	7785.39	170.48	147.84	147.83	6.06	1594.73	1761.43	10.57	
7900.00	7877.50	7882.81	170.49	147.85	147.83	6.20	1595.72	1762.62	10.56	
8000.00	7978.78	7984.09	170.52	147.86	147.85	6.34	1596.82	1763.88	10.56	
8100.00	8083.84	8089.17	170.54	147.88	147.87	6.49	1597.77	1764.95	10.56	
8200.00	8182.23	8187.56	170.57	147.89	147.88	6.64	1598.63	1765.89	10.56	
8300.00	8283.25	8288.59	170.60	147.90	147.89	6.79	1599.39	1766.88	10.55	
8400.00	8382.46	8387.81	170.62	147.92	147.91	6.95	1599.98	1767.84	10.53	
8500.00	8482.16	8487.52	170.65	147.93	147.92	7.10	1600.65	1768.85	10.52	
8600.00	8580.84	8586.21	170.67	147.95	147.94	7.26	1601.37	1769.89	10.50	
8700.00	8677.09	8682.47	170.70	147.97	147.95	7.42	1602.27	1771.07	10.49	
8800.00	8776.45	8781.84	170.72	147.98	147.96	7.59	1603.32	1772.40	10.48	
8900.00	8868.01	8873.41	170.74	148.00	147.97	7.74	1604.61	1773.92	10.48	
9000.00	8964.20	8969.61	170.75	148.02	147.98	7.91	1606.36	1775.88	10.48	
9100.00	9064.43	9069.87	170.76	148.03	148.00	8.09	1608.17	1777.90	10.47	
9200.00	9162.81	9168.27	351.05	148.05	148.02	8.26	1601.89	1771.80	10.43	
9300.00	9260.48	9265.97	350.56	148.07	148.04	8.44	1578.65	1748.75	10.28	
9400.00	9360.81	9366.32	349.36	148.09	148.07	8.63	1537.45	1707.74	10.03	
9500.00	9442.90	9448.42	347.18	148.11	148.08	8.78	1478.06	1648.60	9.67	
9600.00	9506.36	9511.90	343.18	148.12	148.07	8.90	1403.78	1574.54	9.22	
9700.00	9557.56	9563.11	334.91	148.13	148.06	9.00	1317.91	1488.76	8.71	
9800.00	9591.68	9597.26	314.02	148.13	148.05	9.07	1224.19	1394.98	8.17	
9900.00	9602.26	9607.83	272.30	148.14	148.05	9.09	1126.85	1297.52	7.60	
10000.00	9603.92	9609.50	271.94	148.14	148.05	9.09	1029.36	1199.86	7.04	
10100.00	9605.56	9611.14	271.59	148.14	148.05	9.09	931.83	1102.61	6.46	
10200.00	9607.17	9612.75	271.25	148.14	148.05	9.10	834.74	1005.90	5.88	
10300.00	9608.76	9614.34	270.91	148.14	148.05	9.10	738.41	909.89	5.31	
10400.00	9610.32	9615.90	270.57	148.14	148.05	9.10	643.17	814.85	4.75	
10500.00	9611.85	9617.44	270.25	148.14	148.05	9.11	549.27	721.14	4.20	
10600.00	9613.36	9618.95	269.92	148.14	148.05	9.11	456.70	629.38	3.64	
10700.00	9614.85	9620.44	269.60	148.14	148.05	9.11	366.67	540.53	3.11	

5D Anti-Collision Report

Secondary Well: Exist Thistle Unit #2 (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
10800.00	9616.31	9621.90	269.29	148.14	148.05	9.12	280.81	456.32	2.60	
10900.00	9617.76	9623.34	268.98	148.14	148.05	9.12	201.87	379.85	2.13	
11000.00	9619.18	9624.77	268.68	148.14	148.05	9.12	134.85	316.75	1.74	SF(Lo)
11100.00	9620.58	9626.17	268.38	148.14	148.05	9.12	90.54	276.36	1.49	SF(Med)
11200.00	9621.95	9627.54	268.08	148.14	148.05	9.13	81.23	269.11	1.43	SF(Med)
11300.00	9623.30	9628.89	267.79	148.14	148.05	9.13	110.83	297.41	1.59	SF(Lo)
11400.00	9624.63	9630.22	267.51	148.14	148.05	9.13	169.17	352.83	1.92	SF(Lo)
11500.00	9625.93	9631.52	267.23	148.14	148.05	9.13	243.87	424.88	2.35	
11600.00	9627.21	9632.80	266.95	148.14	148.05	9.14	327.18	506.50	2.82	
11700.00	9628.47	9634.06	266.69	148.14	148.05	9.14	416.30	593.78	3.35	
11800.00	9629.70	9635.30	266.42	148.14	148.05	9.14	507.85	684.54	3.87	
11900.00	9630.92	9636.51	266.16	148.14	148.05	9.14	601.76	777.56	4.42	
12000.00	9632.11	9637.71	265.90	148.14	148.05	9.15	697.32	872.14	4.99	
12100.00	9633.29	9638.89	265.65	148.14	148.05	9.15	793.21	967.80	5.54	
12200.00	9634.45	9640.04	265.41	148.14	148.05	9.15	889.80	1064.26	6.10	
12300.00	9635.58	9641.18	265.16	148.14	148.05	9.15	987.05	1161.31	6.66	
12400.00	9636.70	9642.30	264.92	148.14	148.05	9.16	1084.79	1258.83	7.23	
12500.00	9637.80	9643.40	264.69	148.14	148.05	9.16	1182.91	1356.71	7.81	
12600.00	9638.88	9644.48	264.46	148.14	148.05	9.16	1281.32	1454.87	8.38	
12700.00	9639.95	9645.55	264.23	148.14	148.05	9.16	1379.95	1553.27	8.96	
12800.00	9641.00	9646.60	264.01	148.14	148.05	9.16	1478.77	1651.86	9.54	
12900.00	9642.03	9647.63	263.79	148.14	148.05	9.17	1577.68	1750.61	10.12	
13000.00	9643.05	9648.65	263.57	148.14	148.05	9.17	1676.71	1849.49	10.70	
13100.00	9644.05	9649.65	263.36	148.14	148.05	9.17	1775.78	1948.49	11.28	
13200.00	9645.00	9650.60	263.15	148.14	148.05	9.17	1874.82	2047.58	11.85	
13300.00	9645.91	9651.51	262.96	148.14	148.05	9.17	1973.95	2146.76	12.42	
13400.00	9646.80	9652.40	262.77	148.14	148.05	9.18	2073.16	2246.01	12.99	
13500.00	9647.67	9653.28	262.58	148.14	148.05	9.18	2172.44	2345.32	13.57	
13600.00	9648.53	9654.14	262.40	148.14	148.05	9.18	2271.78	2444.69	14.14	
13700.00	9649.38	9654.98	262.22	148.14	148.05	9.18	2371.17	2544.10	14.71	
13800.00	9650.20	9655.81	262.05	148.14	148.05	9.18	2470.60	2643.57	15.28	
13900.00	9651.01	9656.62	261.88	148.14	148.05	9.18	2570.08	2743.07	15.86	
14000.00	9651.81	9657.42	261.71	148.14	148.05	9.19	2669.59	2842.60	16.43	
14100.00	9652.59	9658.20	261.54	148.14	148.05	9.19	2769.13	2942.17	17.00	
14200.00	9653.36	9658.97	261.38	148.14	148.05	9.19	2868.70	3041.76	17.58	
14300.00	9654.11	9659.72	261.22	148.14	148.05	9.19	2968.30	3141.38	18.15	
14400.00	9654.85	9660.46	261.06	148.14	148.05	9.19	3067.92	3241.02	18.72	
14500.00	9655.58	9661.19	260.91	148.14	148.05	9.19	3167.56	3340.69	19.30	
14600.00	9656.29	9661.90	260.76	148.14	148.05	9.19	3267.22	3440.37	19.87	
14700.00	9656.99	9662.61	260.61	148.14	148.05	9.20	3366.89	3540.07	20.44	
14800.00	9657.68	9663.30	260.47	148.14	148.05	9.20	3466.58	3639.79	21.01	
14900.00	9658.36	9663.98	260.32	148.14	148.05	9.20	3566.29	3739.52	21.59	
15000.00	9659.03	9664.64	260.18	148.14	148.05	9.20	3666.01	3839.27	22.16	
15100.00	9659.68	9665.30	260.05	148.14	148.05	9.20	3765.74	3939.03	22.73	
15200.00	9660.33	9665.94	259.91	148.14	148.05	9.20	3865.48	4038.80	23.30	
15300.00	9660.96	9666.58	259.78	148.14	148.05	9.20	3965.23	4138.58	23.87	
15400.00	9661.59	9667.20	259.65	148.14	148.05	9.20	4064.99	4238.37	24.45	
15500.00	9662.20	9667.82	259.52	148.14	148.05	9.21	4164.75	4338.17	25.02	
15600.00	9662.80	9668.42	259.39	148.14	148.05	9.21	4264.51	4437.98	25.58	
15700.00	9663.40	9669.01	259.27	148.14	148.05	9.21	4364.29	4537.80	26.15	
15800.00	9663.98	9669.60	259.14	148.14	148.05	9.21	4464.06	4637.62	26.72	
15900.00	9664.56	9670.17	259.02	148.14	148.05	9.21	4563.85	4737.46	27.29	
16000.00	9665.12	9670.74	258.91	148.14	148.05	9.21	4663.64	4837.30	27.86	
16100.00	9665.68	9671.30	258.79	148.14	148.05	9.21	4763.44	4937.14	28.42	
16200.00	9666.23	9671.85	258.67	148.14	148.05	9.21	4863.24	5037.00	28.99	
16300.00	9666.77	9672.39	258.56	148.14	148.05	9.21	4963.04	5136.85	29.55	
16400.00	9667.30	9672.92	258.45	148.14	148.05	9.22	5062.86	5236.72	30.12	
16500.00	9667.83	9673.45	258.34	148.15	148.05	9.22	5162.67	5336.58	30.69	

5D Anti-Collision Report

Secondary Well: Exist Thistle Unit #2 (s)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
16600.00	9668.34	9673.96	258.23	148.15	148.05	9.22	5262.49	5436.46	31.25	
16700.00	9668.85	9674.47	258.13	148.15	148.05	9.22	5362.32	5536.34	31.81	
16800.00	9669.35	9674.97	258.02	148.15	148.05	9.22	5462.14	5636.22	32.38	
16900.00	9669.78	9675.40	257.94	148.15	148.05	9.22	5561.97	5736.10	32.94	
17000.00	9670.19	9675.81	257.85	148.15	148.05	9.22	5661.81	5835.99	33.50	
17100.00	9670.60	9676.22	257.77	148.15	148.05	9.22	5761.64	5935.89	34.07	
17200.00	9670.99	9676.61	257.68	148.15	148.05	9.22	5861.48	6035.78	34.63	
17300.00	9671.39	9677.01	257.60	148.15	148.05	9.22	5961.32	6135.68	35.19	
17400.00	9671.77	9677.39	257.52	148.15	148.05	9.22	6061.17	6235.59	35.75	
17500.00	9672.15	9677.77	257.44	148.15	148.05	9.23	6161.02	6335.49	36.31	
17600.00	9672.52	9678.14	257.37	148.15	148.05	9.23	6260.86	6435.40	36.87	
17700.00	9672.89	9678.51	257.29	148.15	148.05	9.23	6360.72	6535.31	37.43	
17800.00	9673.25	9678.87	257.22	148.15	148.05	9.23	6460.57	6635.23	37.99	
17900.00	9673.60	9679.22	257.14	148.15	148.05	9.23	6560.42	6735.15	38.55	
18000.00	9673.95	9679.57	257.07	148.15	148.05	9.23	6660.28	6835.06	39.11	
18100.00	9674.29	9679.92	257.00	148.15	148.05	9.23	6760.14	6934.99	39.66	
18200.00	9674.63	9680.25	256.93	148.15	148.05	9.23	6860.00	7034.91	40.22	
18300.00	9674.96	9680.59	256.86	148.15	148.05	9.23	6959.86	7134.84	40.78	
18400.00	9675.29	9680.91	256.79	148.15	148.05	9.23	7059.72	7234.76	41.33	
18500.00	9675.61	9681.23	256.73	148.15	148.05	9.23	7159.58	7334.69	41.89	
18600.00	9675.93	9681.55	256.66	148.15	148.05	9.23	7259.45	7434.63	42.44	
18700.00	9676.24	9681.86	256.60	148.15	148.05	9.23	7359.31	7534.56	42.99	
18800.00	9676.55	9682.17	256.53	148.15	148.05	9.23	7459.18	7634.49	43.55	
18900.00	9676.85	9682.47	256.47	148.15	148.05	9.23	7559.05	7734.43	44.10	
19000.00	9677.15	9682.77	256.41	148.15	148.05	9.23	7658.91	7834.37	44.65	
19100.00	9677.44	9683.07	256.35	148.15	148.05	9.24	7758.78	7934.31	45.20	
19200.00	9677.73	9683.36	256.29	148.15	148.05	9.24	7858.65	8034.25	45.75	
19300.00	9678.02	9683.64	256.23	148.15	148.05	9.24	7958.53	8134.19	46.30	
19357.10	9678.18	9683.80	256.20	148.15	148.05	9.24	8015.55	8191.26	46.62	

Secondary Well: Thistle Unit 70H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
0.00	0.00	4.00	78.77	0.01	0.01	0.19	548.19	548.76	960.95	
100.00	100.00	104.00	78.77	0.12	0.12	4.60	547.97	548.76	689.21	
200.00	200.00	204.00	78.77	0.35	0.35	4.62	547.52	548.76	440.53	
300.00	300.00	304.00	78.77	0.57	0.57	4.65	547.07	548.76	323.72	
400.00	400.00	404.00	78.77	0.80	0.80	4.70	546.62	548.76	255.88	
500.00	500.00	504.00	78.77	1.02	1.02	4.76	546.17	548.76	211.54	
600.00	600.00	604.00	78.77	1.25	1.25	4.82	545.72	548.76	180.30	
700.00	700.00	704.00	78.77	1.47	1.47	4.90	545.27	548.76	157.10	
800.00	800.00	804.00	78.77	1.69	1.69	4.98	544.82	548.76	139.19	
900.00	900.00	904.00	78.77	1.92	1.92	5.08	544.37	548.76	124.95	
1000.00	1000.00	1004.00	78.77	2.14	2.14	5.18	543.92	548.76	113.35	
1100.00	1100.00	1104.00	78.77	2.37	2.37	5.29	543.47	548.76	103.72	
1200.00	1200.00	1204.00	78.77	2.59	2.59	5.41	543.02	548.76	95.60	
1300.00	1300.00	1304.00	78.77	2.82	2.82	5.53	542.57	548.76	88.66	
1400.00	1400.00	1404.00	78.77	3.04	3.04	5.65	542.12	548.76	82.65	
1500.00	1500.00	1504.00	78.77	3.27	3.27	5.79	541.67	548.76	77.41	
1600.00	1600.00	1604.00	78.77	3.49	3.49	5.92	541.22	548.76	72.80	
1700.00	1700.00	1704.00	78.77	3.72	3.72	6.06	540.77	548.76	68.70	
1800.00	1800.00	1804.00	78.77	3.94	3.94	6.21	540.32	548.76	65.04	
1900.00	1900.00	1904.00	78.77	4.17	4.17	6.36	539.88	548.76	61.75	
2000.00	2000.00	2004.00	78.77	4.39	4.39	6.51	539.43	548.76	58.78	
2100.00	2100.00	2104.00	78.77	4.62	4.62	6.66	538.98	548.76	56.08	
2200.00	2200.00	2204.00	78.77	4.84	4.84	6.82	538.53	548.76	53.62	
2300.00	2300.00	2304.00	78.77	5.07	5.07	6.98	538.08	548.76	51.36	
2400.00	2400.00	2404.00	78.77	5.29	5.29	7.14	537.63	548.76	49.29	
2500.00	2500.00	2504.00	78.77	5.52	5.52	7.31	537.18	548.76	47.37	

5D Anti-Collision Report

Secondary Well: Thistle Unit 70H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pri MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
2600.00	2600.00	2604.00	78.77	5.74	5.74	7.48	536.73	548.76	45.60	
2700.00	2700.00	2704.00	78.77	5.97	5.97	7.65	536.28	548.76	43.96	
2800.00	2800.00	2804.00	78.77	6.19	6.19	7.82	535.83	548.76	42.43	
2900.00	2900.00	2904.00	78.77	6.42	6.42	8.00	535.38	548.76	41.01	
3000.00	3000.00	3004.00	78.77	6.64	6.64	8.17	534.93	548.76	39.68	
3100.00	3100.00	3104.00	78.77	6.86	6.86	8.35	534.48	548.76	38.43	
3200.00	3200.00	3204.00	78.77	7.09	7.09	8.54	534.03	548.76	37.26	
3300.00	3300.00	3304.00	78.77	7.31	7.31	8.72	533.58	548.76	36.15	
3400.00	3400.00	3404.00	78.77	7.54	7.54	8.91	533.13	548.76	35.11	
3500.00	3500.00	3504.00	78.77	7.76	7.76	9.10	532.68	548.76	34.13	
3600.00	3600.00	3604.00	78.77	7.99	7.99	9.29	532.23	548.76	33.20	
3700.00	3700.00	3704.00	78.77	8.21	8.21	9.48	531.78	548.76	32.32	
3800.00	3800.00	3804.00	78.77	8.44	8.44	9.68	531.34	548.76	31.49	
3900.00	3900.00	3904.00	78.77	8.66	8.66	9.88	530.89	548.76	30.70	
4000.00	4000.00	4004.00	78.77	8.89	8.89	10.08	530.44	548.76	29.95	
4100.00	4100.00	4104.00	78.77	9.11	9.11	10.29	529.99	548.76	29.23	
4200.00	4200.00	4204.00	78.77	9.34	9.34	10.50	529.54	548.76	28.54	
4300.00	4300.00	4304.00	78.77	9.56	9.56	10.71	529.09	548.76	27.89	
4400.00	4400.00	4404.00	78.77	9.79	9.79	10.92	528.64	548.76	27.27	
4500.00	4500.00	4504.00	78.77	10.01	10.01	11.14	528.19	548.76	26.67	
4600.00	4600.00	4604.00	78.77	10.24	10.24	11.36	527.74	548.76	26.10	
4700.00	4700.00	4704.00	78.77	10.46	10.46	11.58	527.29	548.76	25.56	
4800.00	4800.00	4804.00	78.77	10.69	10.69	11.81	526.84	548.76	25.03	
4900.00	4900.00	4904.00	78.77	10.91	10.91	12.04	526.39	548.76	24.53	
5000.00	5000.00	5004.00	78.77	11.14	11.14	12.27	525.94	548.76	24.05	
5100.00	5100.00	5104.00	78.77	11.36	11.36	12.51	525.49	548.76	23.58	
5200.00	5200.00	5204.00	78.77	11.59	11.59	12.75	525.04	548.76	23.14	
5300.00	5300.00	5304.00	78.77	11.81	11.81	13.00	524.59	548.76	22.71	
5400.00	5400.00	5404.00	78.77	12.04	12.04	13.24	524.14	548.76	22.29	
5500.00	5500.00	5504.00	78.77	12.26	12.26	13.50	523.69	548.76	21.89	
5600.00	5600.00	5604.00	78.77	12.48	12.48	13.75	523.24	548.76	21.51	
5700.00	5700.00	5704.00	78.77	12.71	12.71	14.01	522.80	548.76	21.13	
5800.00	5800.00	5804.00	78.77	12.93	12.93	14.28	522.35	548.76	20.77	
5900.00	5900.00	5904.00	78.77	13.16	13.16	14.55	521.90	548.76	20.43	
6000.00	6000.00	6004.00	78.77	13.38	13.38	14.82	521.45	548.76	20.09	
6100.00	6100.00	6104.00	78.77	13.61	13.61	15.10	521.00	548.76	19.76	
6200.00	6200.00	6204.00	78.77	13.83	13.83	15.38	520.55	548.76	19.45	
6300.00	6300.00	6304.00	78.77	14.06	14.06	15.66	520.10	548.76	19.15	
6400.00	6400.00	6404.00	78.77	14.28	14.28	15.95	519.65	548.76	18.85	
6500.00	6500.00	6504.00	78.77	14.51	14.51	16.25	519.20	548.76	18.56	
6600.00	6600.00	6604.00	78.77	14.73	14.73	16.55	518.75	548.76	18.28	
6700.00	6700.00	6704.00	78.77	14.96	14.96	16.85	518.30	548.76	18.02	
6800.00	6800.00	6804.00	78.77	15.18	15.18	17.16	517.85	548.76	17.75	
6900.00	6900.00	6904.00	78.77	15.41	15.41	17.48	517.40	548.76	17.50	
7000.00	7000.00	7004.00	78.77	15.63	15.63	17.80	516.95	548.76	17.25	
7100.00	7100.00	7104.00	78.77	15.86	15.86	18.12	516.50	548.76	17.01	
7200.00	7200.00	7204.00	78.77	16.08	16.08	18.45	516.05	548.76	16.78	
7300.00	7300.00	7304.00	78.77	16.31	16.31	18.78	515.60	548.76	16.55	
7400.00	7400.00	7404.00	78.77	16.53	16.53	19.12	515.15	548.76	16.33	
7500.00	7500.00	7504.00	78.77	16.76	16.76	19.47	514.70	548.76	16.11	
7600.00	7600.00	7604.00	78.77	16.98	16.98	19.82	514.26	548.76	15.90	
7700.00	7700.00	7704.00	78.77	17.21	17.21	20.17	513.81	548.76	15.70	
7800.00	7800.00	7804.00	78.77	17.43	17.43	20.53	513.36	548.76	15.50	
7900.00	7900.00	7904.00	78.77	17.65	17.65	20.90	512.91	548.76	15.31	
8000.00	8000.00	8004.00	78.77	17.88	17.88	21.27	512.46	548.76	15.12	
8100.00	8100.00	8104.00	78.77	18.10	18.10	21.64	512.01	548.76	14.93	
8200.00	8200.00	8204.00	78.77	18.33	18.33	22.02	511.56	548.76	14.75	
8300.00	8300.00	8304.00	78.77	18.55	18.55	22.41	511.11	548.76	14.57	

5D Anti-Collision Report

Secondary Well: Thistle Unit 70H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
8400.00	8400.00	8404.00	78.77	18.78	18.78	22.80	510.66	548.76	14.40	
8500.00	8500.00	8504.00	78.77	19.00	19.00	23.20	510.21	548.76	14.23	
8600.00	8600.00	8604.00	78.77	19.23	19.23	23.61	509.76	548.76	14.07	
8700.00	8700.00	8704.00	78.77	19.45	19.45	24.02	509.31	548.76	13.91	
8800.00	8800.00	8804.00	78.77	19.68	19.68	24.43	508.86	548.76	13.75	
8900.00	8900.00	8904.00	78.77	19.90	19.90	24.85	508.41	548.76	13.60	
9000.00	9000.00	9004.00	78.77	20.13	20.13	25.28	507.96	548.76	13.45	
9100.00	9100.00	9104.00	78.77	20.35	20.35	25.71	507.51	548.76	13.30	
9200.00	9199.54	9203.54	258.50	20.58	20.58	26.15	508.77	550.36	13.23	
9300.00	9296.13	9300.13	256.58	20.79	20.79	26.57	514.07	556.04	13.25	
9400.00	9386.11	9390.11	254.15	21.00	21.00	26.98	525.86	568.20	13.42	
9500.00	9465.14	9469.14	252.09	21.17	21.17	27.34	547.61	590.34	13.82	
9600.00	9529.76	9533.76	251.65	21.32	21.32	27.63	582.07	625.23	14.48	
9700.00	9577.15	9581.15	254.07	21.42	21.42	27.85	630.56	674.02	15.51	
9800.00	9605.24	9609.24	260.53	21.49	21.49	27.98	691.73	735.52	16.79	
9900.00	9613.00	9617.00	270.00	21.51	21.51	28.02	762.54	806.55	18.32	
10000.00	9613.00	9617.00	270.00	21.51	21.51	28.02	839.25	883.47	19.98	
10100.00	9613.00	9617.00	270.00	21.51	21.51	28.02	920.30	964.63	21.76	
10200.00	9613.00	9617.00	270.00	21.51	21.51	28.02	1004.61	1049.05	23.61	
10300.00	9613.00	9617.00	270.00	21.51	21.51	28.02	1091.43	1136.00	25.49	
10400.00	9613.00	9617.00	270.00	21.51	21.51	28.02	1180.30	1224.95	27.44	
10500.00	9613.00	9617.00	270.00	21.51	21.51	28.02	1270.73	1315.48	29.40	
10600.00	9613.00	9617.00	270.00	21.51	21.51	28.02	1362.44	1407.30	31.37	
10700.00	9613.00	9617.00	270.00	21.51	21.51	28.02	1455.23	1500.16	33.39	
10800.00	10964.49	12337.77	209.10	36.76	20.32	40.61	1499.91	1546.98	32.87	
10900.00	10963.31	12437.74	209.07	38.13	20.72	41.41	1496.60	1545.14	31.83	
11000.00	10962.12	12537.72	209.03	39.54	21.13	42.25	1493.24	1543.29	30.83	
11100.00	10960.93	12637.70	209.00	40.99	21.57	43.11	1489.85	1541.45	29.88	
11200.00	10959.74	12737.68	208.97	42.46	22.02	44.01	1486.41	1539.61	28.94	
11300.00	10958.56	12837.66	208.94	43.96	22.48	44.94	1482.90	1537.76	28.03	
11400.00	10957.37	12937.64	208.90	45.48	22.96	45.90	1479.36	1535.92	27.16	
11500.00	10956.18	13037.62	208.87	47.02	23.46	46.89	1475.87	1534.08	26.35	
11600.00	10954.99	13137.60	208.84	48.59	23.96	47.89	1472.34	1532.24	25.58	
11700.00	10953.81	13237.58	208.80	50.17	24.48	48.93	1468.79	1530.40	24.84	
11800.00	10952.62	13337.56	208.77	51.76	25.00	49.98	1465.18	1528.56	24.12	
11900.00	10951.43	13437.54	208.74	53.38	25.54	51.05	1461.50	1526.72	23.41	
12000.00	10950.25	13537.52	208.71	55.00	26.09	52.15	1457.86	1524.88	22.75	
12100.00	10949.06	13637.49	208.67	56.64	26.64	53.26	1454.22	1523.04	22.13	
12200.00	10947.87	13737.47	208.64	58.29	27.21	54.39	1450.52	1521.20	21.52	
12300.00	10946.68	13837.45	208.61	59.94	27.78	55.53	1446.85	1519.37	20.95	
12400.00	10945.50	13937.43	208.57	61.61	28.36	56.69	1443.19	1517.53	20.41	
12500.00	10944.31	14037.41	208.54	63.29	28.95	57.86	1439.47	1515.69	19.89	
12600.00	10943.12	14137.39	208.50	64.97	29.54	59.05	1435.72	1513.86	19.37	
12700.00	10941.94	14237.37	208.47	66.66	30.14	60.24	1431.96	1512.02	18.89	
12800.00	10940.75	14337.35	208.44	68.36	30.74	61.45	1428.20	1510.19	18.42	
12900.00	10939.56	14437.33	208.40	70.07	31.35	62.68	1424.44	1508.35	17.97	
13000.00	10938.37	14537.31	208.37	71.78	31.97	63.91	1420.67	1506.52	17.55	
13100.00	10937.19	14637.29	208.33	73.49	32.59	65.15	1416.90	1504.69	17.14	
13200.00	10936.00	14737.27	208.30	75.21	33.22	66.40	1413.13	1502.85	16.75	
13300.00	10934.81	14837.24	208.27	76.94	33.85	67.66	1409.35	1501.02	16.37	
13400.00	10933.62	14937.22	208.23	78.67	34.48	68.92	1405.57	1499.19	16.01	
13500.00	10932.44	15037.20	208.20	80.40	35.12	70.20	1401.79	1497.36	15.67	
13600.00	10931.25	15137.18	208.16	82.14	35.76	71.48	1398.01	1495.53	15.34	
13700.00	10930.06	15237.16	208.13	83.88	36.40	72.77	1394.22	1493.70	15.02	
13800.00	10928.88	15337.14	208.09	85.63	37.05	74.06	1390.43	1491.87	14.71	
13900.00	10927.69	15437.12	208.06	87.38	37.70	75.37	1386.64	1490.04	14.41	
14000.00	10926.50	15537.10	208.02	89.13	38.36	76.67	1382.84	1488.21	14.12	
14100.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1380.77	1487.50	13.94	

5D Anti-Collision Report

Secondary Well: Thistle Unit 70H (p)(TVD relative to Kelly Bushing)(All Azimuth Relative to GRID NORTH)										
Pr MD (US ft)	TVD (US ft)	Sec MD (US ft)	T.Face to Sec (°)	S.Major (US ft)	S.Minor (US ft)	TVD Spread (US ft)	ES (US ft)	CC (US ft)	SF	Risk
14200.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1385.64	1492.91	13.92	
14300.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1397.48	1504.95	14.00	
14400.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1415.96	1523.48	14.17	
14500.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1441.03	1548.26	14.44	
14600.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1472.44	1578.99	14.82	
14700.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1509.81	1615.34	15.31	
14800.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1552.71	1656.93	15.90	
14900.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1600.50	1703.39	16.56	
15000.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1652.90	1754.32	17.30	
15100.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1709.53	1809.35	18.13	
15200.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1769.85	1868.12	19.01	
15300.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1833.61	1930.28	19.97	
15400.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1900.49	1995.52	21.00	
15500.00	10926.00	15579.35	208.01	89.87	38.63	77.23	1970.08	2063.54	22.08	
15600.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2042.07	2134.08	23.19	
15700.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2116.34	2206.90	24.37	
15800.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2192.66	2281.78	25.60	
15900.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2270.81	2358.52	26.89	
16000.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2350.62	2436.95	28.23	
16100.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2431.92	2516.91	29.61	
16200.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2514.53	2598.26	31.03	
16300.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2598.16	2680.87	32.41	
16400.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2682.91	2764.63	33.83	
16500.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2768.68	2849.44	35.28	
16600.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2855.37	2935.20	36.77	
16700.00	10926.00	15579.35	208.01	89.87	38.63	77.23	2942.91	3021.84	38.28	
16800.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3031.21	3109.28	39.83	
16900.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3120.22	3197.46	41.40	
17000.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3209.88	3286.31	43.00	
17100.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3300.13	3375.79	44.62	
17200.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3390.90	3465.84	46.25	
17300.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3482.11	3556.43	47.86	
17400.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3573.80	3647.50	49.49	
17500.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3665.91	3739.04	51.13	
17600.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3758.43	3830.99	52.79	
17700.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3851.32	3923.34	54.47	
17800.00	10926.00	15579.35	208.01	89.87	38.63	77.23	3944.51	4016.06	56.13	
17900.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4038.00	4109.11	57.78	
18000.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4131.80	4202.49	59.45	
18100.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4225.89	4296.17	61.13	
18200.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4320.23	4390.12	62.82	
18300.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4414.83	4484.34	64.52	
18400.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4509.65	4578.80	66.22	
18500.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4604.69	4673.49	67.94	
18600.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4699.93	4768.39	69.65	
18700.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4795.32	4863.51	71.33	
18800.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4890.89	4958.81	73.01	
18900.00	10926.00	15579.35	208.01	89.87	38.63	77.23	4986.63	5054.30	74.69	
19000.00	10926.00	15579.35	208.01	89.87	38.63	77.23	5082.52	5149.95	76.38	
19100.00	10926.00	15579.35	208.01	89.87	38.63	77.23	5178.57	5245.77	78.06	
19200.00	10926.00	15579.35	208.01	89.87	38.63	77.23	5274.77	5341.75	79.75	
19300.00	10926.00	15579.35	208.01	89.87	38.63	77.23	5371.10	5437.86	81.45	
19357.10	10926.00	15579.35	208.01	89.87	38.63	77.23	5426.16	5492.81	82.42	

**Weatherford**

Weatherford Drilling Services

GeoDec4 v2.1.0.0

Report Date: October 15, 2015
Job Number: _____
Customer: Devon Energy
Well Name: Thistle Unit 30H
API Number: _____
Rig Name: _____
Location: Lea Co, NM Nad83 NME
Block: _____
Engineer: _____

NAD83 / New Mexico East (ftUS)	NAD83 (1986)
Projected Coordinate System	Geodetic Coordinate System
Datum: North American Datum 1983 (1986)	Datum: North American Datum 1983 (1986)
Ellipsoid: GRS 1980	Ellipsoid: GRS 1980
EPSG: 2257	EPSG: 4269
North: 467200.70 US Survey Foot	Latitude: 32.282189 Degree
East: 772731.45 US Survey Foot	Longitude: -103.584579 Degree
Convergence: 0.40°	
Declination: 7.22°	
Total Correction: 6.82°	
Datum Transformation: none	

Geodetic Location WGS84

MSL Elevation = 0 m
Latitude = 32° 16' 55.88" N
Longitude = 103° 35' 04.49" W

Magnetic Declination = 7.22 deg	[True North Offset]
Local Gravity = .9988 g	Checksum = 6630
Local Field Strength = 48233 nT	Magnetic Vector X = 23789 nT
Magnetic Dip = 60.19 deg	Magnetic Vector Y = 3015 nT
Magnetic Model = bggm2015.dat	Magnetic Vector Z = 41849 nT
Run Date = November 30, 2015	Magnetic Vector H = 23980 nT

Signed: _____ Date: _____