



Caza Operating LLC

Igloo 19-24 State Fed Com 13H

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Survey: Igloo 19-24 State Fed Com 13H

Morcor Standard Plan

16 April, 2020

These surveys are true and accurate to the best of my knowledge.

A handwritten signature in black ink, appearing to read 'Steve Morris'.

Steve Morris

Company:	Caza Operating LLC				Local Co-ordinate Reference:	Well Igloo 19-24 State Fed Com 13H	
Project:	Igloo 19-24 State Fed Com 13H				TVD Reference:	WELL @ 3715.0usft (Original Well Elev)	
Site:	Igloo 19-24 State Fed Com 13H				MD Reference:	WELL @ 3715.0usft (Original Well Elev)	
Well:	Igloo 19-24 State Fed Com 13H				North Reference:	Grid	
Wellbore:	Igloo 19-24 State Fed Com 13H				Survey Calculation Method:	Minimum Curvature	
Design:	Igloo 19-24 State Fed Com 13H				Database:	EDM 5000.1 Single User Db	

Project	Igloo 19-24 State Fed Com 13H						
Map System:	US State Plane 1983			System Datum:	Mean Sea Level		
Geo Datum:	North American Datum 1983						
Map Zone:	New Mexico Eastern Zone						

Site	Igloo 19-24 State Fed Com 13H						
Site Position:			Northing:	566,956.82 usft	Latitude:	32° 33' 20.988 N	
From:	Lat/Long		Easting:	799,416.03 usft	Longitude:	103° 29' 44.556 W	
Position Uncertainty:	1.0 usft		Slot Radius:	17-1/2 "	Grid Convergence:	0.45 °	

Well	Igloo 19-24 State Fed Com 13H						
Well Position	+N/-S	0.0 usft	Northing:	566,956.82 usft	Latitude:	32° 33' 20.988 N	
	+E/-W	0.0 usft	Easting:	799,416.03 usft	Longitude:	103° 29' 44.556 W	
Position Uncertainty	1.0 usft		Wellhead Elevation:	usft	Ground Level:	3,693.0 usft	

Wellbore	Igloo 19-24 State Fed Com 13H						
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)		
	IGRF2010	10/21/2018	6.66	60.31	48,085		

Design	Igloo 19-24 State Fed Com 13H						
Audit Notes:							
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0		
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)			
	0.0	0.0	0.0	270.28			

Survey Program	Date	4/16/2020				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description		
100.0	18,913.0	Igloo 19-24 State Fed Com 13H (Igloo 19-	MWD	MWD - Standard		

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0.0	0.00	0.00	0.0	-3,715.0	0.0	0.0	799,416.03	566,956.82	0.00	0.00
100.0	0.07	119.54	100.0	-3,615.0	0.0	0.1	799,416.09	566,956.79	-0.05	0.07
125.0	0.06	126.05	125.0	-3,590.0	0.0	0.1	799,416.11	566,956.78	-0.08	0.05
150.0	0.05	134.66	150.0	-3,565.0	-0.1	0.1	799,416.13	566,956.76	-0.10	0.05
175.0	0.06	121.54	175.0	-3,540.0	-0.1	0.1	799,416.15	566,956.75	-0.11	0.06
200.0	0.07	179.62	200.0	-3,515.0	-0.1	0.1	799,416.16	566,956.72	-0.13	0.25
225.0	0.09	161.34	225.0	-3,490.0	-0.1	0.1	799,416.17	566,956.69	-0.13	0.13
250.0	0.09	175.13	250.0	-3,465.0	-0.2	0.1	799,416.17	566,956.65	-0.14	0.09
275.0	0.08	193.76	275.0	-3,440.0	-0.2	0.1	799,416.17	566,956.62	-0.14	0.12
300.0	0.10	177.76	300.0	-3,415.0	-0.2	0.1	799,416.17	566,956.58	-0.14	0.13
325.0	0.09	187.76	325.0	-3,390.0	-0.3	0.1	799,416.17	566,956.54	-0.13	0.08
350.0	0.15	196.38	350.0	-3,365.0	-0.3	0.1	799,416.15	566,956.49	-0.12	0.25
375.0	0.17	198.27	375.0	-3,340.0	-0.4	0.1	799,416.13	566,956.42	-0.10	0.08
400.0	0.18	200.14	400.0	-3,315.0	-0.5	0.1	799,416.11	566,956.35	-0.08	0.05
425.0	0.19	203.16	425.0	-3,290.0	-0.6	0.0	799,416.08	566,956.27	-0.05	0.06
450.0	0.16	194.78	450.0	-3,265.0	-0.6	0.0	799,416.05	566,956.20	-0.02	0.16
475.0	0.11	182.80	475.0	-3,240.0	-0.7	0.0	799,416.04	566,956.14	-0.01	0.23
500.0	0.13	197.05	500.0	-3,215.0	-0.7	0.0	799,416.03	566,956.09	0.00	0.14
525.0	0.12	183.35	525.0	-3,190.0	-0.8	0.0	799,416.02	566,956.04	0.01	0.13
550.0	0.18	173.69	550.0	-3,165.0	-0.8	0.0	799,416.03	566,955.97	0.00	0.26
575.0	0.20	180.18	575.0	-3,140.0	-0.9	0.0	799,416.03	566,955.89	0.00	0.12
600.0	0.21	183.26	600.0	-3,115.0	-1.0	0.0	799,416.03	566,955.80	0.00	0.06
625.0	0.23	192.36	625.0	-3,090.0	-1.1	0.0	799,416.01	566,955.71	0.01	0.16
650.0	0.22	193.90	650.0	-3,065.0	-1.2	0.0	799,415.99	566,955.61	0.04	0.05
675.0	0.26	200.05	675.0	-3,040.0	-1.3	-0.1	799,415.96	566,955.51	0.07	0.19
700.0	0.30	203.53	700.0	-3,015.0	-1.4	-0.1	799,415.92	566,955.40	0.11	0.17
725.0	0.30	212.42	725.0	-2,990.0	-1.5	-0.2	799,415.85	566,955.28	0.17	0.19

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Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
750.0	0.33	214.36	750.0	-2,965.0	-1.7	-0.3	799,415.78	566,955.17	0.25	0.13
775.0	0.34	224.07	775.0	-2,940.0	-1.8	-0.3	799,415.69	566,955.05	0.34	0.23
800.0	0.31	218.41	800.0	-2,915.0	-1.9	-0.4	799,415.59	566,954.95	0.43	0.18
825.0	0.31	213.67	825.0	-2,890.0	-2.0	-0.5	799,415.51	566,954.84	0.51	0.10
850.0	0.30	210.70	850.0	-2,865.0	-2.1	-0.6	799,415.44	566,954.73	0.58	0.07
875.0	0.29	220.87	875.0	-2,840.0	-2.2	-0.7	799,415.37	566,954.62	0.66	0.21
900.0	0.28	219.06	900.0	-2,815.0	-2.3	-0.7	799,415.29	566,954.53	0.73	0.05
925.0	0.24	215.19	925.0	-2,790.0	-2.4	-0.8	799,415.22	566,954.44	0.80	0.17
950.0	0.27	219.23	950.0	-2,765.0	-2.5	-0.9	799,415.15	566,954.35	0.87	0.14
975.0	0.31	209.17	975.0	-2,740.0	-2.6	-1.0	799,415.08	566,954.24	0.94	0.26
1,000.0	0.34	198.43	1,000.0	-2,715.0	-2.7	-1.0	799,415.03	566,954.11	1.00	0.27
1,025.0	0.31	201.45	1,025.0	-2,690.0	-2.8	-1.1	799,414.98	566,953.98	1.04	0.14
1,050.0	0.36	205.70	1,050.0	-2,665.0	-3.0	-1.1	799,414.92	566,953.85	1.10	0.22
1,075.0	0.38	202.25	1,075.0	-2,640.0	-3.1	-1.2	799,414.85	566,953.70	1.17	0.12
1,100.0	0.36	199.59	1,100.0	-2,615.0	-3.3	-1.2	799,414.80	566,953.55	1.22	0.11
1,125.0	0.39	211.21	1,125.0	-2,590.0	-3.4	-1.3	799,414.72	566,953.40	1.29	0.33
1,150.0	0.37	215.43	1,150.0	-2,565.0	-3.6	-1.4	799,414.63	566,953.26	1.38	0.14
1,175.0	0.37	211.64	1,175.0	-2,540.0	-3.7	-1.5	799,414.54	566,953.13	1.47	0.10
1,200.0	0.41	214.70	1,200.0	-2,515.0	-3.8	-1.6	799,414.45	566,952.99	1.56	0.18
1,225.0	0.42	224.80	1,225.0	-2,490.0	-4.0	-1.7	799,414.34	566,952.85	1.68	0.29
1,250.0	0.44	229.07	1,250.0	-2,465.0	-4.1	-1.8	799,414.20	566,952.72	1.81	0.15
1,275.0	0.39	221.50	1,275.0	-2,440.0	-4.2	-2.0	799,414.07	566,952.59	1.94	0.30
1,300.0	0.39	222.31	1,300.0	-2,415.0	-4.4	-2.1	799,413.96	566,952.47	2.06	0.02
1,325.0	0.42	211.46	1,325.0	-2,390.0	-4.5	-2.2	799,413.85	566,952.33	2.16	0.33
1,350.0	0.45	210.94	1,350.0	-2,365.0	-4.7	-2.3	799,413.75	566,952.16	2.26	0.12
1,375.0	0.46	216.46	1,375.0	-2,340.0	-4.8	-2.4	799,413.64	566,952.00	2.37	0.18
1,400.0	0.47	217.53	1,400.0	-2,315.0	-5.0	-2.5	799,413.52	566,951.84	2.49	0.05

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Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
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Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
1,425.0	0.50	227.91	1,425.0	-2,290.0	-5.1	-2.7	799,413.38	566,951.68	2.63	0.37	
1,450.0	0.51	234.10	1,450.0	-2,265.0	-5.3	-2.8	799,413.21	566,951.54	2.80	0.22	
1,475.0	0.47	237.25	1,475.0	-2,240.0	-5.4	-3.0	799,413.03	566,951.42	2.98	0.19	
1,500.0	0.53	240.21	1,500.0	-2,215.0	-5.5	-3.2	799,412.84	566,951.31	3.16	0.26	
1,525.0	0.48	237.11	1,525.0	-2,190.0	-5.6	-3.4	799,412.66	566,951.20	3.35	0.23	
1,550.0	0.54	241.16	1,550.0	-2,165.0	-5.7	-3.6	799,412.46	566,951.08	3.54	0.28	
1,575.0	0.56	239.87	1,575.0	-2,140.0	-5.9	-3.8	799,412.26	566,950.96	3.75	0.09	
1,600.0	0.56	243.01	1,600.0	-2,115.0	-6.0	-4.0	799,412.04	566,950.85	3.96	0.12	
1,625.0	0.56	243.58	1,625.0	-2,090.0	-6.1	-4.2	799,411.82	566,950.74	4.18	0.02	
1,650.0	0.58	234.48	1,650.0	-2,065.0	-6.2	-4.4	799,411.61	566,950.61	4.39	0.37	
1,675.0	0.65	245.69	1,675.0	-2,040.0	-6.3	-4.7	799,411.38	566,950.48	4.63	0.56	
1,700.0	0.67	244.83	1,700.0	-2,015.0	-6.5	-4.9	799,411.12	566,950.36	4.89	0.09	
1,725.0	0.72	245.53	1,725.0	-1,990.0	-6.6	-5.2	799,410.84	566,950.23	5.16	0.20	
1,750.0	0.77	247.78	1,750.0	-1,965.0	-6.7	-5.5	799,410.54	566,950.10	5.46	0.23	
1,775.0	0.79	247.24	1,775.0	-1,940.0	-6.9	-5.8	799,410.23	566,949.97	5.77	0.09	
1,800.0	0.75	246.84	1,800.0	-1,915.0	-7.0	-6.1	799,409.92	566,949.84	6.08	0.16	
1,825.0	0.74	245.01	1,825.0	-1,890.0	-7.1	-6.4	799,409.62	566,949.71	6.38	0.10	
1,850.0	0.76	246.23	1,850.0	-1,865.0	-7.2	-6.7	799,409.32	566,949.57	6.67	0.10	
1,875.0	0.71	247.67	1,875.0	-1,840.0	-7.4	-7.0	799,409.03	566,949.45	6.97	0.21	
1,900.0	0.72	240.78	1,900.0	-1,815.0	-7.5	-7.3	799,408.75	566,949.31	7.25	0.35	
1,925.0	0.72	243.46	1,925.0	-1,790.0	-7.7	-7.6	799,408.47	566,949.16	7.53	0.13	
1,950.0	0.76	241.42	1,949.9	-1,765.1	-7.8	-7.8	799,408.18	566,949.01	7.81	0.19	
1,975.0	0.73	240.95	1,974.9	-1,740.1	-8.0	-8.1	799,407.90	566,948.86	8.10	0.12	
2,000.0	0.60	245.90	1,999.9	-1,715.1	-8.1	-8.4	799,407.64	566,948.73	8.35	0.57	
2,025.0	0.23	252.71	2,024.9	-1,690.1	-8.2	-8.6	799,407.47	566,948.66	8.52	1.49	
2,050.0	0.21	273.89	2,049.9	-1,665.1	-8.2	-8.7	799,407.38	566,948.65	8.61	0.33	
2,075.0	0.18	263.14	2,074.9	-1,640.1	-8.2	-8.7	799,407.30	566,948.65	8.70	0.19	

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2,100.0	0.22	263.24	2,099.9	-1,615.1	-8.2	-8.8	799,407.21	566,948.64	8.79	0.16	
2,125.0	0.26	268.66	2,124.9	-1,590.1	-8.2	-8.9	799,407.10	566,948.63	8.89	0.18	
2,150.0	0.27	271.63	2,149.9	-1,565.1	-8.2	-9.0	799,406.99	566,948.63	9.01	0.07	
2,175.0	0.27	270.37	2,174.9	-1,540.1	-8.2	-9.2	799,406.87	566,948.63	9.12	0.02	
2,200.0	0.33	277.64	2,199.9	-1,515.1	-8.2	-9.3	799,406.74	566,948.64	9.25	0.28	
2,225.0	0.26	279.27	2,224.9	-1,490.1	-8.2	-9.4	799,406.61	566,948.66	9.38	0.28	
2,250.0	0.26	280.55	2,249.9	-1,465.1	-8.1	-9.5	799,406.50	566,948.68	9.49	0.02	
2,275.0	0.24	280.19	2,274.9	-1,440.1	-8.1	-9.6	799,406.39	566,948.70	9.60	0.08	
2,300.0	0.20	287.58	2,299.9	-1,415.1	-8.1	-9.7	799,406.30	566,948.72	9.69	0.20	
2,325.0	0.22	272.82	2,324.9	-1,390.1	-8.1	-9.8	799,406.21	566,948.74	9.78	0.23	
2,350.0	0.24	261.18	2,349.9	-1,365.1	-8.1	-9.9	799,406.11	566,948.73	9.88	0.20	
2,375.0	0.23	268.60	2,374.9	-1,340.1	-8.1	-10.0	799,406.01	566,948.72	9.98	0.13	
2,400.0	0.23	265.37	2,399.9	-1,315.1	-8.1	-10.1	799,405.91	566,948.72	10.08	0.05	
2,425.0	0.16	265.25	2,424.9	-1,290.1	-8.1	-10.2	799,405.83	566,948.71	10.17	0.28	
2,450.0	0.19	278.23	2,449.9	-1,265.1	-8.1	-10.3	799,405.75	566,948.71	10.24	0.20	
2,475.0	0.17	271.90	2,474.9	-1,240.1	-8.1	-10.4	799,405.67	566,948.72	10.32	0.11	
2,500.0	0.18	279.93	2,499.9	-1,215.1	-8.1	-10.4	799,405.60	566,948.73	10.40	0.11	
2,525.0	0.14	313.62	2,524.9	-1,190.1	-8.1	-10.5	799,405.53	566,948.76	10.46	0.40	
2,550.0	0.14	332.34	2,549.9	-1,165.1	-8.0	-10.5	799,405.50	566,948.80	10.50	0.18	
2,575.0	0.17	340.10	2,574.9	-1,140.1	-8.0	-10.6	799,405.47	566,948.87	10.52	0.15	
2,600.0	0.17	354.58	2,599.9	-1,115.1	-7.9	-10.6	799,405.46	566,948.94	10.54	0.17	
2,625.0	0.25	353.25	2,624.9	-1,090.1	-7.8	-10.6	799,405.45	566,949.03	10.55	0.32	
2,650.0	0.25	5.57	2,649.9	-1,065.1	-7.7	-10.6	799,405.44	566,949.14	10.55	0.21	
2,675.0	0.26	16.54	2,674.9	-1,040.1	-7.6	-10.6	799,405.47	566,949.25	10.53	0.20	
2,700.0	0.19	15.83	2,699.9	-1,015.1	-7.5	-10.5	799,405.49	566,949.34	10.50	0.28	
2,725.0	0.20	20.45	2,724.9	-990.1	-7.4	-10.5	799,405.52	566,949.42	10.48	0.07	
2,750.0	0.23	28.00	2,749.9	-965.1	-7.3	-10.5	799,405.56	566,949.51	10.44	0.16	

Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Igloo 19-24 State Fed Com 13H
Project:	Igloo 19-24 State Fed Com 13H	TVD Reference:	WELL @ 3715.0usft (Original Well Elev)
Site:	Igloo 19-24 State Fed Com 13H	MD Reference:	WELL @ 3715.0usft (Original Well Elev)
Well:	Igloo 19-24 State Fed Com 13H	North Reference:	Grid
Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
Design:	Igloo 19-24 State Fed Com 13H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
2,775.0	0.17	14.31	2,774.9	-940.1	-7.2	-10.4	799,405.59	566,949.59	10.41	0.31	
2,800.0	0.23	359.27	2,799.9	-915.1	-7.1	-10.4	799,405.60	566,949.67	10.40	0.32	
2,825.0	0.27	0.74	2,824.9	-890.1	-7.0	-10.4	799,405.60	566,949.78	10.40	0.16	
2,850.0	0.28	10.42	2,849.9	-865.1	-6.9	-10.4	799,405.61	566,949.90	10.39	0.19	
2,875.0	0.40	32.21	2,874.9	-840.1	-6.8	-10.4	799,405.67	566,950.03	10.33	0.70	
2,900.0	0.59	44.48	2,899.9	-815.1	-6.6	-10.2	799,405.81	566,950.20	10.20	0.87	
2,925.0	0.86	46.88	2,924.9	-790.1	-6.4	-10.0	799,406.03	566,950.42	9.97	1.09	
2,950.0	0.91	47.24	2,949.9	-765.1	-6.1	-9.7	799,406.32	566,950.68	9.69	0.20	
2,975.0	0.98	46.58	2,974.9	-740.1	-5.9	-9.4	799,406.62	566,950.96	9.39	0.28	
3,000.0	1.33	56.84	2,999.9	-715.1	-5.6	-9.0	799,407.02	566,951.27	8.99	1.62	
3,025.0	1.77	64.11	3,024.9	-690.1	-5.2	-8.4	799,407.61	566,951.60	8.40	1.92	
3,050.0	1.92	62.25	3,049.9	-665.1	-4.9	-7.7	799,408.32	566,951.96	7.69	0.65	
3,075.0	2.19	65.56	3,074.9	-640.1	-4.5	-6.9	799,409.13	566,952.35	6.88	1.18	
3,100.0	2.36	67.54	3,099.9	-615.1	-4.1	-6.0	799,410.04	566,952.75	5.97	0.75	
3,125.0	2.59	68.76	3,124.8	-590.2	-3.7	-5.0	799,411.04	566,953.15	4.97	0.94	
3,150.0	2.97	66.64	3,149.8	-565.2	-3.2	-3.9	799,412.16	566,953.61	3.86	1.57	
3,175.0	3.18	67.75	3,174.8	-540.2	-2.7	-2.6	799,413.40	566,954.13	2.62	0.87	
3,200.0	3.20	68.60	3,199.7	-515.3	-2.2	-1.3	799,414.69	566,954.65	1.33	0.21	
3,225.0	3.20	69.07	3,224.7	-490.3	-1.7	0.0	799,415.99	566,955.15	0.03	0.10	
3,250.0	3.27	66.26	3,249.7	-465.3	-1.1	1.3	799,417.30	566,955.69	-1.27	0.69	
3,275.0	3.57	64.51	3,274.6	-440.4	-0.5	2.6	799,418.65	566,956.31	-2.62	1.27	
3,300.0	3.67	64.19	3,299.6	-415.4	0.2	4.0	799,420.07	566,956.99	-4.04	0.41	
3,325.0	3.72	64.57	3,324.5	-390.5	0.9	5.5	799,421.53	566,957.69	-5.49	0.22	
3,350.0	3.72	65.03	3,349.5	-365.5	1.6	7.0	799,422.99	566,958.38	-6.95	0.12	
3,375.0	3.86	64.77	3,374.4	-340.6	2.3	8.5	799,424.49	566,959.08	-8.45	0.56	
3,400.0	4.20	62.43	3,399.3	-315.7	3.0	10.0	799,426.06	566,959.86	-10.02	1.51	
3,425.0	4.41	61.61	3,424.3	-290.7	3.9	11.7	799,427.72	566,960.74	-11.67	0.88	

Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Igloo 19-24 State Fed Com 13H
Project:	Igloo 19-24 State Fed Com 13H	TVD Reference:	WELL @ 3715.0usft (Original Well Elev)
Site:	Igloo 19-24 State Fed Com 13H	MD Reference:	WELL @ 3715.0usft (Original Well Elev)
Well:	Igloo 19-24 State Fed Com 13H	North Reference:	Grid
Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
Design:	Igloo 19-24 State Fed Com 13H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
3,450.0	4.54	60.85	3,449.2	-265.8	4.9	13.4	799,429.43	566,961.68	-13.37	0.57	
3,475.0	4.55	61.72	3,474.1	-240.9	5.8	15.1	799,431.17	566,962.63	-15.11	0.28	
3,500.0	4.65	61.69	3,499.0	-216.0	6.8	16.9	799,432.93	566,963.59	-16.87	0.40	
3,525.0	4.74	60.83	3,524.0	-191.0	7.7	18.7	799,434.73	566,964.57	-18.66	0.46	
3,550.0	4.87	60.84	3,548.9	-166.1	8.8	20.5	799,436.56	566,965.59	-20.48	0.52	
3,575.0	4.95	61.06	3,573.8	-141.2	9.8	22.4	799,438.43	566,966.63	-22.34	0.33	
3,600.0	5.10	59.35	3,598.7	-116.3	10.9	24.3	799,440.33	566,967.72	-24.24	0.85	
3,625.0	5.29	56.38	3,623.6	-91.4	12.1	26.2	799,442.24	566,968.92	-26.15	1.32	
3,650.0	5.53	53.53	3,648.5	-66.5	13.5	28.1	799,444.17	566,970.28	-28.07	1.44	
3,675.0	5.69	51.84	3,673.3	-41.7	14.9	30.1	799,446.11	566,971.76	-30.01	0.92	
3,700.0	5.92	49.89	3,698.2	-16.8	16.5	32.0	799,448.07	566,973.35	-31.96	1.21	
3,725.0	6.16	48.87	3,723.1	8.1	18.2	34.0	799,450.07	566,975.07	-33.95	1.05	
3,750.0	6.39	48.36	3,747.9	32.9	20.1	36.1	799,452.12	566,976.87	-35.99	0.95	
3,775.0	6.56	47.72	3,772.8	57.8	21.9	38.2	799,454.22	566,978.76	-38.08	0.74	
3,800.0	6.67	47.36	3,797.6	82.6	23.9	40.3	799,456.34	566,980.70	-40.19	0.47	
3,825.0	6.80	47.29	3,822.4	107.4	25.9	42.5	799,458.50	566,982.69	-42.34	0.52	
3,850.0	6.82	47.03	3,847.3	132.3	27.9	44.6	799,460.67	566,984.71	-44.50	0.15	
3,875.0	6.90	46.87	3,872.1	157.1	29.9	46.8	799,462.85	566,986.74	-46.67	0.33	
3,900.0	6.97	47.10	3,896.9	181.9	32.0	49.0	799,465.06	566,988.80	-48.87	0.30	
3,925.0	7.05	46.94	3,921.7	206.7	34.1	51.3	799,467.29	566,990.88	-51.09	0.33	
3,950.0	7.09	46.22	3,946.5	231.5	36.2	53.5	799,469.53	566,993.00	-53.32	0.39	
3,975.0	7.05	45.98	3,971.3	256.3	38.3	55.7	799,471.74	566,995.13	-55.52	0.20	
4,000.0	7.05	46.15	3,996.1	281.1	40.4	57.9	799,473.95	566,997.26	-57.72	0.08	
4,025.0	6.91	45.69	4,021.0	306.0	42.6	60.1	799,476.14	566,999.37	-59.89	0.60	
4,050.0	6.91	44.98	4,045.8	330.8	44.7	62.2	799,478.28	567,001.49	-62.02	0.34	
4,075.0	6.89	45.33	4,070.6	355.6	46.8	64.4	799,480.41	567,003.61	-64.14	0.19	
4,100.0	6.78	45.91	4,095.4	380.4	48.9	66.5	799,482.53	567,005.69	-66.26	0.52	

Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Igloo 19-24 State Fed Com 13H
Project:	Igloo 19-24 State Fed Com 13H	TVD Reference:	WELL @ 3715.0usft (Original Well Elev)
Site:	Igloo 19-24 State Fed Com 13H	MD Reference:	WELL @ 3715.0usft (Original Well Elev)
Well:	Igloo 19-24 State Fed Com 13H	North Reference:	Grid
Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
Design:	Igloo 19-24 State Fed Com 13H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
4,125.0	6.59	46.36	4,120.2	405.2	50.9	68.6	799,484.63	567,007.70	-68.35	0.79	
4,150.0	6.35	45.33	4,145.1	430.1	52.8	70.6	799,486.65	567,009.67	-70.36	1.07	
4,175.0	6.29	44.32	4,169.9	454.9	54.8	72.6	799,488.59	567,011.62	-72.29	0.51	
4,200.0	6.09	43.23	4,194.8	479.8	56.7	74.4	799,490.46	567,013.56	-74.14	0.93	
4,225.0	6.12	43.57	4,219.6	504.6	58.7	76.2	799,492.28	567,015.50	-75.96	0.19	
4,250.0	6.16	44.60	4,244.5	529.5	60.6	78.1	799,494.14	567,017.42	-77.81	0.47	
4,275.0	6.24	44.56	4,269.4	554.4	62.5	80.0	799,496.04	567,019.34	-79.70	0.32	
4,300.0	6.35	44.03	4,294.2	579.2	64.5	81.9	799,497.95	567,021.30	-81.60	0.50	
4,325.0	6.41	45.21	4,319.0	604.0	66.5	83.9	799,499.90	567,023.28	-83.54	0.58	
4,350.0	6.38	45.36	4,343.9	628.9	68.4	85.8	799,501.88	567,025.24	-85.51	0.14	
4,375.0	6.37	46.02	4,368.7	653.7	70.4	87.8	799,503.87	567,027.18	-87.49	0.30	
4,400.0	6.41	45.97	4,393.6	678.6	72.3	89.8	799,505.87	567,029.11	-89.48	0.16	
4,425.0	6.35	46.44	4,418.4	703.4	74.2	91.8	799,507.88	567,031.03	-91.48	0.32	
4,450.0	6.27	47.85	4,443.3	728.3	76.1	93.9	799,509.89	567,032.90	-93.48	0.70	
4,475.0	6.19	47.93	4,468.1	753.1	77.9	95.9	799,511.90	567,034.72	-95.49	0.32	
4,500.0	6.11	48.18	4,493.0	778.0	79.7	97.9	799,513.89	567,036.51	-97.47	0.34	
4,525.0	5.93	49.89	4,517.8	802.8	81.4	99.8	799,515.87	567,038.23	-99.44	1.02	
4,550.0	5.89	50.86	4,542.7	827.7	83.1	101.8	799,517.86	567,039.87	-101.41	0.43	
4,575.0	5.80	51.54	4,567.6	852.6	84.6	103.8	799,519.84	567,041.47	-103.39	0.45	
4,600.0	5.69	51.62	4,592.5	877.5	86.2	105.8	799,521.80	567,043.02	-105.34	0.44	
4,625.0	5.64	52.58	4,617.3	902.3	87.7	107.7	799,523.75	567,044.54	-107.28	0.43	
4,650.0	5.62	53.22	4,642.2	927.2	89.2	109.7	799,525.70	567,046.02	-109.23	0.26	
4,675.0	5.65	54.35	4,667.1	952.1	90.6	111.7	799,527.68	567,047.47	-111.21	0.46	
4,700.0	5.63	54.21	4,692.0	977.0	92.1	113.6	799,529.68	567,048.90	-113.19	0.10	
4,725.0	5.49	53.53	4,716.9	1,001.9	93.5	115.6	799,531.64	567,050.33	-115.14	0.62	
4,750.0	5.37	53.55	4,741.7	1,026.7	94.9	117.5	799,533.54	567,051.74	-117.04	0.48	
4,775.0	5.36	54.13	4,766.6	1,051.6	96.3	119.4	799,535.43	567,053.12	-118.92	0.22	

Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Igloo 19-24 State Fed Com 13H
Project:	Igloo 19-24 State Fed Com 13H	TVD Reference:	WELL @ 3715.0usft (Original Well Elev)
Site:	Igloo 19-24 State Fed Com 13H	MD Reference:	WELL @ 3715.0usft (Original Well Elev)
Well:	Igloo 19-24 State Fed Com 13H	North Reference:	Grid
Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
Design:	Igloo 19-24 State Fed Com 13H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
4,800.0	5.31	54.70	4,791.5	1,076.5	97.6	121.3	799,537.32	567,054.47	-120.80	0.29	
4,825.0	5.39	56.33	4,816.4	1,101.4	99.0	123.2	799,539.24	567,055.79	-122.72	0.69	
4,850.0	5.44	55.75	4,841.3	1,126.3	100.3	125.2	799,541.19	567,057.11	-124.67	0.30	
4,875.0	5.47	56.34	4,866.2	1,151.2	101.6	127.1	799,543.17	567,058.43	-126.63	0.25	
4,900.0	5.39	56.97	4,891.1	1,176.1	102.9	129.1	799,545.14	567,059.73	-128.60	0.40	
4,925.0	5.27	56.41	4,916.0	1,201.0	104.2	131.0	799,547.08	567,061.01	-130.54	0.52	
4,950.0	5.24	56.45	4,940.9	1,225.9	105.5	133.0	799,548.99	567,062.27	-132.44	0.12	
4,975.0	5.21	57.23	4,965.8	1,250.8	106.7	134.9	799,550.90	567,063.52	-134.34	0.31	
5,000.0	5.20	57.66	4,990.7	1,275.7	107.9	136.8	799,552.81	567,064.74	-136.24	0.16	
5,025.0	5.27	58.35	5,015.6	1,300.6	109.1	138.7	799,554.74	567,065.95	-138.17	0.38	
5,050.0	5.26	58.59	5,040.4	1,325.4	110.3	140.7	799,556.70	567,067.15	-140.12	0.10	
5,075.0	5.25	58.51	5,065.3	1,350.3	111.5	142.6	799,558.65	567,068.34	-142.07	0.05	
5,100.0	5.22	59.48	5,090.2	1,375.2	112.7	144.6	799,560.61	567,069.52	-144.02	0.37	
5,125.0	5.16	60.16	5,115.1	1,400.1	113.8	146.5	799,562.56	567,070.66	-145.97	0.34	
5,150.0	5.07	60.08	5,140.0	1,425.0	114.9	148.5	799,564.49	567,071.77	-147.90	0.36	
5,175.0	5.09	61.54	5,164.9	1,449.9	116.0	150.4	799,566.43	567,072.85	-149.82	0.52	
5,178.0	5.10	61.72	5,167.9	1,452.9	116.1	150.6	799,566.66	567,072.97	-150.06	0.63	
5,297.0	5.07	57.83	5,286.5	1,571.5	121.5	159.7	799,575.77	567,078.28	-159.14	0.29	
5,391.0	4.20	53.74	5,380.2	1,665.2	125.7	166.0	799,582.06	567,082.52	-165.41	0.99	
5,486.0	1.74	32.44	5,475.0	1,760.0	129.0	169.6	799,585.64	567,085.80	-168.97	2.79	
5,581.0	0.83	334.65	5,570.0	1,855.0	130.8	170.1	799,586.12	567,087.64	-169.44	1.55	
5,675.0	0.76	335.46	5,664.0	1,949.0	132.0	169.5	799,585.57	567,088.82	-168.89	0.08	
5,769.0	0.87	354.91	5,758.0	2,043.0	133.3	169.2	799,585.25	567,090.10	-168.56	0.31	
5,863.0	0.79	353.20	5,852.0	2,137.0	134.6	169.1	799,585.11	567,091.45	-168.41	0.09	
5,958.0	0.85	326.08	5,947.0	2,232.0	135.9	168.6	799,584.64	567,092.69	-167.94	0.41	
6,052.0	0.96	328.11	6,040.9	2,325.9	137.1	167.8	799,583.83	567,093.94	-167.12	0.12	
6,146.0	0.04	359.92	6,134.9	2,419.9	137.8	167.4	799,583.41	567,094.64	-166.70	0.99	

Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Igloo 19-24 State Fed Com 13H
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Site:	Igloo 19-24 State Fed Com 13H	MD Reference:	WELL @ 3715.0usft (Original Well Elev)
Well:	Igloo 19-24 State Fed Com 13H	North Reference:	Grid
Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
Design:	Igloo 19-24 State Fed Com 13H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
6,240.0	0.52	141.10	6,228.9	2,513.9	137.5	167.6	799,583.68	567,094.34	-166.97	0.59	
6,335.0	0.55	153.11	6,323.9	2,608.9	136.8	168.1	799,584.16	567,093.60	-167.45	0.12	
6,429.0	0.52	149.28	6,417.9	2,702.9	136.0	168.5	799,584.58	567,092.83	-167.88	0.05	
6,523.0	0.54	140.53	6,511.9	2,796.9	135.3	169.0	799,585.08	567,092.12	-168.38	0.09	
6,618.0	0.49	133.37	6,606.9	2,891.9	134.7	169.6	799,585.66	567,091.49	-168.97	0.09	
6,711.0	0.19	106.03	6,699.9	2,984.9	134.4	170.1	799,586.10	567,091.18	-169.40	0.36	
6,806.0	0.18	106.09	6,794.9	3,079.9	134.3	170.4	799,586.39	567,091.09	-169.70	0.01	
6,902.0	0.09	165.05	6,890.9	3,175.9	134.2	170.5	799,586.56	567,090.98	-169.87	0.16	
6,996.0	0.06	344.62	6,984.9	3,269.9	134.1	170.5	799,586.56	567,090.96	-169.87	0.16	
7,091.0	0.10	287.06	7,079.9	3,364.9	134.2	170.4	799,586.47	567,091.03	-169.78	0.09	
7,186.0	0.32	181.20	7,174.9	3,459.9	134.0	170.4	799,586.39	567,090.79	-169.69	0.38	
7,280.0	0.36	175.02	7,268.9	3,553.9	133.4	170.4	799,586.41	567,090.23	-169.72	0.06	
7,374.0	0.29	178.75	7,362.9	3,647.9	132.9	170.4	799,586.44	567,089.70	-169.75	0.08	
7,469.0	0.38	182.66	7,457.9	3,742.9	132.3	170.4	799,586.43	567,089.14	-169.74	0.10	
7,562.0	0.64	181.30	7,550.9	3,835.9	131.5	170.4	799,586.40	567,088.32	-169.72	0.28	
7,656.0	0.38	189.97	7,644.9	3,929.9	130.7	170.3	799,586.34	567,087.48	-169.66	0.29	
7,751.0	0.60	164.11	7,739.9	4,024.9	129.9	170.4	799,586.42	567,086.69	-169.75	0.32	
7,844.0	0.48	157.20	7,832.9	4,117.9	129.0	170.7	799,586.70	567,085.87	-170.03	0.15	
7,939.0	0.25	163.66	7,927.9	4,212.9	128.5	170.9	799,586.91	567,085.30	-170.25	0.25	
8,034.0	0.48	202.52	8,022.9	4,307.9	127.9	170.8	799,586.82	567,084.74	-170.16	0.34	
8,128.0	0.44	207.80	8,116.9	4,401.9	127.2	170.5	799,586.50	567,084.05	-169.84	0.06	
8,220.0	0.48	217.22	8,208.9	4,493.9	126.6	170.1	799,586.10	567,083.43	-169.45	0.09	
8,315.0	0.25	198.98	8,303.9	4,588.9	126.1	169.8	799,585.79	567,082.92	-169.14	0.27	
8,410.0	0.39	235.47	8,398.9	4,683.9	125.7	169.4	799,585.46	567,082.54	-168.81	0.25	
8,503.0	0.29	220.18	8,491.9	4,776.9	125.4	169.0	799,585.05	567,082.18	-168.40	0.14	
8,598.0	0.35	209.00	8,586.9	4,871.9	124.9	168.7	799,584.75	567,081.74	-168.11	0.09	
8,692.0	0.45	250.05	8,680.9	4,965.9	124.5	168.2	799,584.27	567,081.37	-167.62	0.31	

Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Igloo 19-24 State Fed Com 13H
Project:	Igloo 19-24 State Fed Com 13H	TVD Reference:	WELL @ 3715.0usft (Original Well Elev)
Site:	Igloo 19-24 State Fed Com 13H	MD Reference:	WELL @ 3715.0usft (Original Well Elev)
Well:	Igloo 19-24 State Fed Com 13H	North Reference:	Grid
Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
Design:	Igloo 19-24 State Fed Com 13H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
8,786.0	0.27	277.36	8,774.9	5,059.9	124.4	167.7	799,583.70	567,081.27	-167.06	0.26	
8,880.0	0.31	278.03	8,868.9	5,153.9	124.5	167.2	799,583.23	567,081.33	-166.58	0.04	
8,974.0	0.58	279.57	8,962.9	5,247.9	124.6	166.5	799,582.51	567,081.45	-165.86	0.29	
9,069.0	0.61	249.48	9,057.9	5,342.9	124.5	165.5	799,581.56	567,081.35	-164.91	0.33	
9,163.0	0.56	242.31	9,151.9	5,436.9	124.1	164.6	799,580.68	567,080.96	-164.04	0.09	
9,257.0	0.40	220.87	9,245.9	5,530.9	123.7	164.0	799,580.06	567,080.50	-163.42	0.25	
9,351.0	0.15	262.52	9,339.9	5,624.9	123.4	163.7	799,579.73	567,080.24	-163.09	0.32	
9,446.0	0.24	210.75	9,434.9	5,719.9	123.2	163.5	799,579.50	567,080.05	-162.86	0.20	
9,541.0	0.24	139.77	9,529.9	5,814.9	122.9	163.5	799,579.53	567,079.73	-162.89	0.29	
9,635.0	0.50	134.94	9,623.9	5,908.9	122.5	163.9	799,579.94	567,079.29	-163.31	0.28	
9,730.0	0.34	118.95	9,718.9	6,003.9	122.0	164.5	799,580.48	567,078.86	-163.85	0.21	
9,824.0	0.71	146.81	9,812.9	6,097.9	121.4	165.0	799,581.05	567,078.23	-164.42	0.47	
9,918.0	0.75	152.09	9,906.8	6,191.8	120.4	165.6	799,581.65	567,077.20	-165.03	0.08	
10,011.0	1.07	160.71	9,999.8	6,284.8	119.0	166.2	799,582.23	567,075.85	-165.61	0.37	
10,105.0	1.12	170.45	10,093.8	6,378.8	117.3	166.6	799,582.67	567,074.11	-166.06	0.20	
10,199.0	1.08	191.61	10,187.8	6,472.8	115.5	166.6	799,582.64	567,072.34	-166.04	0.43	
10,265.0	1.19	192.17	10,253.8	6,538.8	114.2	166.3	799,582.37	567,071.06	-165.78	0.17	
10,313.0	5.41	252.70	10,301.7	6,586.7	113.1	164.1	799,580.11	567,069.90	-163.52	10.28	
10,360.0	13.46	264.52	10,348.0	6,633.0	111.9	156.5	799,572.53	567,068.71	-155.95	17.53	
10,407.0	21.08	267.58	10,392.9	6,677.9	111.0	142.6	799,558.62	567,067.83	-142.04	16.32	
10,454.0	27.43	264.91	10,435.7	6,720.7	109.7	123.3	799,539.37	567,066.52	-122.80	13.71	
10,500.0	32.40	265.28	10,475.6	6,760.6	107.7	100.5	799,516.52	567,064.56	-99.96	10.81	
10,547.0	34.84	266.61	10,514.7	6,799.7	105.9	74.5	799,490.57	567,062.73	-74.02	5.42	
10,594.0	40.28	270.09	10,552.0	6,837.0	105.1	45.9	799,461.95	567,061.96	-45.40	12.42	
10,641.0	41.77	270.75	10,587.4	6,872.4	105.4	15.1	799,431.10	567,062.19	-14.55	3.30	
10,689.0	42.77	270.26	10,622.9	6,907.9	105.6	-17.2	799,398.82	567,062.47	17.73	2.19	
10,736.0	43.54	270.15	10,657.2	6,942.2	105.8	-49.4	799,366.67	567,062.59	49.88	1.65	

Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Igloo 19-24 State Fed Com 13H
Project:	Igloo 19-24 State Fed Com 13H	TVD Reference:	WELL @ 3715.0usft (Original Well Elev)
Site:	Igloo 19-24 State Fed Com 13H	MD Reference:	WELL @ 3715.0usft (Original Well Elev)
Well:	Igloo 19-24 State Fed Com 13H	North Reference:	Grid
Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
Design:	Igloo 19-24 State Fed Com 13H	Database:	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
10,784.0	49.72	270.37	10,690.2	6,975.2	105.9	-84.2	799,331.80	567,062.75	84.76	12.88
10,831.0	56.78	270.44	10,718.3	7,003.3	106.2	-121.9	799,294.16	567,063.01	122.39	15.02
10,878.0	60.44	271.14	10,742.7	7,027.7	106.8	-162.0	799,254.05	567,063.57	162.50	7.89
10,925.0	63.77	270.96	10,764.7	7,049.7	107.5	-203.5	799,212.52	567,064.33	204.03	7.09
10,972.0	65.69	270.67	10,784.8	7,069.8	108.1	-246.0	799,170.03	567,064.94	246.53	4.12
11,019.0	71.58	269.60	10,801.9	7,086.9	108.2	-289.8	799,126.28	567,065.03	290.28	12.71
11,066.0	78.23	268.57	10,814.1	7,099.1	107.5	-335.1	799,080.93	567,064.30	335.62	14.31
11,113.0	85.68	268.23	10,820.7	7,105.7	106.2	-381.6	799,034.45	567,063.00	382.10	15.87
11,160.0	91.68	269.37	10,821.8	7,106.8	105.2	-428.5	798,987.49	567,062.02	429.05	12.99
11,254.0	92.74	269.81	10,818.2	7,103.2	104.5	-522.5	798,893.57	567,061.35	522.97	1.22
11,317.0	93.17	269.90	10,814.9	7,099.9	104.4	-585.4	798,830.65	567,061.19	585.89	0.70
11,338.0	93.33	270.79	10,813.7	7,098.7	104.5	-606.4	798,809.68	567,061.31	606.85	4.30
11,432.0	93.11	271.58	10,808.5	7,093.5	106.4	-700.2	798,715.85	567,063.25	700.69	0.87
11,526.0	93.17	272.04	10,803.3	7,088.3	109.4	-794.0	798,622.04	567,066.22	794.52	0.49
11,620.0	93.16	272.64	10,798.1	7,083.1	113.2	-887.8	798,528.26	567,070.05	888.31	0.64
11,714.0	94.09	270.71	10,792.2	7,077.2	116.0	-981.5	798,434.50	567,072.79	982.09	2.28
11,808.0	94.17	270.61	10,785.4	7,070.4	117.1	-1,075.3	798,340.75	567,073.87	1,075.85	0.14
11,902.0	94.12	271.12	10,778.6	7,063.6	118.5	-1,169.0	798,247.00	567,075.29	1,169.60	0.54
11,997.0	94.17	271.72	10,771.7	7,056.7	120.8	-1,263.8	798,152.28	567,077.64	1,264.33	0.63
12,090.0	93.05	271.83	10,765.9	7,050.9	123.7	-1,356.5	798,059.51	567,080.51	1,357.11	1.21
12,184.0	93.08	269.63	10,760.9	7,045.9	124.9	-1,450.4	797,965.66	567,081.71	1,450.97	2.34
12,279.0	93.08	269.03	10,755.8	7,040.8	123.8	-1,545.2	797,870.80	567,080.60	1,545.82	0.63
12,373.0	93.19	269.20	10,750.6	7,035.6	122.3	-1,639.1	797,776.96	567,079.15	1,639.66	0.22
12,467.0	93.19	270.09	10,745.4	7,030.4	121.7	-1,732.9	797,683.10	567,078.57	1,733.50	0.95
12,561.0	93.16	270.73	10,740.2	7,025.2	122.4	-1,826.8	797,589.25	567,079.24	1,827.36	0.68
12,656.0	93.02	269.98	10,735.1	7,020.1	123.0	-1,921.6	797,494.39	567,079.83	1,922.22	0.80
12,750.0	93.08	269.62	10,730.1	7,015.1	122.7	-2,015.5	797,400.53	567,079.50	2,016.08	0.39

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Site:	Igloo 19-24 State Fed Com 13H	MD Reference:	WELL @ 3715.0usft (Original Well Elev)
Well:	Igloo 19-24 State Fed Com 13H	North Reference:	Grid
Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
Design:	Igloo 19-24 State Fed Com 13H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
12,845.0	93.05	268.82	10,725.0	7,010.0	121.4	-2,110.4	797,305.67	567,078.21	2,110.93	0.84	
12,939.0	93.36	267.94	10,719.7	7,004.7	118.7	-2,204.2	797,211.86	567,075.55	2,204.73	0.99	
13,034.0	94.09	267.94	10,713.5	6,998.5	115.3	-2,298.9	797,117.12	567,072.15	2,299.45	0.77	
13,127.0	94.09	267.69	10,706.9	6,991.9	111.8	-2,391.6	797,024.42	567,068.61	2,392.13	0.27	
13,222.0	94.09	268.35	10,700.1	6,985.1	108.5	-2,486.3	796,929.72	567,065.34	2,486.81	0.69	
13,316.0	94.03	269.31	10,693.5	6,978.5	106.6	-2,580.1	796,835.98	567,063.42	2,580.54	1.02	
13,410.0	94.03	270.15	10,686.9	6,971.9	106.2	-2,673.8	796,742.21	567,062.98	2,674.31	0.89	
13,504.0	93.08	269.97	10,681.0	6,966.0	106.3	-2,767.6	796,648.40	567,063.08	2,768.12	1.03	
13,598.0	92.83	269.17	10,676.2	6,961.2	105.6	-2,861.5	796,554.53	567,062.37	2,861.99	0.89	
13,692.0	89.94	271.26	10,673.9	6,958.9	105.9	-2,955.5	796,460.57	567,062.73	2,955.95	3.79	
13,787.0	89.92	270.51	10,674.0	6,959.0	107.4	-3,050.5	796,365.58	567,064.19	3,050.94	0.79	
13,881.0	90.03	268.42	10,674.1	6,959.1	106.5	-3,144.4	796,271.59	567,063.32	3,144.93	2.23	
13,976.0	90.64	266.08	10,673.5	6,958.5	101.9	-3,239.3	796,176.71	567,058.76	3,239.79	2.55	
14,070.0	93.05	264.82	10,670.5	6,955.5	94.5	-3,333.0	796,083.06	567,051.31	3,333.39	2.89	
14,165.0	95.07	265.28	10,663.8	6,948.8	86.3	-3,427.4	795,988.66	567,043.13	3,427.76	2.18	
14,259.0	98.03	266.30	10,653.1	6,938.1	79.5	-3,520.5	795,895.54	567,036.27	3,520.84	3.33	
14,354.0	98.77	267.01	10,639.2	6,924.2	74.0	-3,614.3	795,801.72	567,030.79	3,614.64	1.07	
14,448.0	99.29	267.35	10,624.4	6,909.4	69.4	-3,707.0	795,708.99	567,026.22	3,707.33	0.66	
14,542.0	99.97	267.55	10,608.7	6,893.7	65.3	-3,799.6	795,616.41	567,022.10	3,799.90	0.75	
14,636.0	100.66	267.72	10,591.9	6,876.9	61.5	-3,892.0	795,524.01	567,018.28	3,892.28	0.76	
14,746.0	102.90	267.90	10,569.4	6,854.4	57.3	-3,999.6	795,416.41	567,014.17	3,999.85	2.04	
14,840.0	103.08	272.13	10,548.3	6,833.3	57.4	-4,091.2	795,324.84	567,014.19	4,091.42	4.39	
14,934.0	96.36	274.53	10,532.4	6,817.4	62.8	-4,183.6	795,232.41	567,019.59	4,183.88	7.58	
15,028.0	92.41	273.91	10,525.2	6,810.2	69.7	-4,277.1	795,138.96	567,026.48	4,277.37	4.25	
15,122.0	88.63	273.07	10,524.4	6,809.4	75.4	-4,370.9	795,045.15	567,032.20	4,371.20	4.12	
15,216.0	89.50	274.13	10,525.9	6,810.9	81.3	-4,464.7	794,951.35	567,038.10	4,465.03	1.46	
15,311.0	89.58	270.76	10,526.7	6,811.7	85.3	-4,559.6	794,856.46	567,042.15	4,559.94	3.55	

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Well:	Igloo 19-24 State Fed Com 13H	North Reference:	Grid
Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
Design:	Igloo 19-24 State Fed Com 13H	Database:	EDM 5000.1 Single User Db

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)
15,405.0	90.95	270.59	10,526.2	6,811.2	86.4	-4,653.6	794,762.47	567,043.26	4,653.94	1.47
15,499.0	89.52	272.17	10,525.9	6,810.9	88.7	-4,747.5	794,668.50	567,045.53	4,747.91	2.27
15,594.0	89.78	273.34	10,526.4	6,811.4	93.3	-4,842.4	794,573.61	567,050.09	4,842.82	1.26
15,689.0	90.78	273.73	10,526.0	6,811.0	99.1	-4,937.2	794,478.80	567,055.95	4,937.66	1.13
15,783.0	91.65	271.85	10,524.0	6,809.0	103.7	-5,031.1	794,384.93	567,060.52	5,031.55	2.20
15,877.0	90.03	270.95	10,522.6	6,807.6	106.0	-5,125.1	794,290.98	567,062.82	5,125.52	1.97
15,971.0	90.00	270.79	10,522.6	6,807.6	107.4	-5,219.0	794,196.99	567,064.25	5,219.51	0.17
16,065.0	90.62	271.62	10,522.1	6,807.1	109.4	-5,313.0	794,103.01	567,066.22	5,313.50	1.10
16,159.0	89.86	270.66	10,521.7	6,806.7	111.3	-5,407.0	794,009.03	567,068.09	5,407.48	1.30
16,253.0	89.69	268.56	10,522.0	6,807.0	110.6	-5,501.0	793,915.04	567,067.45	5,501.47	2.24
16,347.0	90.67	268.04	10,521.7	6,806.7	107.8	-5,595.0	793,821.08	567,064.67	5,595.41	1.18
16,442.0	89.55	268.70	10,521.6	6,806.6	105.1	-5,689.9	793,726.12	567,061.96	5,690.36	1.37
16,536.0	89.75	269.00	10,522.1	6,807.1	103.3	-5,783.9	793,632.14	567,060.08	5,784.33	0.38
16,630.0	90.62	269.52	10,521.8	6,806.8	102.0	-5,877.9	793,538.15	567,058.86	5,878.31	1.08
16,724.0	89.44	268.60	10,521.8	6,806.8	100.5	-5,971.9	793,444.17	567,057.32	5,972.29	1.59
16,819.0	89.83	268.43	10,522.4	6,807.4	98.0	-6,066.8	793,349.20	567,054.86	6,067.24	0.45
16,913.0	90.62	268.82	10,522.0	6,807.0	95.8	-6,160.8	793,255.23	567,052.60	6,161.20	0.94
17,007.0	88.82	268.88	10,522.5	6,807.5	93.9	-6,254.8	793,161.26	567,050.72	6,255.16	1.92
17,102.0	89.80	270.29	10,523.6	6,808.6	93.2	-6,349.8	793,066.27	567,050.03	6,350.15	1.81
17,196.0	87.84	269.20	10,525.6	6,810.6	92.8	-6,443.7	792,972.30	567,049.61	6,444.12	2.39
17,290.0	87.79	268.75	10,529.1	6,814.1	91.1	-6,537.7	792,878.38	567,047.93	6,538.02	0.48
17,385.0	87.76	268.28	10,532.8	6,817.8	88.6	-6,632.6	792,783.48	567,045.47	6,632.91	0.50
17,479.0	90.36	268.07	10,534.4	6,819.4	85.7	-6,726.5	792,689.55	567,042.48	6,726.82	2.77
17,573.0	91.23	268.62	10,533.1	6,818.1	82.9	-6,820.4	792,595.60	567,039.76	6,820.76	1.09
17,667.0	92.60	268.79	10,529.9	6,814.9	80.8	-6,914.4	792,501.68	567,037.64	6,914.67	1.47
17,762.0	91.26	268.79	10,526.7	6,811.7	78.8	-7,009.3	792,406.76	567,035.63	7,009.58	1.41
17,856.0	90.25	269.83	10,525.5	6,810.5	77.7	-7,103.3	792,312.77	567,034.50	7,103.56	1.54

Company:	Caza Operating LLC	Local Co-ordinate Reference:	Well Igloo 19-24 State Fed Com 13H
Project:	Igloo 19-24 State Fed Com 13H	TVD Reference:	WELL @ 3715.0usft (Original Well Elev)
Site:	Igloo 19-24 State Fed Com 13H	MD Reference:	WELL @ 3715.0usft (Original Well Elev)
Well:	Igloo 19-24 State Fed Com 13H	North Reference:	Grid
Wellbore:	Igloo 19-24 State Fed Com 13H	Survey Calculation Method:	Minimum Curvature
Design:	Igloo 19-24 State Fed Com 13H	Database:	EDM 5000.1 Single User Db

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	Easting (usft)	Northing (usft)	V. Sec (usft)	DLeg (°/100usft)	
17,951.0	90.59	269.79	10,524.8	6,809.8	77.4	-7,198.3	792,217.78	567,034.19	7,198.55	0.36	
18,045.0	92.27	269.52	10,522.4	6,807.4	76.8	-7,292.2	792,123.81	567,033.62	7,292.51	1.81	
18,140.0	90.36	268.55	10,520.3	6,805.3	75.2	-7,387.2	792,028.86	567,032.02	7,387.46	2.25	
18,234.0	92.02	268.67	10,518.3	6,803.3	72.9	-7,481.1	791,934.91	567,029.74	7,481.39	1.77	
18,328.0	93.17	269.17	10,514.1	6,799.1	71.2	-7,575.0	791,841.02	567,027.97	7,575.27	1.33	
18,422.0	91.57	269.18	10,510.2	6,795.2	69.8	-7,668.9	791,747.11	567,026.62	7,669.17	1.70	
18,516.0	92.18	269.41	10,507.1	6,792.1	68.6	-7,762.9	791,653.17	567,025.46	7,763.10	0.69	
18,610.0	94.12	269.44	10,501.9	6,786.9	67.7	-7,856.7	791,559.32	567,024.52	7,856.95	2.06	
18,704.0	92.52	269.61	10,496.5	6,781.5	66.9	-7,950.5	791,465.49	567,023.74	7,950.78	1.71	
18,798.0	92.80	270.36	10,492.1	6,777.1	66.9	-8,044.4	791,371.59	567,023.72	8,044.67	0.85	
18,846.0	93.19	270.36	10,489.6	6,774.6	67.2	-8,092.4	791,323.66	567,024.02	8,092.61	0.81	
18,913.0	93.19	270.36	10,485.9	6,770.9	67.6	-8,159.3	791,256.76	567,024.44	8,159.51	0.00	

Checked By: _____	Approved By: _____	Date: _____
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