

Results of Directional Survey

API number:	30-025-40604		
OGRID:		Operator:	CAZA OPERATING, LLC
		Property:	IGLOO 19 STATE # 2H

surface	ULSTR:	A	19	T	20S	R	35E
				200	FNL	660	FEL

BH Loc	ULSTR:	P	19	T	20S	R	35E
16000	MD	11626.2	TVD	359	FSL	327	FEL
				4921	FNL		

Top Perf/OH	ULSTR:	A	19	T	20S	R	35E
12135	MD	11516.1	TVD	1069	FNL	616	FEL

Bot Perf/OH	ULSTR:	P	19	T	20S	R	35E
15893	MD	11624.9	TVD	466	FSL	334	FEL
				4814	FNL		

	MD	N/S	E/W	VD
	12062	-796.40	39.80	11515
TOP PERFS/OH	12135	-869.25	43.64	11516.08
	12157	-891.20	44.80	11516.40
	15866	-4587.50	324.50	11624.50
BOT PERFS/OH	15893	-4614.43	326.30	11624.92
	15944	-4665.30	329.70	11625.70

NEXT TO LAST	15944	-4665.30	329.70	11625.70
LAST READING	16000	-4721.20	333.00	11626.20
TD	16000	-4721.20	333.00	11626.20

Surface Location	200	FN	660	FE
Projected BHL	4921	FN	327	FE
Location of				
Top Perfs/OH	1069	FN	616	FE
Bottom Perfs/OH	4814	FN	334	FE

SUMMARY of Subsurface Locations

Surface Location	A-19-20S-35E	200	FN	660	FE	Vert. Depth
Top Perfs/OH	A-19-20S-35E	1069	FN	616	FE	11516.08
Bottom Perfs/OH	P-19-20S-35E	4814	FN	334	FE	11624.92
Projected TD	P-19-20S-35E	4921	FN	327	FE	11626.20

DEC 19 2014



Company: CAZA
Lease/Well: IGLOO BRR STATE/#2H

Rig Name: PATRIOT #1
State/County: TEXAS/LEA
Latitude: 32.67, Longitude: -103.49
GRID North is 0.45 Degrees East of True North
VS-Azi: 0.00 Degrees



FIELD COPY ONLY (NOT DEFINITIVE)

Depth Reference : RKB: 18 FEET

DRILLOG HA GYRO SURVEY CALCULATIONS

Filename: gyro survey.ut
Minimum Curvature Method
Report Date/Time: 10/30/2014 / 00:52

Vaughn Energy Services
West Texas
(432) 563-5444
Jordan Shelleby

HOBBS OCD

DEC 17 2014

RECEIVED

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.49	228.42	100.00	-0.28	-0.32	-0.28	0.43	228.42	0.49
200.00	0.68	181.01	199.99	-1.08	-0.66	-1.08	1.26	211.03	0.44
300.00	0.66	241.40	299.99	-1.86	-1.17	-1.86	2.20	212.02	0.63
400.00	0.88	262.32	399.98	-2.24	-2.44	-2.24	3.31	227.35	0.36
500.00	0.86	271.17	499.97	-2.33	-3.94	-2.33	4.58	239.41	0.14
600.00	0.61	249.68	599.96	-2.50	-5.19	-2.50	5.76	244.26	0.36
700.00	0.81	277.53	699.95	-2.59	-6.39	-2.59	6.89	247.89	0.39
800.00	0.77	260.89	799.94	-2.61	-7.75	-2.61	8.18	251.40	0.23
900.00	0.69	269.65	899.94	-2.72	-8.93	-2.72	9.34	253.07	0.21
1000.00	0.43	280.40	999.93	-2.65	-9.82	-2.65	10.17	264.87	0.19
1100.00	0.67	289.66	1099.93	-2.39	-10.73	-2.39	10.99	267.43	0.25
1200.00	0.44	312.79	1199.92	-1.94	-11.56	-1.94	11.72	260.49	0.31
1300.00	0.42	290.33	1299.92	-1.55	-12.18	-1.55	12.28	262.75	0.17
1400.00	0.82	294.87	1399.92	-1.12	-13.17	-1.12	13.22	265.14	0.41
1500.00	0.67	304.46	1499.91	-0.49	-14.31	-0.49	14.32	268.05	0.19
1600.00	0.61	308.45	1599.90	0.17	-15.20	0.17	15.21	270.65	0.08
1700.00	0.55	300.52	1699.90	0.74	-16.03	0.74	16.05	272.66	0.10
1800.00	0.89	306.93	1799.89	1.45	-17.06	1.45	17.12	274.87	0.35
1900.00	0.96	320.05	1899.88	2.56	-18.22	2.56	18.40	277.99	0.22
2000.00	1.34	330.01	1999.85	4.21	-19.34	4.21	19.79	282.29	0.43
2100.00	1.18	320.81	2099.83	6.02	-20.57	6.02	21.44	286.32	0.26
2200.00	0.65	319.69	2199.82	7.25	-21.59	7.25	22.78	288.57	0.53
2300.00	0.75	309.56	2299.81	8.10	-22.46	8.10	23.88	289.83	0.16
2400.00	0.69	291.95	2399.80	8.71	-23.44	8.71	25.01	290.38	0.26
2500.00	0.72	311.80	2499.80	9.32	-24.39	9.32	26.11	290.92	0.26
2600.00	0.78	288.98	2599.79	9.97	-25.51	9.97	27.39	291.34	0.30
2700.00	0.60	289.69	2699.78	10.37	-26.55	10.37	28.60	291.25	0.18
2800.00	0.66	294.10	2799.78	10.78	-27.68	10.78	29.70	291.28	0.08
2900.00	0.64	295.37	2899.77	11.26	-28.71	11.26	30.84	291.41	0.02
3000.00	0.32	317.66	2999.77	11.71	-29.41	11.71	31.65	291.70	0.37
3100.00	0.55	5.07	3099.76	12.39	-29.56	12.39	32.05	292.75	0.41
3200.00	0.90	63.88	3199.76	13.22	-28.81	13.22	31.70	294.64	0.77
3300.00	0.90	39.27	3299.74	14.17	-27.61	14.17	31.04	297.16	0.38
3400.00	1.06	37.18	3399.73	15.51	-26.56	15.51	30.76	300.29	0.17

DEC 17 2014

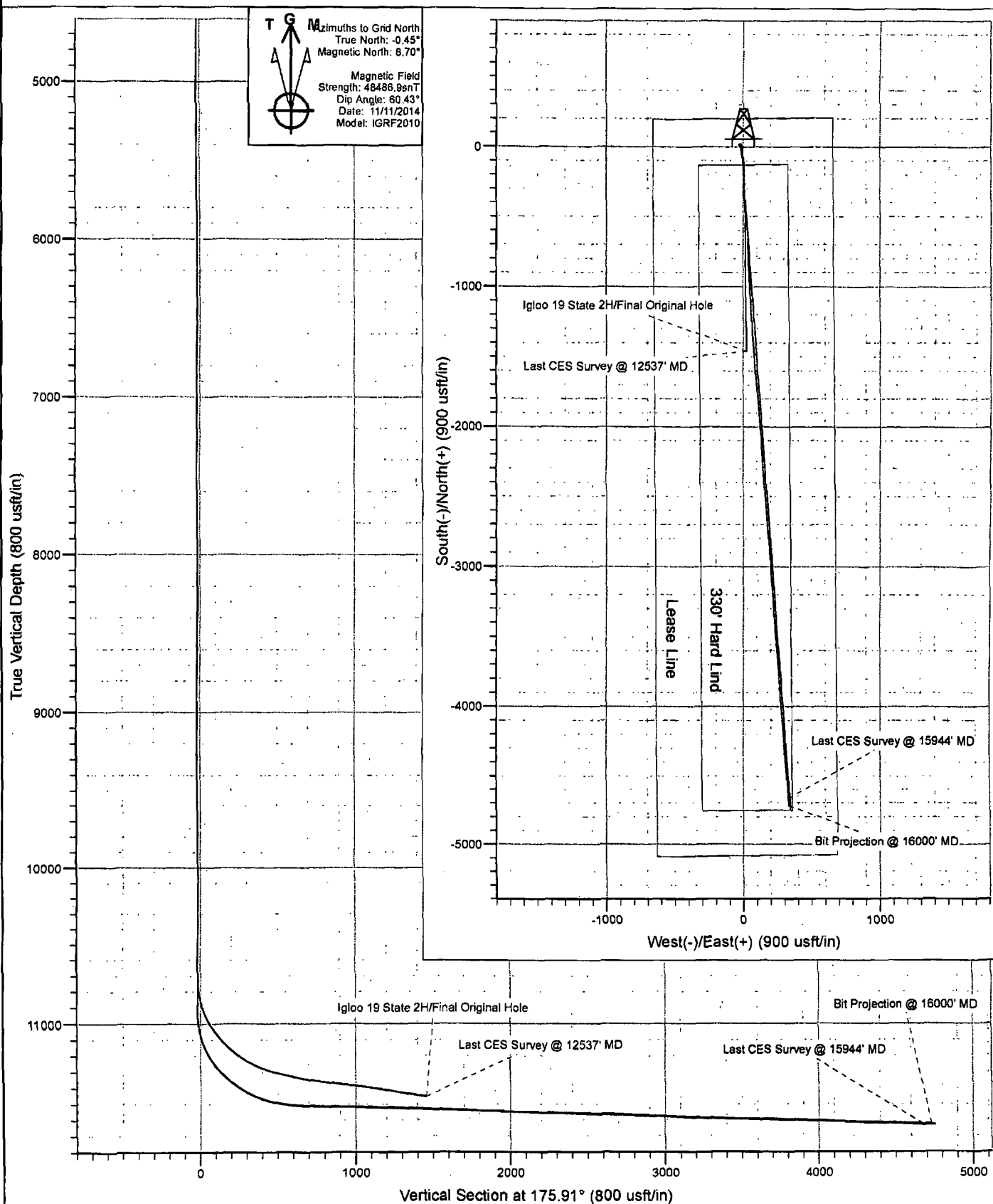
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
3500.00	1.08	20.79	3499.71	17.13	-25.66	17.13	30.86	303.72	0.31
3600.00	0.62	337.88	3699.70	18.51	-25.54	18.51	31.54	305.94	0.75
3700.00	0.20	110.37	3699.70	18.95	-25.58	18.95	31.83	306.54	0.77
3800.00	0.88	99.45	3799.69	18.76	-24.65	18.76	30.98	307.28	0.69
3900.00	0.65	26.32	3899.69	19.15	-23.64	19.15	30.42	309.01	0.93
4000.00	0.26	326.81	3999.68	19.85	-23.52	19.85	30.77	310.16	0.57
4100.00	0.11	218.58	4099.68	19.96	-23.70	19.96	30.99	310.10	0.31
4200.00	0.34	113.77	4199.68	19.77	-23.49	19.77	30.70	310.09	0.38
4300.00	0.33	179.32	4299.68	19.36	-23.21	19.36	30.23	309.84	0.36
4400.00	0.32	130.50	4399.68	18.89	-22.99	18.89	29.76	309.41	0.27
4500.00	0.41	137.30	4499.68	18.45	-22.54	18.45	29.13	309.31	0.10
4600.00	0.29	108.93	4599.68	18.11	-22.06	18.11	28.54	309.38	0.21
4700.00	0.36	97.03	4699.68	17.99	-21.51	17.99	28.04	309.90	0.10
4800.00	0.07	31.58	4799.67	18.01	-21.17	18.01	27.79	310.38	0.33
4900.00	0.19	203.09	4899.67	17.91	-21.20	17.91	27.75	310.19	0.26
5000.00	0.14	266.85	4999.67	17.75	-21.39	17.75	27.79	309.69	0.18
5100.00	0.41	287.45	5099.67	17.85	-21.85	17.85	28.22	309.24	0.29
5200.00	0.28	279.23	5199.67	18.00	-22.44	18.00	28.77	308.73	0.14
5300.00	0.13	226.44	5299.67	17.96	-22.77	17.96	29.00	308.27	0.23
5400.00	0.39	297.56	5399.67	18.04	-23.15	18.04	29.35	307.93	0.37
5500.00	0.47	168.76	5499.67	17.80	-23.37	17.80	29.37	307.29	0.77
5600.00	0.69	148.86	5599.66	16.88	-22.98	16.88	28.51	306.31	0.30
5700.00	0.49	173.50	5699.66	15.95	-22.62	15.95	27.67	305.18	0.32
5800.00	0.43	161.62	5799.66	15.16	-22.45	15.16	27.09	304.03	0.11
5900.00	0.16	110.90	5899.66	14.75	-22.20	14.75	26.66	303.60	0.36
6000.00	0.31	131.23	5999.65	14.53	-21.88	14.53	26.26	303.59	0.17
6100.00	0.16	54.19	6099.65	14.41	-21.55	14.41	25.93	303.77	0.28
6200.00	0.26	99.52	6199.65	14.44	-21.21	14.44	25.66	304.24	0.16
6300.00	0.22	57.96	6299.65	14.50	-20.82	14.50	25.38	304.85	0.17
6400.00	0.23	52.90	6399.65	14.72	-20.50	14.72	25.24	305.69	0.02
6500.00	0.21	359.56	6499.65	15.03	-20.34	15.03	25.29	306.45	0.20
6600.00	0.31	26.44	6599.65	15.45	-20.23	15.45	25.45	307.37	0.15
6700.00	0.17	28.55	6699.65	15.82	-20.04	15.82	25.53	308.29	0.14
6800.00	0.38	54.40	6799.65	16.14	-19.70	16.14	25.47	309.33	0.24
6900.00	0.12	37.50	6899.65	16.42	-19.37	16.42	25.39	310.29	0.27
7000.00	0.26	41.29	6999.64	16.67	-19.15	16.67	25.39	311.05	0.14
7100.00	0.29	201.14	7099.64	16.61	-19.09	16.61	25.30	311.03	0.55
7200.00	0.29	208.26	7199.64	16.15	-19.30	16.15	25.16	309.92	0.04
7300.00	0.13	188.20	7299.64	15.81	-19.44	15.81	25.05	309.12	0.17
7400.00	0.28	221.29	7399.64	15.51	-19.62	15.51	25.01	308.33	0.19
7500.00	0.20	132.83	7499.64	15.21	-19.55	15.21	24.85	307.73	0.34
7600.00	0.16	100.53	7599.64	15.06	-19.39	15.06	24.56	307.84	0.11
7700.00	0.10	134.94	7699.64	14.98	-19.20	14.98	24.35	307.96	0.09
7800.00	0.10	95.79	7799.64	14.91	-19.04	14.91	24.19	308.05	0.07
7900.00	0.08	110.49	7899.64	14.87	-18.89	14.87	24.04	308.22	0.03
8000.00	0.17	146.88	7999.64	14.73	-18.74	14.73	23.84	308.16	0.11
8100.00	0.07	51.85	8099.64	14.65	-18.61	14.65	23.68	308.20	0.19
8200.00	0.10	225.83	8199.64	14.62	-18.62	14.62	23.68	308.14	0.17
8300.00	0.14	293.42	8299.64	14.61	-18.79	14.61	23.81	307.86	0.13
8400.00	0.21	231.78	8399.64	14.55	-19.05	14.55	23.97	307.37	0.19
8500.00	0.48	279.44	8499.64	14.50	-19.60	14.50	24.38	306.51	0.37
8600.00	0.44	322.01	8599.63	14.87	-20.24	14.87	25.12	306.31	0.33
8700.00	0.58	341.89	8699.63	15.68	-20.63	15.66	25.90	307.19	0.22
8800.00	0.59	340.33	8799.63	16.62	-20.96	16.62	26.75	308.40	0.02
8900.00	0.20	317.19	8899.62	17.23	-21.25	17.23	27.36	309.03	0.41

Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
9000.00	0.19	266.32	8999.62	17.31	-21.54	17.31	27.63	308.80	0.20
9100.00	0.06	274.00	9099.62	17.28	-21.75	17.28	27.78	308.46	0.14
9200.00	0.68	55.53	9199.62	17.57	-21.38	17.57	27.67	309.41	0.63
9300.00	0.71	106.36	9299.61	17.68	-20.37	17.68	26.98	310.96	0.56
9400.00	0.64	103.58	9399.61	17.38	-19.24	17.38	25.93	312.10	0.07
9500.00	0.87	109.09	9499.60	17.00	-17.98	17.00	24.75	313.40	0.24
9600.00	0.91	105.15	9599.59	16.55	-16.50	16.55	23.37	315.08	0.07
9700.00	0.62	104.20	9699.58	16.21	-15.21	16.21	22.23	316.81	0.29
9800.00	0.67	141.36	9799.57	15.62	-14.32	15.62	21.19	317.47	0.41
9900.00	0.41	158.50	9899.57	14.82	-13.83	14.82	20.27	316.99	0.30
10000.00	0.33	164.01	9999.57	14.21	-13.61	14.21	19.68	316.23	0.09
10100.00	0.23	115.28	10099.56	13.85	-13.35	13.85	19.24	316.05	0.25
10200.00	0.37	26.09	10199.56	14.06	-13.03	14.06	19.17	317.18	0.44
10300.00	0.56	9.76	10299.56	14.83	-12.80	14.83	19.59	319.21	0.23
10400.00	0.58	14.81	10399.56	15.80	-12.59	15.80	20.21	321.46	0.05
10500.00	0.48	30.25	10499.55	16.65	-12.25	16.65	20.67	323.67	0.17
10600.00	0.08	108.15	10599.55	17.00	-11.97	17.00	20.79	324.84	0.47
10665.00	0.31	200.16	10664.55	16.82	-11.99	16.82	20.66	324.51	0.50

HORIZONTAL DISPLACEMENT IS
20.66 FEET AT 324.51 DEGREES



Project: Lea County, NM (Nad 83)
Site: Igloo 19 State
Well: Igloo 19 State 2H
Wellbore: Sidetrack
Design: Final
Rig: Patriot 1



Survey Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well Igloo 19 State 2H
Project:	Lea County, NM (Nad 83)	TVD Reference:	well @ 3695.5usft (Patriot 1)
Site:	Igloo 19 State	MD Reference:	well @ 3695.5usft (Patriot 1)
Well:	Igloo 19 State 2H	North Reference:	Grid
Wellbore:	Sidetrack	Survey Calculation Method:	Minimum Curvature
Design:	Final	Database:	USA EDM 5000 Multi Users DB

Project:	Lea County, NM (Nad 83)		
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 State			
Site Position:		Northing:	570,440.46 usft	Latitude:	32.565368
From:	Map	Easting:	801,089.54 usft	Longitude:	-103.490189
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.45 °

Well:	Igloo 19 State 2H					
Well Position	+N/-S	0.0 usft	Northing:	570,440.46 usft	Latitude:	32.565368
	+E/-W	0.0 usft	Easting:	801,089.54 usft	Longitude:	-103.490189
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	3,677.0 usft	

Wellbore		Sidetrack			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/11/2014	7.15	60.43	48,487

Design:	Final				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	10,665.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.0	0.0	0.0	175.91	

Survey Program		Date	11/19/2014		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.0	10,665.0	Gyro (Gyros)	Gyro	Gyro	
10,762.0	16,000.0	Sidetrack Surveys (Sidetrack)	ISCWSA MWD	MWD - ISCWSA	

Survey									
Measured	Vertical								
Depth	Inclination	Azimuth	Depth	+N/-S	+E/-W	Vertical	Dogleg	Build	Formations /
(usft)	(°)	(°)	(usft)	(usft)	(usft)	Section	Rate	Rate	Comments
						(usft)	(°/100usft)	(°/100u)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	
100.0	0.49	228.49	100.0	-0.3	-0.3	0.3	0.49	0.49	
200.0	0.58	181.08	200.0	-1.1	-0.6	1.0	0.44	0.09	
300.0	0.66	241.47	300.0	-1.9	-1.2	1.8	0.63	0.08	
400.0	0.88	262.39	400.0	-2.2	-2.4	2.1	0.35	0.22	
500.0	0.88	271.24	500.0	-2.3	-3.9	2.0	0.14	-0.02	
600.0	0.81	249.75	600.0	-2.5	-5.2	2.1	0.37	-0.25	
700.0	0.81	277.60	700.0	-2.6	-6.4	2.1	0.39	0.20	
800.0	0.77	280.96	799.9	-2.6	-7.8	2.0	0.23	-0.04	
900.0	0.59	269.72	899.9	-2.7	-6.9	2.1	0.21	-0.18	
1,000.0	0.43	280.47	999.9	-2.6	-9.8	1.9	0.19	-0.16	
1,100.0	0.67	289.73	1,099.9	-2.4	-10.7	1.6	0.26	0.24	

Survey Report

Company:	Caiza Operating, LLC	Local Co-ordinate Reference:	Well Igloo 19 State 2H
Project:	Lea County, NM (Nad 83)	TVD Reference:	well @ 3695.5usft (Patriot 1)
Site:	Igloo 19 State	MD Reference:	well @ 3695.5usft (Patriot 1)
Well:	Igloo 19 State 2H	North Reference:	Grid
Wellbore:	Sidetrack	Survey Calculation Method:	Minimum Curvature
Design:	Final	Database:	USA EDM 5000 Multi Users DB

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations / Comments
1,200.0	0.44	312.88	1,199.9	-1.9	-11.6	1.1	0.32	-0.23	
1,300.0	0.42	290.40	1,299.9	-1.5	-12.2	0.6	0.17	-0.02	
1,400.0	0.82	294.94	1,399.9	-1.1	-13.2	0.1	0.40	0.40	
1,500.0	0.67	304.53	1,499.9	-0.5	-14.3	-0.8	0.19	-0.15	
1,600.0	0.61	308.52	1,599.9	0.2	-15.2	-1.3	0.07	-0.06	
1,700.0	0.55	300.59	1,699.9	0.8	-16.0	-1.9	0.10	-0.06	
1,800.0	0.89	307.00	1,799.9	1.5	-17.1	-2.7	0.35	0.34	
1,900.0	0.96	320.12	1,899.9	2.6	-18.2	-3.9	0.22	0.07	
2,000.0	1.34	330.08	1,999.9	4.3	-19.4	-5.6	0.43	0.38	
2,100.0	1.18	320.88	2,099.8	6.1	-20.6	-7.5	0.26	-0.16	
2,200.0	0.65	319.76	2,199.8	7.3	-21.6	-8.8	0.53	-0.53	
2,300.0	0.75	309.63	2,299.8	8.2	-22.5	-9.7	0.18	0.10	
2,400.0	0.59	292.02	2,399.8	8.8	-23.5	-10.4	0.26	-0.16	
2,500.0	0.72	311.87	2,499.8	9.4	-24.4	-11.1	0.26	0.13	
2,600.0	0.78	289.05	2,599.8	10.0	-25.5	-11.8	0.30	0.06	
2,700.0	0.60	289.76	2,699.8	10.4	-26.7	-12.3	0.18	-0.18	
2,800.0	0.66	294.17	2,799.8	10.8	-27.7	-12.8	0.08	0.06	
2,900.0	0.64	295.44	2,899.8	11.3	-28.7	-13.3	0.02	-0.02	
3,000.0	0.32	317.73	2,999.8	11.8	-29.4	-13.8	0.36	-0.32	
3,100.0	0.55	5.14	3,099.8	12.4	-29.5	-14.5	0.41	0.23	
3,200.0	0.90	63.95	3,199.8	13.3	-28.8	-15.3	0.77	0.35	
3,300.0	0.90	39.34	3,299.7	14.2	-27.6	-16.1	0.38	0.00	
3,400.0	1.06	37.25	3,399.7	15.6	-26.5	-17.4	0.18	0.16	
3,500.0	1.08	20.86	3,499.7	17.2	-25.6	-19.0	0.31	0.02	
3,600.0	0.62	337.95	3,599.7	18.6	-25.5	-20.3	0.75	-0.46	
3,700.0	0.20	110.44	3,699.7	19.0	-25.5	-20.8	0.77	-0.42	
3,800.0	0.88	99.52	3,799.7	18.8	-24.6	-20.5	0.68	0.68	
3,900.0	0.65	26.39	3,899.7	19.2	-23.6	-20.8	0.93	-0.23	
4,000.0	0.26	325.88	3,999.7	19.9	-23.5	-21.5	0.57	-0.39	
4,100.0	0.11	218.65	4,099.7	20.0	-23.7	-21.6	0.31	-0.15	
4,200.0	0.34	113.84	4,199.7	19.8	-23.5	-21.4	0.38	0.23	
4,300.0	0.33	179.39	4,299.7	19.4	-23.2	-21.0	0.36	-0.01	
4,400.0	0.32	130.57	4,399.7	18.9	-23.0	-20.5	0.27	-0.01	
4,500.0	0.41	137.37	4,499.7	18.5	-22.5	-20.0	0.10	0.09	
4,600.0	0.29	109.00	4,599.7	18.1	-22.0	-19.7	0.21	-0.12	
4,700.0	0.36	97.10	4,699.7	18.0	-21.5	-19.5	0.10	0.07	
4,800.0	0.07	31.65	4,799.7	18.0	-21.1	-19.5	0.34	-0.29	
4,900.0	0.19	203.16	4,899.7	17.9	-21.2	-19.4	0.26	0.12	
5,000.0	0.14	266.92	4,999.7	17.8	-21.4	-19.2	0.18	-0.05	
5,100.0	0.41	287.52	5,099.7	17.9	-21.8	-19.4	0.28	0.27	
5,200.0	0.28	279.30	5,199.7	18.0	-22.4	-19.6	0.14	-0.13	
5,300.0	0.13	226.51	5,299.7	18.0	-22.7	-19.6	0.23	-0.15	
5,400.0	0.39	297.63	5,399.7	18.1	-23.1	-19.7	0.37	0.26	
5,500.0	0.47	168.83	5,499.7	17.8	-23.3	-19.4	0.78	0.08	
5,600.0	0.69	148.93	5,599.7	16.9	-22.9	-18.5	0.30	0.22	
5,700.0	0.49	173.57	5,699.7	16.0	-22.6	-17.5	0.32	-0.20	
5,800.0	0.43	161.69	5,799.7	15.2	-22.4	-16.7	0.11	-0.06	
5,900.0	0.16	110.97	5,899.7	14.8	-22.2	-16.3	0.35	-0.27	
6,000.0	0.31	131.30	5,999.7	14.5	-21.8	-16.1	0.17	0.15	
6,100.0	0.16	64.26	6,099.7	14.4	-21.5	-15.9	0.29	-0.15	
6,200.0	0.26	99.59	6,199.7	14.4	-21.2	-15.9	0.16	0.10	
6,300.0	0.22	58.03	6,299.7	14.5	-20.8	-16.0	0.17	-0.04	
6,400.0	0.23	52.97	6,399.6	14.7	-20.4	-16.2	0.02	0.01	

Survey Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well Igloo 19 State 2H
Project:	Lea County, NM (Nad 83)	TVD Reference:	well @ 3695.5usft (Patriot 1)
Site:	Igloo 19 State	MD Reference:	well @ 3695.5usft (Patriot 1)
Well:	Igloo 19 State 2H	North Reference:	Grid
Wellbore:	Sidetrack	Survey Calculation Method:	Minimum Curvature
Design:	Final	Database:	USA EDM 5000 Multi Users DB

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	N-S (usft)	E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100u)	Formations/Comments
6,500.0	0.21	359.63	6,499.6	15.0	-20.3	-16.4	0.20	-0.02	
6,600.0	0.31	28.51	6,599.6	15.5	-20.2	-16.9	0.16	0.10	
6,700.0	0.17	28.72	6,699.6	15.8	-20.0	-17.2	0.14	-0.14	
6,800.0	0.38	54.47	6,799.6	16.2	-19.6	-17.5	0.24	0.21	
6,900.0	0.12	37.57	6,899.6	16.4	-19.3	-17.8	0.27	-0.26	
7,000.0	0.26	41.36	6,999.6	16.7	-19.1	-18.0	0.14	0.14	
7,100.0	0.29	201.21	7,099.6	16.6	-19.0	-17.9	0.54	0.03	
7,200.0	0.29	208.33	7,199.6	16.2	-19.2	-17.5	0.04	0.00	
7,300.0	0.13	188.27	7,299.6	15.8	-19.4	-17.2	0.17	-0.16	
7,400.0	0.28	221.36	7,399.6	15.5	-19.6	-16.9	0.19	0.15	
7,500.0	0.20	132.90	7,499.6	15.2	-19.6	-16.6	0.34	-0.08	
7,600.0	0.16	100.60	7,599.6	15.1	-19.3	-16.4	0.11	-0.04	
7,700.0	0.10	135.01	7,699.6	15.0	-19.1	-16.3	0.10	-0.06	
7,800.0	0.10	95.86	7,799.6	14.9	-19.0	-16.2	0.07	0.00	
7,900.0	0.08	110.56	7,899.6	14.9	-18.8	-16.2	0.03	-0.02	
8,000.0	0.17	146.95	7,999.6	14.7	-18.7	-16.0	0.12	0.09	
8,100.0	0.07	51.92	8,099.6	14.7	-18.6	-15.9	0.19	-0.10	
8,200.0	0.10	225.90	8,199.6	14.6	-18.6	-15.9	0.17	0.03	
8,300.0	0.14	293.49	8,299.6	14.6	-18.7	-15.9	0.14	0.04	
8,400.0	0.21	231.85	8,399.6	14.6	-19.0	-15.9	0.19	0.07	
8,500.0	0.48	279.51	8,499.6	14.5	-19.6	-15.9	0.37	0.27	
8,600.0	0.44	322.08	8,599.6	14.9	-20.2	-16.3	0.34	-0.04	
8,700.0	0.58	341.96	8,699.6	15.7	-20.6	-17.1	0.22	0.14	
8,800.0	0.59	340.40	8,799.6	16.6	-20.9	-18.1	0.02	0.01	
8,900.0	0.20	317.26	8,899.6	17.3	-21.2	-18.7	0.41	-0.39	
9,000.0	0.19	256.39	8,999.6	17.3	-21.5	-18.8	0.20	-0.01	
9,100.0	0.06	274.07	9,099.6	17.3	-21.7	-18.8	0.13	-0.13	
9,200.0	0.58	55.60	9,199.6	17.6	-21.3	-19.1	0.83	0.52	
9,300.0	0.71	106.43	9,299.6	17.7	-20.3	-19.1	0.57	0.13	
9,400.0	0.64	103.65	9,399.6	17.4	-19.2	-18.7	0.08	-0.07	
9,500.0	0.87	109.16	9,499.6	17.0	-17.9	-18.3	0.24	0.23	
9,600.0	0.91	105.22	9,599.6	16.6	-16.5	-17.7	0.07	0.04	
9,700.0	0.62	104.27	9,699.6	16.2	-15.2	-17.3	0.29	-0.29	
9,800.0	0.67	141.43	9,799.6	15.6	-14.3	-16.6	0.41	0.05	
9,900.0	0.41	158.57	9,899.6	14.8	-13.8	-15.8	0.30	-0.26	
10,000.0	0.33	164.08	9,999.6	14.2	-13.6	-15.2	0.09	-0.08	
10,100.0	0.23	115.35	10,099.6	13.9	-13.3	-14.8	0.25	-0.10	
10,200.0	0.37	26.16	10,199.6	14.1	-13.0	-15.0	0.43	0.14	
10,300.0	0.56	9.83	10,299.6	14.8	-12.8	-15.7	0.23	0.19	
10,400.0	0.58	14.88	10,399.6	15.8	-12.5	-16.7	0.05	0.02	
10,500.0	0.48	30.32	10,499.6	16.7	-12.2	-17.5	0.17	-0.10	
10,600.0	0.08	108.22	10,599.6	17.0	-11.9	-17.8	0.47	-0.40	
10,665.0	0.31	200.23	10,664.5	16.8	-11.9	-17.6	0.50	0.35	
10,762.0	1.30	225.50	10,761.5	15.8	-12.8	-16.7	1.06	1.02	
10,825.0	1.30	316.50	10,824.5	15.8	-13.8	-16.8	2.94	0.00	
10,857.0	1.50	326.10	10,856.5	16.4	-14.3	-17.4	0.96	0.63	
10,889.0	1.70	327.10	10,888.5	17.2	-14.8	-18.2	0.63	0.63	
10,920.0	0.80	278.20	10,919.5	17.6	-15.3	-18.6	4.26	-2.90	
10,952.0	2.80	196.90	10,951.5	16.9	-15.7	-18.0	8.73	6.25	
10,984.0	5.60	187.40	10,983.4	14.6	-16.1	-15.7	8.99	8.75	
11,016.0	8.00	181.10	11,015.1	10.8	-16.4	-11.9	7.84	7.50	
11,048.0	11.30	176.40	11,046.7	5.4	-16.2	-6.6	10.59	10.31	
11,079.0	15.30	173.80	11,076.9	-1.7	-15.6	0.5	13.04	12.90	

Survey Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well Igloo 19 State 2H
Project:	Lea County, NM (Nad 83)	TVD Reference:	well @ 3695.5usft (Patriot-1)
Site:	Igloo 19 State	MD Reference:	well @ 3695.5usft (Patriot-1)
Well:	Igloo 19 State 2H	North Reference:	Grid
Wellbore:	Sidetrack	Survey Calculation Method:	Minimum Curvature
Design:	Final	Database:	USA EDM 5000 Multi Users DB

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usf)	Build Rate (°/100u)	Formations/ Comments
11,111.0	19.50	171.50	11,107.4	-11.1	-14.3	10.1	13.30	13.13	
11,143.0	23.60	170.00	11,137.1	-22.7	-12.4	21.8	12.93	12.81	
11,174.0	29.90	170.10	11,164.8	-36.5	-10.0	35.7	20.32	20.32	
11,208.0	29.90	171.00	11,192.5	-52.2	-7.4	51.5	1.40	0.00	
11,238.0	33.10	172.10	11,219.8	-68.7	-5.0	68.2	10.16	10.00	
11,269.0	36.10	173.70	11,245.3	-66.2	-2.6	85.8	10.11	9.68	
11,301.0	39.00	175.70	11,270.7	-105.6	-1.0	105.3	9.83	9.06	
11,332.0	41.70	176.40	11,294.3	-125.6	0.4	125.3	8.83	8.71	
11,364.0	45.10	176.80	11,317.6	-147.6	1.7	147.3	10.68	10.63	
11,396.0	48.50	177.90	11,339.5	-170.9	2.7	170.6	10.92	10.63	
11,427.0	52.40	177.40	11,359.2	-194.8	3.7	194.5	12.64	12.58	
11,459.0	55.70	178.00	11,378.0	-220.6	4.8	220.4	10.42	10.31	
11,491.0	58.20	177.60	11,395.5	-247.4	5.8	247.2	7.88	7.81	
11,522.0	60.40	177.40	11,411.3	-274.1	7.0	273.9	7.12	7.10	
11,554.0	62.60	176.80	11,426.5	-302.2	8.4	302.0	7.07	6.88	
11,586.0	65.50	176.40	11,440.6	-330.9	10.1	330.8	9.13	9.06	
11,618.0	68.40	176.20	11,453.1	-360.3	12.0	360.2	9.08	9.06	
11,650.0	71.10	175.90	11,464.2	-390.2	14.1	390.2	8.48	8.44	
11,681.0	74.10	175.80	11,473.4	-419.7	16.2	419.8	9.68	9.68	
11,713.0	76.10	176.00	11,481.6	-450.5	18.4	450.7	6.28	6.25	
11,745.0	77.50	176.80	11,489.0	-481.6	20.4	481.9	4.74	4.38	
11,776.0	79.00	176.80	11,495.3	-511.9	22.2	512.2	4.88	4.84	
11,807.0	81.60	176.70	11,500.5	-542.4	23.9	542.8	8.39	8.39	
11,839.0	84.30	176.60	11,504.4	-574.1	25.8	574.5	8.44	8.44	
11,871.0	85.30	176.60	11,507.3	-606.0	27.6	606.4	3.13	3.13	
11,966.0	88.30	176.10	11,512.6	-700.6	33.7	701.2	3.20	3.16	
12,062.0	88.90	176.60	11,515.0	-796.4	39.8	797.2	0.81	0.63	
12,157.0	89.40	177.30	11,516.4	-891.2	44.8	892.2	0.91	0.53	
12,252.0	89.80	178.10	11,517.0	-986.1	48.7	987.1	0.94	0.42	
12,347.0	89.70	177.70	11,517.5	-1,081.1	52.1	1,082.1	0.43	-0.11	
12,442.0	88.70	176.30	11,518.8	-1,175.9	57.1	1,177.0	1.81	-1.05	
12,537.0	88.80	176.30	11,520.9	-1,270.7	63.2	1,272.0	0.11	0.11	
12,632.0	87.20	174.30	11,524.2	-1,365.3	71.0	1,366.9	2.70	-1.68	
12,727.0	87.20	174.20	11,528.8	-1,459.7	80.5	1,461.8	0.11	0.00	
12,822.0	87.50	175.10	11,533.2	-1,554.2	89.4	1,556.6	1.00	0.32	
12,917.0	88.20	175.40	11,536.8	-1,648.8	97.2	1,651.6	0.80	0.74	
13,013.0	87.90	175.30	11,540.0	-1,744.5	105.0	1,747.5	0.33	-0.31	
13,108.0	88.60	175.80	11,542.9	-1,839.1	112.4	1,842.5	0.91	0.74	
13,203.0	87.70	174.80	11,546.0	-1,933.8	120.2	1,937.4	1.42	-0.95	
13,298.0	88.10	175.40	11,549.5	-2,028.3	128.3	2,032.3	0.76	0.42	
13,393.0	88.70	176.10	11,552.1	-2,123.0	135.3	2,127.3	0.97	0.63	
13,488.0	88.70	175.60	11,554.3	-2,217.8	142.2	2,222.3	0.53	0.00	
13,583.0	89.30	176.20	11,555.9	-2,312.5	149.0	2,317.3	0.89	0.63	
13,679.0	88.60	175.70	11,557.7	-2,408.3	155.7	2,413.3	0.90	-0.73	
13,774.0	89.00	176.20	11,559.7	-2,503.0	162.5	2,508.2	0.67	0.42	
13,869.0	88.30	175.40	11,561.9	-2,597.7	169.4	2,603.2	1.12	-0.74	
13,964.0	88.60	175.80	11,564.5	-2,692.4	176.7	2,698.2	0.53	0.32	
14,059.0	87.20	174.50	11,568.0	-2,787.0	184.7	2,793.1	2.01	-1.47	
14,154.0	86.90	174.90	11,572.9	-2,881.5	193.5	2,888.0	0.53	-0.32	
14,249.0	87.80	175.90	11,577.3	-2,976.1	201.1	2,982.8	1.42	0.95	
14,344.0	87.90	177.00	11,580.8	-3,070.8	207.0	3,077.8	1.16	0.11	
14,439.0	86.60	176.20	11,585.4	-3,165.6	212.6	3,172.7	1.61	-1.37	
14,534.0	87.90	174.70	11,589.9	-3,260.1	220.1	3,267.5	2.09	1.37	

Survey Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well Igloo 19 State 2H
Project:	Lea County, NM (Nad 83)	TVD Reference:	well @ 3695.5usft (Patriot 1)
Site:	Igloo 19 State	MD Reference:	well @ 3695.5usft (Patriot 1)
Well:	Igloo 19 State 2H	North Reference:	Grid:
Wellbore:	Sidetrack	Survey Calculation Method:	Minimum Curvature
Design:	Final	Database:	USA EDM 5000 Multi Users DB

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Degleg Rate (°/100usft)	Build Rate (°/100usft)	Formations / Comments
14,829.0	88.80	175.10	11,592.7	-3,354.7	228.6	3,382.5	1.04	0.95	
14,724.0	89.30	175.20	11,594.3	-3,449.4	236.6	3,457.5	0.54	0.53	
14,819.0	89.70	175.90	11,595.1	-3,544.1	244.0	3,552.5	0.85	0.42	
14,915.0	89.90	176.40	11,595.4	-3,639.9	250.4	3,648.5	0.56	0.21	
15,010.0	88.50	176.20	11,596.7	-3,734.7	256.5	3,743.4	1.49	-1.47	
15,105.0	88.00	175.90	11,599.7	-3,829.4	263.1	3,838.4	0.61	-0.53	
15,200.0	87.70	175.10	11,603.2	-3,924.0	270.5	3,933.3	0.90	-0.32	
15,295.0	88.40	175.20	11,606.4	-4,018.6	278.6	4,028.3	0.74	0.74	
15,390.0	89.00	175.60	11,608.6	-4,113.3	286.2	4,123.2	0.76	0.63	
15,486.0	87.80	175.10	11,611.3	-4,208.9	294.0	4,219.2	1.35	-1.25	
15,581.0	88.70	175.70	11,614.2	-4,303.6	301.6	4,314.1	1.14	0.95	
15,676.0	87.30	175.10	11,617.5	-4,398.2	309.2	4,409.1	1.60	-1.47	
15,771.0	87.80	175.30	11,621.6	-4,492.8	317.1	4,504.0	0.57	0.53	
15,866.0	88.70	175.80	11,624.5	-4,587.5	324.5	4,598.9	1.08	0.95	
15,944.0	89.50	176.60	11,625.7	-4,665.3	329.7	4,676.9	1.45	1.03	Last CES Survey @ 15944' MD
16,000.0	89.50	176.60	11,626.2	-4,721.2	333.0	4,732.9	0.00	0.00	Bit Projection @ 16000' MD

Target Name	hit/miss target	Dip Angle (°)	Dip Dir (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL Igloo 2H P5 ST		0.00	0.00	11,631.0	-4,741.8	345.0	565,698.66	801,434.51	32.552328	-103.489192
	- actual wellpath misses target center by 24.3usft at 16000.0usft MD (11626.2 TVD, -4721.2 N, 333.0 E)									
	- Point									
PBHL Igloo 2H P4 (copy		0.00	0.07	11,631.0	-4,741.8	345.0	565,698.66	801,434.51	32.552328	-103.489192
	- actual wellpath misses target center by 24.3usft at 16000.0usft MD (11626.2 TVD, -4721.2 N, 333.0 E)									
	- Point									

Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
15,944.0	11,625.7	-4,665.3	329.7	Last CES Survey @ 15944' MD
16,000.0	11,626.2	-4,721.2	333.0	Bit Projection @ 16000' MD

Checked By: _____	Approved By: _____	Date: _____
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Caza Operating, LLC

Lea County, NM (Nad 83)

Igloo 19 State

Igloo 19 State 2H

Sidetrack

Final

Anticollision Report

19 November, 2014

Anticollision Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well Igloo 19 State 2H
Project:	Lea County, NM (Nad 83)	TVD Reference:	well @ 3695.5usft (Patriot 1)
Reference Site:	Igloo 19 State	MD Reference:	well @ 3695.5usft (Patriot 1)
Site Error:	0.0usft	North Reference:	Grid
Reference Well:	Igloo 19 State 2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Sidetrack	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Final	Offset TVD Reference:	Offset Datum

Reference	Final		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 100.0usft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,500.0usft	Error Surface:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma		

Survey Program		Date	11/19/2014	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	10,665.0	Gyro (Gyros)	Gyro	Gyro
10,762.0	16,000.0	Sidetrack Surveys (Sidetrack)	ISCWSA MWD	MWD - ISCWSA

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Igloo 19 State						
Igloo 19 State 2H - HZ - Final Original Hole	10,700.0	10,700.0	0.1	0.0	1.648	CC, ES, SF

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

Anticollision Report

Company:	Caza Operating, LLC	Local Co-ordinate Reference:	Well Igloo 19 State 2H
Project:	Lea County, NM (Nad 83)	TVD Reference:	well @ 3695.5usft (Patriot 1)
Reference Site:	Igloo 19 State	MD Reference:	well @ 3695.5usft (Patriot 1)
Site Error:	0.0usft	North Reference:	Grid
Reference Well:	Igloo 19 State 2H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0usft	Output errors are at	2.00 sigma.
Reference Wellbore:	Sidetrack	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Final	Offset TVD Reference:	Offset Datum

Offset Design Igloo 19 State - Igloo 19 State 2H - HZ - Final Original Hole														Offset Site Error	0.0 usft
Survey Program: 100 Gyro, 10730-ISCWSA MWD														Offset Well Error:	0.0 usft
Reference	Offset	Semi Major Axis		Distance		Between Centres		Between Ellipses		Total Uncertainty		Separation Factor		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre N/S (usft)	Offset Wellbore Centre E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Total Uncertainty (usft)	Separation Factor	Warning		
10,665.0	10,664.5	10,665.0	10,664.5	0.0	0.0	-148.89	16.8	-11.9	0.1	0.0	0.04	1.648	CC, ES, SF		
10,700.0	10,699.5	10,700.0	10,699.5	0.0	0.0	118.14	16.8	-12.1	0.1	0.0	0.19	21.443			
10,800.0	10,799.5	10,799.7	10,799.0	0.0	0.0	-110.88	11.6	-12.9	4.0	3.8	0.38	75.884			
10,900.0	10,899.5	10,899.5	10,899.3	0.0	0.4	-147.79	-8.5	-10.0	28.9	28.5	0.38	75.884			
11,000.0	10,999.3	10,979.9	10,969.7	0.0	0.3	-14.29	-43.0	-5.1	64.2	63.1	1.13	56.945			
11,100.0	11,097.0	11,063.2	11,040.8	0.4	0.4	-1.90	-86.0	-1.0	97.5	95.3	2.19	44.444			
11,200.0	11,187.4	11,147.0	11,105.9	0.5	0.7	1.44	-138.5	3.5	121.4	118.6	2.84	42.899			
11,300.0	11,270.0	11,226.2	11,180.5	0.5	1.1	-0.20	-195.6	8.3	142.2	139.5	2.76	51.472			
11,400.0	11,342.1	11,305.9	11,207.4	1.0	1.8	-0.85	-260.0	8.5	160.0	158.2	1.78	90.059			
11,500.0	11,400.2	11,386.5	11,246.7	1.5	2.2	-0.37	-330.4	10.5	171.0	169.8	1.25	137.080			
11,600.0	11,446.2	11,466.3	11,277.9	2.4	3.0	0.78	-403.6	12.3	178.7	176.0	2.69	66.456			
11,700.0	11,478.4	11,550.7	11,302.3	3.5	3.9	2.28	-484.4	13.6	182.2	178.9	3.29	55.395			
11,800.0	11,499.4	11,641.6	11,322.9	4.7	5.1	3.48	-572.9	14.7	180.6	177.1	3.53	51.210			
11,900.0	11,509.5	11,735.0	11,340.8	6.1	6.4	5.17	-684.7	15.8	171.8	168.3	3.53	48.668			
12,000.0	11,513.6	11,828.8	11,355.6	7.5	7.7	7.53	-757.3	16.4	160.8	156.8	3.99	40.319			
12,100.0	11,515.6	11,924.5	11,368.1	9.0	9.2	10.18	-852.1	16.3	150.8	145.8	5.03	29.995			
12,200.0	11,516.8	12,022.3	11,379.0	10.6	10.6	12.61	-949.3	16.5	141.9	135.5	6.33	22.408			
12,300.0	11,517.2	12,122.3	11,389.6	12.1	12.1	14.65	-1,048.7	17.5	132.6	124.7	7.85	16.882			
12,400.0	11,518.0	12,225.8	11,402.8	13.6	13.6	17.70	-1,151.4	18.7	121.9	111.9	10.06	12.102			
12,500.0	11,520.1	12,327.2	11,419.2	15.1	15.1	22.39	-1,251.4	20.2	110.1	96.9	13.21	8.338			
12,600.0	11,522.8	12,425.5	11,435.2	16.7	16.7	28.25	-1,348.4	21.9	100.1	82.7	17.37	5.764			
12,700.0	11,527.5	12,523.6	11,450.6	18.3	18.3	35.87	-1,445.3	23.0	95.3	72.6	22.70	4.198			
12,710.6	11,528.0	12,534.0	11,452.1	18.5	18.5	36.71	-1,455.5	23.0	95.0	71.7	23.30	4.076			
12,800.0	11,532.2	12,537.0	11,452.6	19.9	18.5	37.14	-1,458.5	23.1	126.3	101.8	24.46	5.163			
12,900.0	11,536.2	12,537.0	11,452.6	21.6	18.5	37.02	-1,458.5	23.1	205.8	180.3	25.52	8.065			
13,000.0	11,539.6	12,537.0	11,452.6	23.3	18.5	37.17	-1,458.5	23.1	297.7	271.0	26.75	11.129			
13,100.0	11,542.7	12,537.0	11,452.6	24.9	18.5	37.12	-1,458.5	23.1	393.5	365.7	27.83	14.139			
13,200.0	11,545.9	12,537.0	11,452.6	26.6	18.5	35.98	-1,458.5	23.1	491.0	462.6	28.42	17.280			
13,300.0	11,549.5	12,537.0	11,452.6	28.3	18.5	37.30	-1,458.5	23.1	589.5	559.2	30.33	19.439			
13,400.0	11,552.3	12,537.0	11,452.6	30.1	18.5	38.20	-1,458.5	23.1	688.2	656.2	32.04	21.482			
13,500.0	11,554.6	12,537.0	11,452.6	31.8	18.5	35.80	-1,458.5	23.1	787.2	755.4	31.74	24.801			
13,600.0	11,556.2	12,537.0	11,452.6	33.5	18.5	36.66	-1,458.5	23.1	886.3	852.8	33.43	26.511			
13,700.0	11,558.2	12,537.0	11,452.6	35.2	18.5	37.12	-1,458.5	23.1	985.6	950.6	34.98	28.177			
13,800.0	11,560.2	12,537.0	11,452.6	36.9	18.5	37.69	-1,458.5	23.1	1,085.1	1,048.5	36.56	29.876			
13,900.0	11,562.8	12,537.0	11,452.6	38.6	18.5	36.50	-1,458.5	23.1	1,184.7	1,147.7	38.98	32.032			
14,000.0	11,565.6	12,537.0	11,452.6	40.4	18.5	36.69	-1,458.5	23.1	1,284.4	1,246.0	38.36	33.479			
14,100.0	11,570.0	12,537.0	11,452.6	42.1	18.5	38.82	-1,458.5	23.1	1,384.2	1,343.0	41.24	33.565			
14,200.0	11,575.2	12,537.0	11,452.6	43.7	18.5	45.94	-1,458.5	23.1	1,484.1	1,436.5	47.84	31.154			

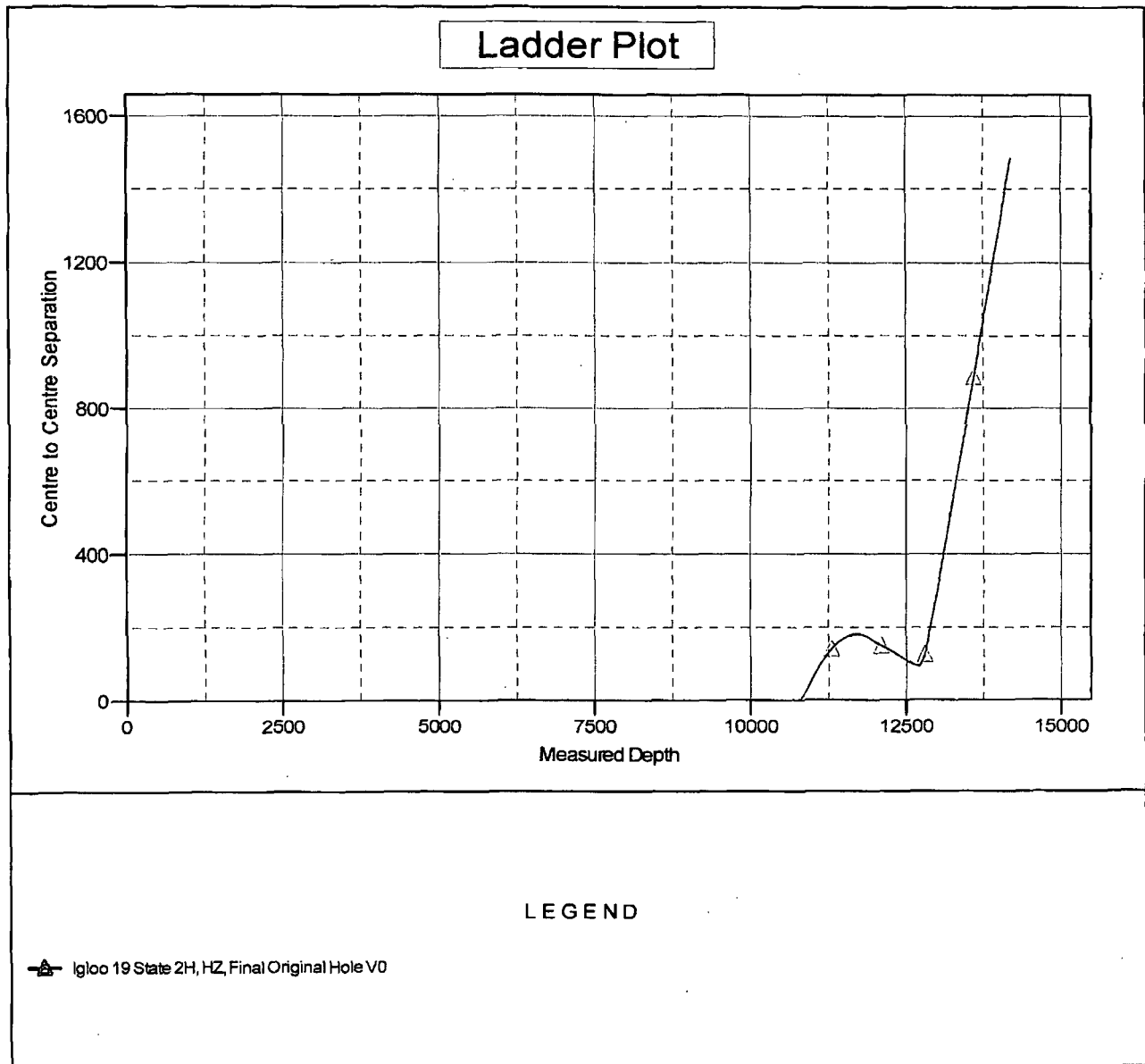
CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

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Reference Wellbore:	Sidetrack	Database:	USA EDM 5000 Multi Users DB
Reference Design:	Final	Offset TVD Reference:	Offset Datum

Reference Depths are relative to well @ 3695.5usft (Patriot 1)
Offset Depths are relative to Offset Datum
Central Meridian is -104.333333 °

Coordinates are relative to: Igloo 19 State 2H
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Grid Convergence at Surface is: 0.45°



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