

WELL DETAILS											
	+N/-S	+E/-W	Northing	Ground Level:	5019.50						
	0.00	0.00	1249311.920	Easting	3169023.180	Latitude	40° 0' 58.20836 N	Longitude	104° 53' 47.50440 W		

SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target	Annotation
1	7566.00	1.30	110.60	7537.86	-16.28	-318.76	0.00	0.00	318.76		Tie In
2	7635.00	1.30	110.60	7606.84	-16.83	-317.29	0.00	0.00	317.29		PTB, Begin 3.50°/100' Drop & Turn
3	7672.14	0.00	0.00	7643.98	-16.98	-316.90	3.50	180.00	316.90		Begin Vertical Hold
4	11330.16	0.00	0.00	11302.00	-16.98	-316.90	0.00	0.00	316.90	BHL-NGL C-2Cv4	TD at 11330.16

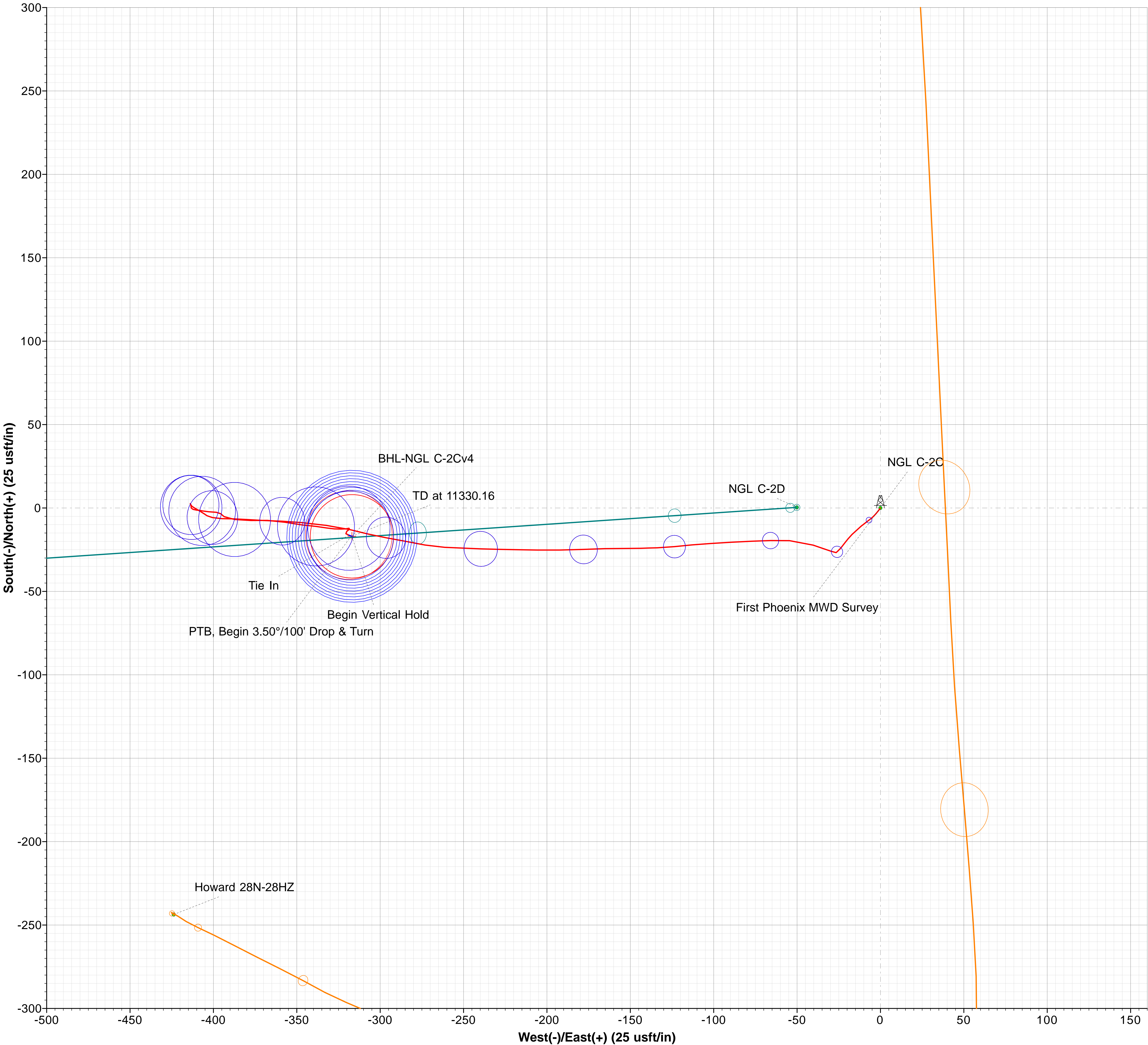
DESIGN TARGET DETAILS									
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape	
BHL-NGL C-2Cv4	11302.00	-16.98	-316.90	1249292.784	3168706.403	40° 0' 58.04053 N	104° 53' 51.57756 W	Circle (Radius: 25.00)	
- plan misses target center by 0.01usft at 11330.16usft MD (11302.00 TVD, -16.98 N, -316.90 E)									

LEGEND			
Howard 28N-28HZ, OH, OH V0			
NGL C-2D, OH, OH V0			
NGL C-2C, OH / Job #60004, Surveys (Savanna 802) V0			
Plan 4 03-21-16			

CASING DETAILS			
TVD	MD	Name	Size
9311.00	9339.16	8-3/4	8-3/4

Map System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone Name: Colorado Northern Zone
Local Origin: Well NGL C-2C, True North
Latitude: 40° 0' 58.20836 N
Longitude: 104° 53' 47.50440 W
Grid East: 3169023.180
Grid North: 1249311.920
Scale Factor: 1.000
Geomagnetic Model: HDGM
Sample Date: 17-Mar-16
Magnetic Declination: 8.48°
Dip Angle from Horizontal: 66.47°
Magnetic Field Strength: 52328
To convert a Magnetic Direction to a Grid Direction, Add 8.09°
To convert a Magnetic Direction to a True Direction, Add 8.48° East
To convert a True Direction to a Grid Direction, Subtract 0.39°

FORMATION TOP DETAILS
No formation data is available



# **NGL Water Solutions DJ LLC**

**Weld County, CO (NAD83)**

**Sec28-T1N-R67W**

**NGL C-2C**

**OH / Job #60004**

**Plan: Plan 4 03-21-16**

## **Standard Planning Report**

**21 March, 2016**



# Phoenix Technology Services LP

## Planning Report



<b>Database:</b>	Compass 5000 RMR	<b>Local Co-ordinate Reference:</b>	Well NGL C-2C
<b>Company:</b>	NGL Water Solutions DJ LLC	<b>TVD Reference:</b>	RKB @ 5042.00usft (Savanna 802)
<b>Project:</b>	Weld County, CO (NAD83)	<b>MD Reference:</b>	RKB @ 5042.00usft (Savanna 802)
<b>Site:</b>	Sec28-T1N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	NGL C-2C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH / Job #60004		
<b>Design:</b>	Plan 4 03-21-16		

<b>Project</b>	Weld County, CO (NAD83)		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Northern Zone		

Site		Sec28-T1N-R67W			
Site Position:		Northing:	1,249,311.920 usft	Latitude:	40° 0' 58.20840 N
From:	Lat/Long	Easting:	3,169,023.180 usft	Longitude:	104° 53' 47.50440 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.39 °

Well	NGL C-2C					
Well Position	+N/-S	0.00 usft	Northing:	1,249,311.920 usft	Latitude:	40° 0' 58.20836 N
	+E/-W	0.00 usft	Easting:	3,169,023.180 usft	Longitude:	104° 53' 47.50440 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	5,019.50 usft

<b>Wellbore</b>	OH / Job #60004				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	HDGM	3/17/2016	8.48	66.47	52,328

<b>Design</b>	Plan 4 03-21-16			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	7,566.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.00	0.00	0.00	270.00

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
7,566.00	1.30	110.60	7,537.86	-16.28	-318.76	0.00	0.00	0.00	0.00	
7,635.00	1.30	110.60	7,606.84	-16.83	-317.29	0.00	0.00	0.00	0.00	
7,672.14	0.00	0.00	7,643.98	-16.98	-316.90	3.50	-3.50	0.00	180.00	
11,330.16	0.00	0.00	11,302.00	-16.98	-316.90	0.00	0.00	0.00	0.00	BHL-NGL C-2Cv4

# Phoenix Technology Services LP

## Planning Report



<b>Database:</b>	Compass 5000 RMR	<b>Local Co-ordinate Reference:</b>	Well NGL C-2C
<b>Company:</b>	NGL Water Solutions DJ LLC	<b>TVD Reference:</b>	RKB @ 5042.00usft (Savanna 802)
<b>Project:</b>	Weld County, CO (NAD83)	<b>MD Reference:</b>	RKB @ 5042.00usft (Savanna 802)
<b>Site:</b>	Sec28-T1N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	NGL C-2C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH / Job #60004		
<b>Design:</b>	Plan 4 03-21-16		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
226.00	0.90	217.20	225.99	-1.41	-1.07	1.07	0.00	0.00	0.00
320.00	0.90	219.40	319.98	-2.57	-1.99	1.99	0.04	0.00	2.34
419.00	0.90	221.70	418.97	-3.75	-3.00	3.00	0.04	0.00	2.32
512.00	1.40	224.50	511.95	-5.11	-4.28	4.28	0.54	0.54	3.01
604.00	2.80	232.80	603.88	-7.27	-6.86	6.86	1.55	1.52	9.02
697.00	4.50	232.20	696.69	-10.88	-11.55	11.55	1.83	1.83	-0.65
791.00	4.60	223.40	790.40	-15.88	-17.05	17.05	0.75	0.11	-9.36
882.00	3.60	216.80	881.16	-20.82	-21.27	21.27	1.21	-1.10	-7.25
973.00	2.10	221.20	972.05	-24.36	-24.08	24.08	1.66	-1.65	4.84
1,065.00	1.30	231.90	1,064.01	-26.27	-26.01	26.01	0.93	-0.87	11.63
1,102.00	1.00	228.70	1,101.00	-26.74	-26.59	26.59	0.83	-0.81	-8.65
1,195.00	3.30	299.50	1,193.94	-25.96	-29.53	29.53	3.35	2.47	76.13
1,290.00	10.60	285.60	1,288.18	-22.26	-40.34	40.34	7.83	7.68	-14.63
1,385.00	7.00	273.10	1,382.06	-19.60	-54.54	54.54	4.27	-3.79	-13.16
1,481.00	6.60	267.60	1,477.38	-19.51	-65.89	65.89	0.80	-0.42	-5.73
1,575.00	7.40	268.00	1,570.68	-19.95	-77.34	77.34	0.85	0.85	0.43
1,670.00	7.40	266.50	1,664.89	-20.54	-89.56	89.56	0.20	0.00	-1.58
1,764.00	7.20	266.40	1,758.13	-21.27	-101.48	101.48	0.21	-0.21	-0.11
1,860.00	6.60	265.20	1,853.43	-22.11	-112.98	112.98	0.64	-0.63	-1.25
1,955.00	6.20	263.40	1,947.84	-23.16	-123.52	123.52	0.47	-0.42	-1.89
2,050.00	6.40	268.90	2,042.27	-23.85	-133.91	133.91	0.67	0.21	5.79
2,145.00	5.40	267.30	2,136.76	-24.16	-143.67	143.67	1.07	-1.05	-1.68
2,240.00	7.00	271.10	2,231.20	-24.26	-153.92	153.92	1.74	1.68	4.00
2,335.00	6.70	267.80	2,325.53	-24.37	-165.25	165.25	0.52	-0.32	-3.47
2,430.00	8.80	267.90	2,419.65	-24.84	-178.05	178.05	2.21	2.21	0.11
2,525.00	8.60	269.10	2,513.56	-25.22	-192.41	192.41	0.28	-0.21	1.26
2,619.00	7.90	271.00	2,606.59	-25.22	-205.90	205.90	0.80	-0.74	2.02
2,714.00	6.90	271.30	2,700.79	-24.98	-218.13	218.13	1.05	-1.05	0.32
2,810.00	6.10	270.70	2,796.18	-24.78	-229.00	229.00	0.84	-0.83	-0.63
2,905.00	6.80	272.30	2,890.57	-24.50	-239.67	239.67	0.76	0.74	1.68
3,000.00	6.50	272.60	2,984.94	-24.03	-250.66	250.66	0.32	-0.32	0.32
3,095.00	6.40	272.00	3,079.33	-23.60	-261.32	261.32	0.13	-0.11	-0.63
3,190.00	8.00	280.50	3,173.58	-22.21	-273.11	273.11	2.02	1.68	8.95
3,285.00	7.10	281.30	3,267.76	-19.85	-285.37	285.37	0.95	-0.95	0.84
3,380.00	6.60	279.10	3,362.08	-17.84	-296.52	296.52	0.59	-0.53	-2.32
3,475.00	6.60	284.40	3,456.45	-15.62	-307.20	307.20	0.64	0.00	5.58
3,570.00	7.30	283.00	3,550.75	-12.90	-318.37	318.37	0.76	0.74	-1.47
3,665.00	10.00	277.90	3,644.67	-10.41	-332.42	332.42	2.95	2.84	-5.37
3,760.00	8.00	274.70	3,738.49	-8.73	-347.18	347.18	2.17	-2.11	-3.37
3,855.00	6.00	272.90	3,832.78	-7.94	-358.73	358.73	2.12	-2.11	-1.89
3,951.00	6.50	271.50	3,928.21	-7.55	-369.17	369.17	0.54	0.52	-1.46
4,048.00	5.60	275.30	4,024.67	-6.96	-379.37	379.37	1.02	-0.93	3.92
4,144.00	4.40	270.40	4,120.30	-6.51	-387.72	387.72	1.33	-1.25	-5.10
4,239.00	4.10	271.60	4,215.04	-6.39	-394.76	394.76	0.33	-0.32	1.26
4,333.00	3.10	282.80	4,308.85	-5.73	-400.60	400.60	1.30	-1.06	11.91
4,428.00	1.00	307.80	4,403.79	-4.65	-403.76	403.76	2.35	-2.21	26.32
4,523.00	1.50	300.60	4,498.77	-3.51	-405.48	405.48	0.55	0.53	-7.58
4,619.00	2.10	303.20	4,594.72	-1.91	-408.04	408.04	0.63	0.63	2.71
4,714.00	2.50	298.20	4,689.64	0.02	-411.32	411.32	0.47	0.42	-5.26
4,810.00	1.00	338.00	4,785.60	1.79	-413.48	413.48	1.92	-1.56	41.46
4,906.00	0.10	325.80	4,881.59	2.64	-413.84	413.84	0.94	-0.94	-12.71
5,002.00	0.30	158.70	4,977.59	2.47	-413.79	413.79	0.41	0.21	-174.06
5,097.00	0.50	157.70	5,072.59	1.86	-413.55	413.55	0.21	0.21	-1.05
5,193.00	0.50	175.30	5,168.59	1.05	-413.35	413.35	0.16	0.00	18.33

# Phoenix Technology Services LP

## Planning Report



<b>Database:</b>	Compass 5000 RMR	<b>Local Co-ordinate Reference:</b>	Well NGL C-2C
<b>Company:</b>	NGL Water Solutions DJ LLC	<b>TVD Reference:</b>	RKB @ 5042.00usft (Savanna 802)
<b>Project:</b>	Weld County, CO (NAD83)	<b>MD Reference:</b>	RKB @ 5042.00usft (Savanna 802)
<b>Site:</b>	Sec28-T1N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	NGL C-2C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH / Job #60004		
<b>Design:</b>	Plan 4 03-21-16		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
5,287.00	0.30	177.40	5,262.58	0.40	-413.31	413.31	0.21	-0.21	2.23	
5,382.00	0.40	148.80	5,357.58	-0.14	-413.13	413.13	0.21	0.11	-30.11	
5,478.00	1.10	116.40	5,453.57	-0.83	-412.13	412.13	0.82	0.73	-33.75	
5,573.00	1.60	92.70	5,548.55	-1.30	-409.99	409.99	0.78	0.53	-24.95	
5,668.00	0.60	96.20	5,643.53	-1.42	-408.17	408.17	1.05	-1.05	3.68	
5,762.00	1.20	105.70	5,737.52	-1.74	-406.73	406.73	0.66	0.64	10.11	
5,858.00	3.40	94.60	5,833.43	-2.24	-402.92	402.92	2.33	2.29	-11.56	
5,952.00	2.30	94.00	5,927.32	-2.59	-398.26	398.26	1.17	-1.17	-0.64	
6,047.00	1.20	134.60	6,022.27	-3.42	-395.65	395.65	1.68	-1.16	42.74	
6,143.00	2.10	127.00	6,118.23	-5.19	-393.53	393.53	0.96	0.94	-7.92	
6,237.00	6.00	97.70	6,211.99	-6.88	-387.29	387.29	4.57	4.15	-31.17	
6,332.00	6.00	89.40	6,306.47	-7.50	-377.40	377.40	0.91	0.00	-8.74	
6,428.00	5.70	90.00	6,401.97	-7.44	-367.62	367.62	0.32	-0.31	0.63	
6,523.00	7.20	100.80	6,496.37	-8.56	-357.05	357.05	2.02	1.58	11.37	
6,619.00	5.30	96.10	6,591.79	-10.16	-346.73	346.73	2.05	-1.98	-4.90	
6,714.00	4.70	96.10	6,686.43	-11.04	-338.50	338.50	0.63	-0.63	0.00	
6,809.00	3.30	101.40	6,781.20	-11.99	-331.95	331.95	1.52	-1.47	5.58	
6,898.00	2.60	91.10	6,870.08	-12.54	-327.42	327.42	0.98	-0.79	-11.57	
6,994.00	2.20	90.70	6,966.00	-12.60	-323.40	323.40	0.42	-0.42	-0.42	
7,089.00	1.40	83.60	7,060.95	-12.49	-320.42	320.42	0.87	-0.84	-7.47	
7,185.00	0.70	66.20	7,156.93	-12.13	-318.72	318.72	0.79	-0.73	-18.13	
7,281.00	0.80	204.30	7,252.93	-12.50	-318.46	318.46	1.46	0.10	143.85	
7,376.00	1.90	234.80	7,347.90	-14.01	-320.02	320.02	1.34	1.16	32.11	
7,471.00	1.10	122.40	7,442.88	-15.41	-320.54	320.54	2.67	-0.84	-118.32	
7,566.00	1.30	110.60	7,537.86	-16.28	-318.76	318.76	0.33	0.21	-12.42	
Tie In										
7,600.00	1.30	110.60	7,571.85	-16.55	-318.03	318.03	0.00	0.00	0.00	
7,635.00	1.30	110.60	7,606.84	-16.83	-317.29	317.29	0.00	0.00	0.00	
PTB, Begin 3.50°/100' Drop & Turn										
7,672.14	0.00	110.60	7,643.98	-16.98	-316.90	316.90	3.50	-3.50	0.00	
Begin Vertical Hold										
7,700.00	0.00	0.00	7,671.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
7,800.00	0.00	0.00	7,771.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
7,900.00	0.00	0.00	7,871.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
8,000.00	0.00	0.00	7,971.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
8,100.00	0.00	0.00	8,071.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
8,200.00	0.00	0.00	8,171.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
8,300.00	0.00	0.00	8,271.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
8,400.00	0.00	0.00	8,371.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
8,500.00	0.00	0.00	8,471.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
8,600.00	0.00	0.00	8,571.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
8,700.00	0.00	0.00	8,671.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
8,800.00	0.00	0.00	8,771.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
8,900.00	0.00	0.00	8,871.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
9,000.00	0.00	0.00	8,971.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
9,100.00	0.00	0.00	9,071.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
9,200.00	0.00	0.00	9,171.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
9,300.00	0.00	0.00	9,271.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
9,339.16	0.00	0.00	9,311.00	-16.98	-316.90	316.90	0.00	0.00	0.00	
8-3/4										
9,400.00	0.00	0.00	9,371.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
9,500.00	0.00	0.00	9,471.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
9,600.00	0.00	0.00	9,571.84	-16.98	-316.90	316.90	0.00	0.00	0.00	

# Phoenix Technology Services LP

## Planning Report



<b>Database:</b>	Compass 5000 RMR	<b>Local Co-ordinate Reference:</b>	Well NGL C-2C
<b>Company:</b>	NGL Water Solutions DJ LLC	<b>TVD Reference:</b>	RKB @ 5042.00usft (Savanna 802)
<b>Project:</b>	Weld County, CO (NAD83)	<b>MD Reference:</b>	RKB @ 5042.00usft (Savanna 802)
<b>Site:</b>	Sec28-T1N-R67W	<b>North Reference:</b>	True
<b>Well:</b>	NGL C-2C	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	OH / Job #60004		
<b>Design:</b>	Plan 4 03-21-16		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
9,700.00	0.00	0.00	9,671.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
9,800.00	0.00	0.00	9,771.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
9,900.00	0.00	0.00	9,871.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
10,000.00	0.00	0.00	9,971.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
10,100.00	0.00	0.00	10,071.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
10,200.00	0.00	0.00	10,171.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
10,300.00	0.00	0.00	10,271.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
10,400.00	0.00	0.00	10,371.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
10,500.00	0.00	0.00	10,471.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
10,600.00	0.00	0.00	10,571.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
10,700.00	0.00	0.00	10,671.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
10,800.00	0.00	0.00	10,771.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
10,900.00	0.00	0.00	10,871.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
11,000.00	0.00	0.00	10,971.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
11,100.00	0.00	0.00	11,071.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
11,200.00	0.00	0.00	11,171.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
11,300.00	0.00	0.00	11,271.84	-16.98	-316.90	316.90	0.00	0.00	0.00	
11,330.16	0.00	0.00	11,302.00	-16.98	-316.90	316.90	0.00	0.00	0.00	
TD at 11330.16										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
- hit/miss target										
- Shape										
BHL-NGL C-2Cv4	0.00	0.00	11,302.00	-16.98	-316.90	1,249,292.784	3,168,706.403	40° 0' 58.04053 N	104° 53' 51.57756 W	
- plan misses target center by 0.01usft at 11330.16usft MD (11302.00 TVD, -16.98 N, -316.90 E)										
- Circle (radius 25.00)										

Casing Points									
Measured Depth (usft)	Vertical Depth (usft)	Name			Casing Diameter (")	Hole Diameter (")			
9,339.16	9,311.00	8-3/4			8-3/4	8-3/4			

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
7,566.00	7,537.86	-16.28	-318.76	Tie In	
7,635.00	7,606.84	-16.83	-317.29	PTB, Begin 3.50°/100' Drop & Turn	
7,672.14	7,643.98	-16.98	-316.90	Begin Vertical Hold	
11,330.16	11,302.00	-16.98	-316.90	TD at 11330.16	