EXTRACTION OIL & GAS

Broomfield County
Sec 9-T1S-R68W
NORTHWEST A S20-25-13N

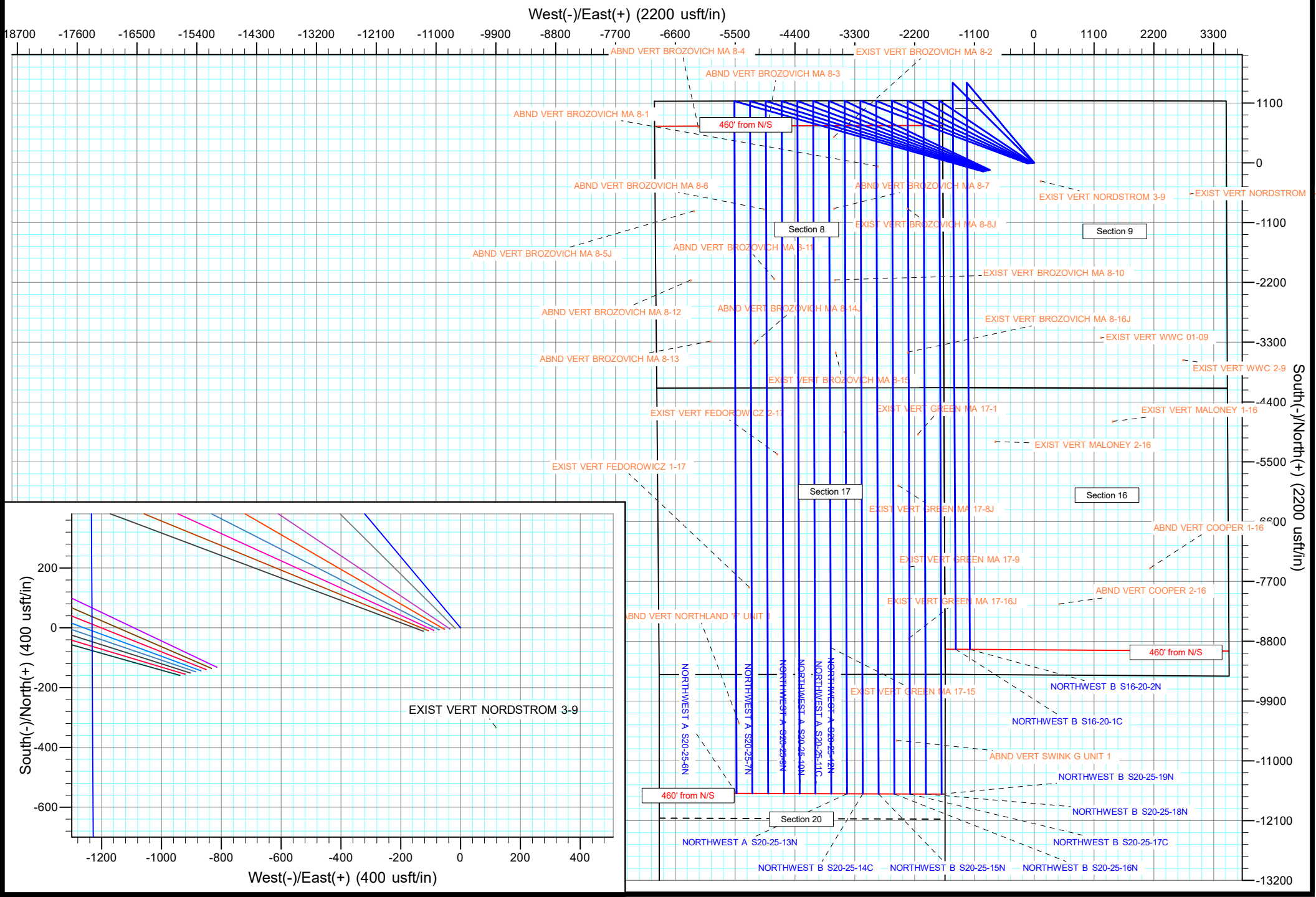
ORIGINAL WELLBORE
PROPOSAL 1

Anticollision Report

18 January, 2018

EXTRACTION Oil & Gas

Project: Broomfield County
Site: Sec 9-T1S-R68W
Well: NORTHWEST B S16-20-2N
ORIGINAL WELLBORE
PROPOSAL 1



Anticollision Report

Company:	EXTRACTION OIL & GAS	**Local Co-ordinate Reference:**	Well NORTHWEST A S20-25-13N
Project:	Broomfield County	**TVD Reference:**	KB 25' @ 5318.00usft
Reference Site:	Sec 9-T1S-R68W	**MD Reference:**	KB 25' @ 5318.00usft
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	NORTHWEST A S20-25-13N	**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** 1/4/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	21,368.87	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 17-T1S-R68W						
EXIST VERT FEDOROWICZ 1-17 - Wellbore #1 - Design	17,560.68	8,026.95	1,785.77	1,475.14	5.749	CC
EXIST VERT FEDOROWICZ 1-17 - Wellbore #1 - Design	17,600.00	8,026.95	1,786.20	1,474.47	5.730	ES
EXIST VERT FEDOROWICZ 1-17 - Wellbore #1 - Design	17,800.00	8,026.95	1,801.74	1,485.36	5.695	SF
EXIST VERT FEDOROWICZ 2-17 - Wellbore #1 - Design	15,114.63	8,062.96	1,261.23	991.11	4.669	CC, ES
EXIST VERT FEDOROWICZ 2-17 - Wellbore #1 - Design	15,300.00	8,062.96	1,274.78	999.81	4.636	SF
EXIST VERT GREEN MA 17-1 - Wellbore #1 - Design #1	14,755.86	8,023.97	1,327.03	1,063.65	5.038	CC, ES, SF
EXIST VERT GREEN MA 17-15 - Wellbore #1 - Design #	18,681.44	7,988.94	288.12	-41.03	0.875	Level 1, CC
EXIST VERT GREEN MA 17-15 - Wellbore #1 - Design #	18,700.00	7,988.94	288.71	-41.85	0.873	Level 1, ES, SF
EXIST VERT GREEN MA 17-16J - Wellbore #1 - Design	18,514.55	7,972.94	1,148.56	822.62	3.524	CC, ES, SF
EXIST VERT GREEN MA 17-2 - Wellbore #1 - Design #1	14,711.04	8,042.97	26.56	-236.48	0.101	Level 1, CC, ES, SF
EXIST VERT GREEN MA 17-8J - Wellbore #1 - Design #	15,700.00	8,007.96	964.97	686.22	3.462	ES, SF
EXIST VERT GREEN MA 17-8J - Wellbore #1 - Design #	15,701.71	8,007.96	964.97	686.22	3.462	CC
EXIST VERT GREEN MA 17-9 - Wellbore #1 - Design #1	17,200.00	7,983.95	1,165.20	861.57	3.838	ES, SF
EXIST VERT GREEN MA 17-9 - Wellbore #1 - Design #1	17,200.31	7,983.95	1,165.20	861.57	3.838	CC

Company:	EXTRACTION OIL & GAS	**Local Co-ordinate Reference:**	Well NORTHWEST A S20-25-13N
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Reference Site:	Sec 9-T1S-R68W	**MD Reference:**	KB 25' @ 5318.00usft
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	NORTHWEST A S20-25-13N	**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 Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Sec 8-T1S-R68W						
ABND VERT BROZOVICH MA 8-1 - Wellbore #1 - Desig	9,825.41	8,004.00	602.72	402.81	3.015	CC, ES
ABND VERT BROZOVICH MA 8-1 - Wellbore #1 - Desig	9,900.00	8,004.00	607.32	404.69	2.997	SF
ABND VERT BROZOVICH MA 8-11 - Wellbore #1 - Desi	11,890.63	8,064.98	1,308.52	1,088.13	5.937	CC
ABND VERT BROZOVICH MA 8-11 - Wellbore #1 - Desi	11,900.00	8,064.98	1,308.56	1,088.00	5.933	ES
ABND VERT BROZOVICH MA 8-11 - Wellbore #1 - Desi	12,000.00	8,064.98	1,313.09	1,090.71	5.905	SF
ABND VERT BROZOVICH MA 8-12 - Wellbore #1 - Desi	11,910.58	8,058.98	2,841.55	2,754.02	32.463	CC, ES
ABND VERT BROZOVICH MA 8-12 - Wellbore #1 - Desi	13,200.00	8,058.98	3,120.42	3,011.94	28.767	SF
ABND VERT BROZOVICH MA 8-13 - Wellbore #1 - Desi	13,037.50	8,150.98	2,481.32	2,242.71	10.399	CC
ABND VERT BROZOVICH MA 8-13 - Wellbore #1 - Desi	13,100.00	8,150.98	2,482.11	2,242.25	10.348	ES
ABND VERT BROZOVICH MA 8-13 - Wellbore #1 - Desi	13,500.00	8,150.97	2,524.06	2,276.48	10.195	SF
ABND VERT BROZOVICH MA 8-14J - Wellbore #1 - Des	13,073.21	8,107.98	1,674.30	1,436.03	7.027	CC
ABND VERT BROZOVICH MA 8-14J - Wellbore #1 - Des	13,100.00	8,107.98	1,674.52	1,435.65	7.010	ES
ABND VERT BROZOVICH MA 8-14J - Wellbore #1 - Des	13,300.00	8,107.98	1,689.59	1,446.42	6.948	SF
ABND VERT BROZOVICH MA 8-3 - Wellbore #1 - Desig	8,975.00	8,008.69	1,436.05	1,232.75	7.064	SF
ABND VERT BROZOVICH MA 8-3 - Wellbore #1 - Desig	9,099.98	8,008.00	1,427.90	1,227.63	7.130	ES
ABND VERT BROZOVICH MA 8-3 - Wellbore #1 - Desig	9,132.63	8,008.00	1,427.53	1,227.96	7.153	CC
ABND VERT BROZOVICH MA 8-4 - Wellbore #1 - Desig	8,875.00	7,912.23	2,701.23	2,500.49	13.456	SF
ABND VERT BROZOVICH MA 8-4 - Wellbore #1 - Desig	9,075.00	7,964.26	2,692.93	2,493.89	13.529	ES
ABND VERT BROZOVICH MA 8-4 - Wellbore #1 - Desig	9,096.00	7,964.97	2,692.85	2,494.06	13.546	CC
ABND VERT BROZOVICH MA 8-5J - Wellbore #1 - Desi	10,636.58	8,011.99	2,776.93	2,571.83	13.539	CC, ES
ABND VERT BROZOVICH MA 8-5J - Wellbore #1 - Desi	11,200.00	8,011.99	2,833.51	2,622.35	13.419	SF
ABND VERT BROZOVICH MA 8-6 - Wellbore #1 - Desig	10,608.45	8,031.99	1,490.56	1,285.30	7.262	CC, ES
ABND VERT BROZOVICH MA 8-6 - Wellbore #1 - Desig	10,700.00	8,031.99	1,493.37	1,287.62	7.258	SF
ABND VERT BROZOVICH MA 8-7 - Wellbore #1 - Desig	10,600.00	8,036.99	199.79	-5.55	0.973	Level 1, ES, SF
ABND VERT BROZOVICH MA 8-7 - Wellbore #1 - Desig	10,601.40	8,036.99	199.78	-5.51	0.973	Level 1, CC
EXIST VERT BROZOVICH MA 8-10 - Wellbore #1 - Des	11,916.48	8,106.02	187.63	99.85	2.137	CC, ES, SF
EXIST VERT BROZOVICH MA 8-15 - Wellbore #1 - Des	13,251.93	8,067.98	181.43	-58.80	0.755	Level 1, CC, ES, SF
EXIST VERT BROZOVICH MA 8-16J - Wellbore #1 - De	13,250.77	8,028.98	1,144.50	905.07	4.780	CC, ES, SF
EXIST VERT BROZOVICH MA 8-2 - Wellbore #1 - Desig	9,282.73	8,020.00	197.92	-1.65	0.992	Level 1, CC, ES, SF
EXIST VERT BROZOVICH MA 8-8J - Wellbore #1 - Desi	10,606.13	8,021.99	1,145.31	940.28	5.586	CC, ES
EXIST VERT BROZOVICH MA 8-8J - Wellbore #1 - Desi	10,700.00	8,021.99	1,149.15	942.65	5.565	SF

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Project:	Broomfield County	**TVD Reference:**	KB 25' @ 5318.00usft
Reference Site:	Sec 9-T1S-R68W	**MD Reference:**	KB 25' @ 5318.00usft
Site Error:	0.00 usft	**North Reference:**	True
Reference Well:	NORTHWEST A S20-25-13N	**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 Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Sec 9-T1S-R68W						
EXIST VERT NORDSTROM 1-9 - Wellbore #1 - Design #	1,500.00	1,445.00	3,713.19	3,679.37	109.763	CC
EXIST VERT NORDSTROM 1-9 - Wellbore #1 - Design #	1,600.00	1,544.98	3,714.85	3,678.65	102.635	ES
EXIST VERT NORDSTROM 1-9 - Wellbore #1 - Design #	12,300.00	7,947.98	6,645.24	6,424.08	30.047	SF
EXIST VERT NORDSTROM 3-9 - Wellbore #1 - Design #	1,500.00	1,486.00	954.49	919.83	27.543	CC
EXIST VERT NORDSTROM 3-9 - Wellbore #1 - Design #	1,600.00	1,585.98	956.19	919.17	25.829	ES
EXIST VERT NORDSTROM 3-9 - Wellbore #1 - Design #	10,800.00	7,988.99	3,664.91	3,457.21	17.645	SF
EXIST VERT WWC 01-09 - Wellbore #1 - Design #1	1,500.00	1,453.00	3,697.71	3,663.72	108.787	CC
EXIST VERT WWC 01-09 - Wellbore #1 - Design #1	1,600.00	1,552.98	3,699.21	3,662.85	101.749	ES
EXIST VERT WWC 01-09 - Wellbore #1 - Design #1	13,900.00	7,955.97	4,785.75	4,541.24	19.573	SF
EXIST VERT WWC 2-9 - Wellbore #1 - Design #1	1,500.00	1,435.00	4,983.31	4,949.69	148.189	CC
EXIST VERT WWC 2-9 - Wellbore #1 - Design #1	1,600.00	1,534.98	4,984.96	4,948.97	138.495	ES
EXIST VERT WWC 2-9 - Wellbore #1 - Design #1	15,000.00	7,937.97	6,408.68	6,149.58	24.734	SF
NORTHWEST A S20-25-10N - ORIGINAL WELLBORE -	900.00	900.00	54.04	48.03	8.999	CC, ES
NORTHWEST A S20-25-10N - ORIGINAL WELLBORE -	21,369.71	21,703.79	870.21	439.08	2.018	SF
NORTHWEST A S20-25-11C - ORIGINAL WELLBORE -	1,100.00	1,100.00	35.93	28.49	4.831	CC, ES
NORTHWEST A S20-25-11C - ORIGINAL WELLBORE -	21,369.71	21,787.85	629.52	230.96	1.580	SF
NORTHWEST A S20-25-12N - ORIGINAL WELLBORE -	1,300.00	1,300.00	17.83	8.96	2.010	CC
NORTHWEST A S20-25-12N - ORIGINAL WELLBORE -	21,369.71	21,482.42	290.17	-141.02	0.673	Level 1, ES, SF
NORTHWEST A S20-25-6N - ORIGINAL WELLBORE - P	100.00	100.00	125.82	125.55	467.998	CC, ES
NORTHWEST A S20-25-6N - ORIGINAL WELLBORE - P	21,369.71	22,182.19	2,030.88	1,599.13	4.704	SF
NORTHWEST A S20-25-7N - ORIGINAL WELLBORE - P	300.00	300.00	107.99	106.29	63.423	CC, ES
NORTHWEST A S20-25-7N - ORIGINAL WELLBORE - P	21,369.71	22,058.86	1,740.71	1,308.90	4.031	SF
NORTHWEST A S20-25-8C - ORIGINAL WELLBORE - P	500.00	500.00	89.89	86.75	28.658	CC, ES
NORTHWEST A S20-25-8C - ORIGINAL WELLBORE - P	21,369.71	22,114.90	1,470.90	1,047.22	3.472	SF
NORTHWEST A S20-25-9N - ORIGINAL WELLBORE - P	700.00	700.00	71.79	67.21	15.706	CC, ES
NORTHWEST A S20-25-9N - ORIGINAL WELLBORE - P	21,369.71	21,803.23	1,160.28	728.25	2.686	SF

Offset Design Sec 17-T1S-R68W - EXIST VERT FEDOROWICZ 1-17 - 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	24.00	24.00	0.00	0.28	-150.02	-7,671.56	-4,426.08	8,856.81				
100.00	100.00	124.00	124.00	0.13	1.71	-150.02	-7,671.56	-4,426.08	8,856.81	8,854.96	1.84	4,802.089	
200.00	200.00	224.00	224.00	0.49	3.96	-150.02	-7,671.56	-4,426.08	8,856.81	8,852.36	4.45	1,990.869	
300.00	300.00	324.00	324.00	0.85	6.03	-150.02	-7,671.56	-4,426.08	8,856.81	8,849.93	6.88	1,287.814	
400.00	400.00	424.00	424.00	1.21	8.07	-150.02	-7,671.56	-4,426.08	8,856.81	8,847.53	9.28	954.907	
500.00	500.00	524.00	524.00	1.57	10.09	-150.02	-7,671.56	-4,426.08	8,856.81	8,845.14	11.66	759.516	
600.00	600.00	624.00	624.00	1.93	12.11	-150.02	-7,671.56	-4,426.08	8,856.81	8,842.76	14.04	630.757	
700.00	700.00	724.00	724.00	2.29	14.13	-150.02	-7,671.56	-4,426.08	8,856.81	8,840.39	16.42	539.431	
800.00	800.00	824.00	824.00	2.64	16.15	-150.02	-7,671.56	-4,426.08	8,856.81	8,838.01	18.79	471.255	
900.00	900.00	924.00	924.00	3.00	18.17	-150.02	-7,671.56	-4,426.08	8,856.81	8,835.64	21.17	418.405	
1,000.00	1,000.00	1,024.00	1,024.00	3.36	20.18	-150.02	-7,671.56	-4,426.08	8,856.81	8,833.26	23.54	376.227	
1,100.00	1,100.00	1,124.00	1,124.00	3.72	22.19	-150.02	-7,671.56	-4,426.08	8,856.81	8,830.89	25.91	341.784	
1,200.00	1,200.00	1,224.00	1,224.00	4.08	24.21	-150.02	-7,671.56	-4,426.08	8,856.81	8,828.52	28.29	313.123	
1,300.00	1,300.00	1,324.00	1,324.00	4.44	26.22	-150.02	-7,671.56	-4,426.08	8,856.81	8,826.15	30.66	288.901	
1,400.00	1,400.00	1,424.00	1,424.00	4.79	28.23	-150.02	-7,671.56	-4,426.08	8,856.81	8,823.78	33.03	268.160	
1,500.00	1,500.00	1,524.00	1,524.00	5.15	30.25	-150.02	-7,671.56	-4,426.08	8,856.81	8,821.41	35.40	250.199	
1,600.00	1,599.98	1,623.98	1,623.98	5.51	32.26	-85.48	-7,671.56	-4,426.08	8,856.67	8,818.90	37.76	234.522	
1,700.00	1,699.84	1,723.84	1,723.84	5.86	34.27	-85.52	-7,671.56	-4,426.08	8,856.26	8,816.13	40.13	220.716	

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