# EXTRACTION OIL & GAS

**Broomfield County**
**Sec 10-T1S-R68W**
**INTERCHANGE A S16-20-19C**

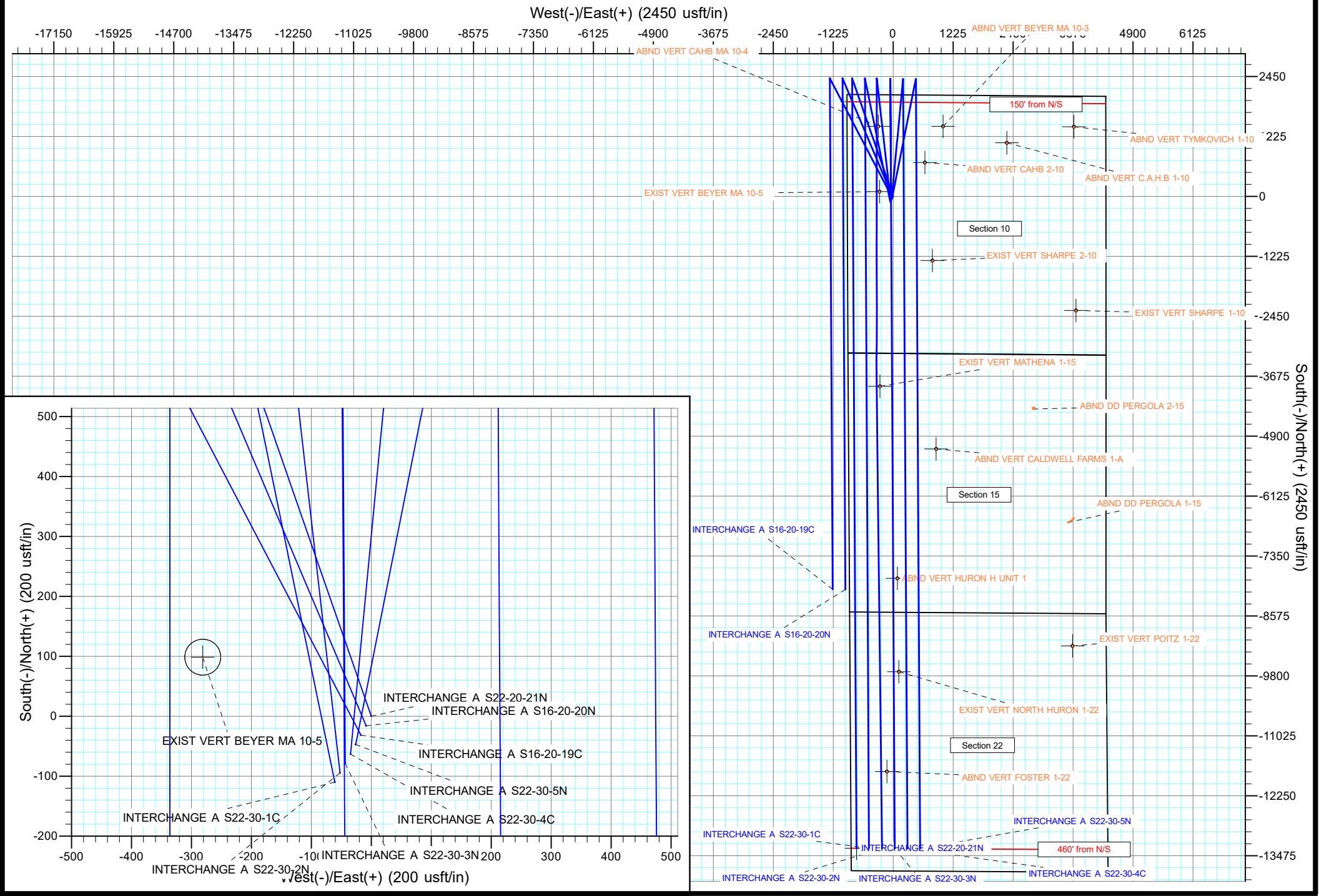
**ORIGINAL WELLBORE**
**PROPOSAL 1**

# Anticollision Report

**23 January, 2018**

EXTRACTION Oil & Gas

**Project:** Broomfield County
**Site:** Sec 10-T1S-R68W
**Well:** INTERCHANGE A S22-20-21N
ORIGINAL WELLBORE
PROPOSAL 1



# Anticollision Report

| | | | |
|---|---|---|---|
| **Company:** | EXTRACTION OIL & GAS | **Local Co-ordinate Reference:** | Well INTERCHANGE A S16-20-19C |
| **Project:** | Broomfield County | **TVD Reference:** | KB 25' @ 5261.00usft |
| **Reference Site:** | Sec 10-T1S-R68W | **MD Reference:** | KB 25' @ 5261.00usft |
| **Site Error:** | 0.00 usft | **North Reference:** | True |
| **Reference Well:** | INTERCHANGE A S16-20-19C | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | ORIGINAL WELLBORE | **Database:** | EDT_32Bit_ODBC |
| **Reference Design:** | PROPOSAL 1 | **Offset TVD Reference:** | Offset Datum |

| | | | |
|---|---|---|---|
| **Reference** | PROPOSAL 1 | | |
| **Filter type:** | NO GLOBAL FILTER: Using user defined selection & filtering criteria | | |
| **Interpolation Method:** | MD + Stations Interval 100.00usft | **Error Model:** | ISCWSA |
| **Depth Range:** | Unlimited | **Scan Method:** | Closest Approach 3D |
| **Results Limited by:** | Maximum center-center distance of 9,999.98 usft | **Error Surface:** | Pedal Curve |
| **Warning Levels Evaluated at:** | 2.00 **Sigma** | **Casing Method:** | Not applied |

**Survey Tool Program** **Date** 1/23/2018

| From (usft) | To (usft) | Survey (Wellbore) | Tool Name | Description |
|---|---|---|---|---|
| 0.00 | 18,885.05 | PROPOSAL 1 (ORIGINAL WELLBORE) | MWD OWSG | OWSG MWD - Standard |

**Summary**

| Site Name / Offset Well - Wellbore - Design | Reference Measured Depth (usft) | Offset Measured Depth (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| Sec 10-T1S-R68W | | | | | | |
| ABND VERT BEYER MA 10-3 - Wellbore #1 - Design #1 | 2,717.08 | 2,526.25 | 1,595.13 | 1,527.79 | 23.686 | CC |
| ABND VERT BEYER MA 10-3 - Wellbore #1 - Design #1 | 3,000.00 | 2,785.41 | 1,599.17 | 1,524.45 | 21.402 | ES |
| ABND VERT BEYER MA 10-3 - Wellbore #1 - Design #1 | 9,500.00 | 8,067.00 | 2,309.01 | 2,100.79 | 11.089 | SF |
| ABND VERT C.A.H.B 1-10 - Wellbore #1 - Design #1 | 100.00 | 24.00 | 2,595.82 | 2,595.40 | 6,151.227 | CC |
| ABND VERT C.A.H.B 1-10 - Wellbore #1 - Design #1 | 1,000.00 | 909.27 | 2,604.17 | 2,582.20 | 118.550 | ES |
| ABND VERT C.A.H.B 1-10 - Wellbore #1 - Design #1 | 10,000.00 | 8,027.99 | 3,616.11 | 3,408.93 | 17.454 | SF |
| ABND VERT CAHB 2-10 - Wellbore #1 - Design #1 | 1,514.44 | 1,422.66 | 922.15 | 886.27 | 25.698 | CC |
| ABND VERT CAHB 2-10 - Wellbore #1 - Design #1 | 1,700.00 | 1,607.37 | 925.15 | 884.17 | 22.573 | ES |
| ABND VERT CAHB 2-10 - Wellbore #1 - Design #1 | 10,300.00 | 8,064.99 | 1,935.56 | 1,727.21 | 9.290 | SF |
| ABND VERT CAHB MA 10-4 - Wellbore #1 - Design #1 | 4,245.02 | 3,943.83 | 423.16 | 315.39 | 3.926 | CC |
| ABND VERT CAHB MA 10-4 - Wellbore #1 - Design #1 | 4,300.00 | 4,005.81 | 423.74 | 314.32 | 3.873 | ES |
| ABND VERT CAHB MA 10-4 - Wellbore #1 - Design #1 | 4,500.00 | 4,177.38 | 435.35 | 321.51 | 3.824 | SF |
| ABND VERT TYMKOVICH 1-10 - Wellbore #1 - Design # | 100.00 | 19.00 | 3,983.80 | 3,983.63 | 10,000.000 | CC |
| ABND VERT TYMKOVICH 1-10 - Wellbore #1 - Design # | 300.00 | 218.84 | 3,984.56 | 3,983.11 | 2,759.921 | ES |
| ABND VERT TYMKOVICH 1-10 - Wellbore #1 - Design # | 6,300.00 | 5,180.00 | 4,819.27 | 4,761.97 | 84.103 | SF |
| EXIST VERT BEYER MA 10-5 - Wellbore #1 - Design #1 | 1,274.64 | 1,228.00 | 173.38 | 143.19 | 5.743 | CC |
| EXIST VERT BEYER MA 10-5 - Wellbore #1 - Design #1 | 1,300.00 | 1,251.24 | 173.68 | 142.84 | 5.632 | ES |
| EXIST VERT BEYER MA 10-5 - Wellbore #1 - Design #1 | 10,800.00 | 8,089.99 | 1,002.80 | 792.14 | 4.760 | SF |
| EXIST VERT SHARPE 1-10 - Wellbore #1 - Design #1 | 100.00 | 16.00 | 4,398.46 | 4,398.13 | 10,000.000 | CC |
| EXIST VERT SHARPE 1-10 - Wellbore #1 - Design #1 | 200.00 | 115.98 | 4,399.96 | 4,397.90 | 2,137.372 | ES |
| EXIST VERT SHARPE 1-10 - Wellbore #1 - Design #1 | 14,300.00 | 8,019.97 | 5,118.78 | 4,870.59 | 20.625 | SF |
| EXIST VERT SHARPE 2-10 - Wellbore #1 - Design #1 | 100.00 | 48.00 | 1,518.81 | 1,518.10 | 2,159.903 | CC |
| EXIST VERT SHARPE 2-10 - Wellbore #1 - Design #1 | 200.00 | 147.98 | 1,520.55 | 1,517.77 | 546.904 | ES |
| EXIST VERT SHARPE 2-10 - Wellbore #1 - Design #1 | 12,400.00 | 8,051.98 | 2,088.01 | 1,863.42 | 9.297 | SF |
| INTERCHANGE A S16-20-20N - ORIGINAL WELLBORE | 370.85 | 370.35 | 15.51 | 13.28 | 6.960 | CC |
| INTERCHANGE A S16-20-20N - ORIGINAL WELLBORE | 400.00 | 399.45 | 15.56 | 13.12 | 6.368 | ES |
| INTERCHANGE A S16-20-20N - ORIGINAL WELLBORE | 18,885.49 | 18,601.04 | 370.42 | 111.41 | 1.430 | Level 3, SF |
| INTERCHANGE A S22-20-21N - ORIGINAL WELLBORE | 438.20 | 437.12 | 30.54 | 27.81 | 11.202 | CC |
| INTERCHANGE A S22-20-21N - ORIGINAL WELLBORE | 500.00 | 498.64 | 30.95 | 27.76 | 9.695 | ES |
| INTERCHANGE A S22-20-21N - ORIGINAL WELLBORE | 18,885.49 | 18,573.62 | 528.92 | 233.00 | 1.787 | SF |
| INTERCHANGE A S22-30-1C - ORIGINAL WELLBORE | 100.00 | 100.00 | 89.88 | 89.61 | 334.307 | CC, ES |
| INTERCHANGE A S22-30-1C - ORIGINAL WELLBORE | 18,885.49 | 18,828.66 | 715.53 | 386.37 | 2.174 | SF |
| INTERCHANGE A S22-30-2N - ORIGINAL WELLBORE | 100.00 | 100.00 | 71.97 | 71.70 | 267.686 | CC, ES |
| INTERCHANGE A S22-30-2N - ORIGINAL WELLBORE | 18,885.49 | 18,564.12 | 984.58 | 665.90 | 3.090 | SF |
| INTERCHANGE A S22-30-3N - ORIGINAL WELLBORE | 100.00 | 100.00 | 54.06 | 53.79 | 201.064 | CC, ES |
| INTERCHANGE A S22-30-3N - ORIGINAL WELLBORE | 18,885.49 | 18,561.18 | 1,267.02 | 944.50 | 3.928 | SF |
| INTERCHANGE A S22-30-4C - ORIGINAL WELLBORE | 100.00 | 100.00 | 36.15 | 35.88 | 134.443 | CC, ES |

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

# Anticollision Report

| | | | |
|---|---|---|---|
| **Company:** | EXTRACTION OIL & GAS | **Local Co-ordinate Reference:** | Well INTERCHANGE A S16-20-19C |
| **Project:** | Broomfield County | **TVD Reference:** | KB 25' @ 5261.00usft |
| **Reference Site:** | Sec 10-T1S-R68W | **MD Reference:** | KB 25' @ 5261.00usft |
| **Site Error:** | 0.00 usft | **North Reference:** | True |
| **Reference Well:** | INTERCHANGE A S16-20-19C | **Survey Calculation Method:** | Minimum Curvature |
| **Well Error:** | 0.00 usft | **Output errors are at** | 2.00 sigma |
| **Reference Wellbore** | ORIGINAL WELLBORE | **Database:** | EDT_32Bit_ODBC |
| **Reference Design:** | PROPOSAL 1 | **Offset TVD Reference:** | Offset Datum |

**Summary**

| Site Name<br>Offset Well - Wellbore - Design | Reference Measured Depth (usft) | Offset Measured Depth (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|
| Sec 10-T1S-R68W | | | | | | |
| INTERCHANGE A S22-30-4C - ORIGINAL WELLBORE | 18,885.49 | 18,804.86 | 1,498.76 | 1,170.36 | 4.564 | SF |
| INTERCHANGE A S22-30-5N - ORIGINAL WELLBORE | 100.00 | 100.00 | 17.92 | 17.65 | 66.635 | CC, ES |
| INTERCHANGE A S22-30-5N - ORIGINAL WELLBORE | 18,885.49 | 18,578.07 | 1,778.12 | 1,453.03 | 5.469 | SF |
| Sec 15-T1S-R68W | | | | | | |
| ABND DD PERGOLA 1-15 - Wellbore #1 - Wellbore #1 | 17,546.36 | 7,500.00 | 4,836.15 | 4,668.27 | 28.808 | CC |
| ABND DD PERGOLA 1-15 - Wellbore #1 - Wellbore #1 | 17,600.00 | 7,500.00 | 4,836.45 | 4,667.77 | 28.672 | ES |
| ABND DD PERGOLA 1-15 - Wellbore #1 - Wellbore #1 | 18,700.00 | 7,500.00 | 4,971.84 | 4,790.60 | 27.432 | SF |
| ABND DD PERGOLA 2-15 - Wellbore #1 - Wellbore #1 | 15,222.62 | 7,500.00 | 4,154.66 | 4,025.44 | 32.152 | CC |
| ABND DD PERGOLA 2-15 - Wellbore #1 - Wellbore #1 | 15,300.00 | 7,500.00 | 4,155.38 | 4,025.05 | 31.883 | ES |
| ABND DD PERGOLA 2-15 - Wellbore #1 - Wellbore #1 | 16,300.00 | 7,500.00 | 4,292.08 | 4,150.53 | 30.323 | SF |
| ABND VERT CALDWELL FARMS 1-A - Wellbore #1 - De | 16,028.08 | 8,048.96 | 2,130.91 | 1,851.81 | 7.635 | CC, ES |
| ABND VERT CALDWELL FARMS 1-A - Wellbore #1 - De | 16,200.00 | 8,048.96 | 2,137.84 | 1,856.91 | 7.610 | SF |
| ABND VERT HURON H UNIT 1 - Wellbore #1 - Design # | 18,668.72 | 8,076.94 | 1,324.69 | 1,000.84 | 4.090 | CC, ES |
| ABND VERT HURON H UNIT 1 - Wellbore #1 - Design # | 18,700.00 | 8,076.94 | 1,325.06 | 1,000.95 | 4.088 | SF |
| EXIST VERT MATHENA 1-15 - Wellbore #1 - Design #1 | 14,741.07 | 8,071.97 | 989.30 | 730.37 | 3.821 | CC, ES, SF |
| Sec 16-T1S-R68W | | | | | | |
| ABND VERT COOPER 1-16 - Wellbore #1 - Design #1 | 17,353.83 | 8,105.95 | 1,100.11 | 797.89 | 3.640 | CC |
| ABND VERT COOPER 1-16 - Wellbore #1 - Design #1 | 17,400.00 | 8,105.95 | 1,101.07 | 797.83 | 3.631 | ES, SF |
| ABND VERT COOPER 2-16 - Wellbore #1 - Design #1 | 18,004.56 | 8,112.95 | 2,774.12 | 2,460.81 | 8.854 | CC |
| ABND VERT COOPER 2-16 - Wellbore #1 - Design #1 | 18,100.00 | 8,112.95 | 2,775.77 | 2,460.61 | 8.808 | ES |
| ABND VERT COOPER 2-16 - Wellbore #1 - Design #1 | 18,300.00 | 8,112.94 | 2,789.81 | 2,471.33 | 8.760 | SF |
| EXIST VERT MALONEY 1-16 - Wellbore #1 - Design #1 | 14,651.52 | 8,102.97 | 1,771.52 | 1,513.37 | 6.862 | CC |
| EXIST VERT MALONEY 1-16 - Wellbore #1 - Design #1 | 14,700.00 | 8,102.97 | 1,772.18 | 1,513.14 | 6.841 | ES |
| EXIST VERT MALONEY 1-16 - Wellbore #1 - Design #1 | 14,800.00 | 8,102.97 | 1,777.73 | 1,517.01 | 6.819 | SF |
| EXIST VERT MALONEY 2-16 - Wellbore #1 - Design #1 | 15,010.95 | 8,140.96 | 3,931.71 | 3,667.14 | 14.861 | CC |
| EXIST VERT MALONEY 2-16 - Wellbore #1 - Design #1 | 15,100.00 | 8,140.96 | 3,932.71 | 3,666.61 | 14.779 | ES |
| EXIST VERT MALONEY 2-16 - Wellbore #1 - Design #1 | 15,800.00 | 8,140.96 | 4,010.10 | 3,733.34 | 14.490 | SF |
| Sec 22-T1S-R68W | | | | | | |
| ABND VERT FOSTER 1-22 - Wellbore #1 - Design #1 | 18,885.49 | 8,033.00 | 3,885.30 | 3,653.03 | 16.728 | CC, ES, SF |
| EXIST VERT NORTH HURON 1-22 - Wellbore #1 - Desi | 18,885.49 | 8,050.00 | 2,159.62 | 1,881.85 | 7.775 | CC, ES, SF |
| EXIST VERT POITZ 1-22 - Wellbore #1 - Design #1 | 18,885.49 | 8,015.00 | 5,036.62 | 4,712.55 | 15.542 | CC, ES, SF |
| Sec 9-T1S-R68W | | | | | | |
| EXIST VERT NORDSTROM 1-9 - Wellbore #1 - Design # | 10,470.37 | 8,105.99 | 319.03 | 109.87 | 1.525 | CC, ES, SF |
| EXIST VERT NORDSTROM 3-9 - Wellbore #1 - Design # | 10,100.00 | 8,146.99 | 3,074.73 | 2,865.30 | 14.682 | SF |
| EXIST VERT NORDSTROM 3-9 - Wellbore #1 - Design # | 10,221.89 | 8,146.99 | 3,072.31 | 2,863.07 | 14.683 | CC, ES |
| EXIST VERT WWC 01-09 - Wellbore #1 - Design #1 | 13,109.46 | 8,113.98 | 1,978.73 | 1,743.23 | 8.402 | CC, ES |
| EXIST VERT WWC 01-09 - Wellbore #1 - Design #1 | 13,300.00 | 8,113.97 | 1,987.88 | 1,749.62 | 8.343 | SF |
| EXIST VERT WWC 2-9 - Wellbore #1 - Design #1 | 13,529.47 | 8,104.03 | 470.43 | 229.19 | 1.950 | CC, ES, SF |

**Offset Design** Sec 10-T1S-R68W - ABND VERT BEYER MA 10-3 - Wellbore #1 - Design #1

**Survey Program:** 0-INC

**Offset Site Error:** 0.00 usft

**Offset Well Error:** 0.00 usft

| Reference Measured Depth (usft) | Reference Vertical Depth (usft) | Offset Measured Depth (usft) | Offset Vertical Depth (usft) | Semi Major Axis Reference (usft) | Semi Major Axis Offset (usft) | Highside Toolface (°) | Offset Wellbore Centre +N/-S (usft) | Offset Wellbore Centre +E/-W (usft) | Distance Between Centres (usft) | Distance Between Ellipses (usft) | Minimum Separation (usft) | Separation Factor | Warning |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 35.29 | 1,462.57 | 1,035.12 | 1,792.19 | | | | |
| 100.00 | 100.00 | 63.00 | 63.00 | 0.13 | 0.75 | 35.29 | 1,462.57 | 1,035.12 | 1,791.81 | 1,790.93 | 0.88 | 2,034.025 | |
| 200.00 | 199.98 | 162.98 | 162.98 | 0.50 | 2.63 | 62.97 | 1,462.57 | 1,035.12 | 1,791.02 | 1,787.90 | 3.12 | 573.623 | |
| 300.00 | 299.84 | 262.84 | 262.84 | 0.86 | 4.78 | 63.16 | 1,462.57 | 1,035.12 | 1,788.64 | 1,783.00 | 5.64 | 316.995 | |