

Results of Directional Survey

API number:	30-025-40852		
OGRID:		Operator:	MARSHALL & WINSTON INC
		Property:	KLEIN 16 STATE # 2H

surface	ULSTR:	A	16	T 19S	R 35E
				660 FNL	250 FEL

BH Loc	ULSTR:	D	16	T 19S	R 35E
13940	MD	9517.2	TVD	730 FNL	333 FWL
					4947 FEL

Top Perf/OH	ULSTR:	A	16	T 19S	R 35E
9675	MD	9387.7	TVD	655 FNL	686 FEL

Bot Perf/OH	ULSTR:	D	16	T 19S	R 35E
13630	MD	9514.1	TVD	723 FNL	643 FWL
					4637 FEL

	MD	N/S	E/W	VD
	9663	6.40	-424.30	9386.2
TOP PERFS/OH	9675	5.39	-436.15	9387.71
	9694	3.80	-454.90	9390.10
	13544	-61.70	-4300.90	9512.40
BOT PERFS/OH	13630	-63.06	-4386.90	9514.12
	13639	-63.20	-4395.90	9514.30

NEXT TO LAST	13886	-68.50	-4642.80	9516.90
LAST READING	13940	-70.40	-4696.80	9517.20
TD	13940	-70.40	-4696.80	9517.20

Surface Location	660	FN	250	FE
Projected BHL	730	FN	4947	FE
Location of				
Top Perfs/OH	655	FN	686	FE
Bottom Perfs/OH	723	FN	4637	FE

SUMMARY of Subsurface Locations

Surface Location	A-16-19S-35E	660	FN	250	FE	Vert. Depth
Top Perfs/OH	A-16-19S-35E	655	FN	686	FE	9387.71
Bottom Perfs/OH	D-16-19S-35E	723	FN	4637	FE	9514.12
Projected TD	D-16-19S-35E	730	FN	4947	FE	9517.20

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MARSHALL & WINSTON

Scharb

Lea County, NM

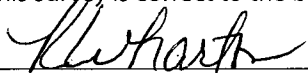
Klein State 16 #2H

VH - Job #32K12121536

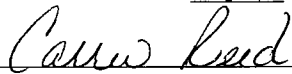
Survey: Gyro

SDI Standard Survey Report

This survey is correct to the best of my knowledge and is supported by actual field data.



Notarized this date 8th of January, 2013.



Notary Signature
County of Midland
State of Texas



Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	MARSHALL & WINSTON	Local Co-ordinate Reference:	Well Klein State 16 #2H
Project:	Scharb	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	Klein State 16 #2H	North Reference:	Grid
Wellbore:	VH - Job #32K12121536	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K12121536	Database:	EDM-Regulatory

Project	Scharb		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site		Lea County, NM			
Site Position:		Northing:	607,084.58 usft	Latitude:	32° 39' 57.226 N
From:	Lat/Long	Easting:	770,561.39 usft	Longitude:	103° 27' 14.908 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.47 °

Well	Klein State 16 #2H, Directional (DDC)					
Well Position	+N/-S	0.00 usft	Northing:	607,084.58 usft	Latitude:	32° 39' 57.226 N
	+E/-W	0.00 usft	Easting:	770,561.39 usft	Longitude:	103° 27' 14.908 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	0.00 usft

Wellbore	VH - Job #32K12121536				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/21/12	7.38	60.58	48,769

Design	VH - Job #32K12121536			
Audit Notes:				
Version:	1.0	Phase:	ACTUAL	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	269.27

Survey Program		Date	01/08/13		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	8,819.00	Gyro (VH - Job #32K12121536)	KSRG	Keeper Gyro	

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.54	240.63	100.00	-0.23	-0.41	240.63	0.47
200.00	0.58	253.57	199.99	-0.61	-1.31	245.14	1.44
300.00	0.86	263.88	299.99	-0.83	-2.54	251.92	2.67
400.00	0.86	276.16	399.97	-0.83	-4.03	258.39	4.11
500.00	1.20	277.36	499.96	-0.61	-5.82	263.98	5.85
600.00	1.25	286.15	599.94	-0.18	-7.90	268.73	7.90
700.00	1.52	273.31	699.91	0.20	-10.27	271.14	10.28
800.00	1.52	272.39	799.87	0.34	-12.92	271.49	12.93
900.00	1.60	275.82	899.83	0.53	-15.64	271.95	15.65
1,000.00	1.24	274.40	999.80	0.76	-18.10	272.40	18.12
1,100.00	1.38	283.84	1,099.78	1.13	-20.35	273.17	20.38

Scientific Drilling International, Inc.
SDI Standard Survey Report



Company:	MARSHALL & WINSTON	Local Co-ordinate Reference:	Well Klein State 16 #2H
Project:	Scharb	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	Klein State 16 #2H	North Reference:	Grid
Wellbore:	VH - Job #32K12121536	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K12121536	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
1,200.00	1.21	254.59	1,199.75	1.14	-22.54	272.89	22.57
1,300.00	1.08	229.49	1,299.73	0.24	-24.27	270.57	24.28
1,400.00	0.81	215.47	1,399.72	-0.94	-25.40	267.87	25.42
1,500.00	0.90	198.43	1,499.71	-2.27	-26.06	265.03	26.16
1,600.00	0.64	234.17	1,599.70	-3.34	-26.76	262.89	26.97
1,700.00	0.68	247.76	1,699.69	-3.89	-27.76	262.03	28.03
1,800.00	0.58	223.02	1,799.69	-4.48	-28.66	261.11	29.01
1,900.00	0.63	226.85	1,899.68	-5.23	-29.40	259.92	29.86
2,000.00	0.31	149.67	1,999.68	-5.84	-29.67	258.87	30.24
2,100.00	0.39	184.51	2,099.68	-6.41	-29.56	257.76	30.25
2,200.00	0.31	150.01	2,199.68	-6.99	-29.45	256.66	30.27
2,300.00	0.41	181.54	2,299.67	-7.58	-29.32	255.51	30.29
2,400.00	0.05	132.71	2,399.67	-7.96	-29.30	254.79	30.36
2,500.00	0.20	94.67	2,499.67	-8.01	-29.10	254.61	30.18
2,600.00	0.19	114.06	2,599.67	-8.09	-28.77	254.29	29.89
2,700.00	0.59	81.68	2,699.67	-8.08	-28.11	253.96	29.25
2,800.00	1.56	60.93	2,799.65	-7.35	-26.41	254.45	27.41
2,900.00	2.14	57.84	2,899.60	-5.69	-23.64	256.46	24.32
3,000.00	2.12	57.74	2,999.53	-3.71	-20.49	259.74	20.83
3,100.00	2.69	54.34	3,099.44	-1.36	-17.02	265.45	17.08
3,200.00	2.79	56.24	3,199.33	1.36	-13.09	275.95	13.17
3,300.00	2.40	52.68	3,299.22	3.99	-9.41	292.97	10.22
3,400.00	2.11	51.21	3,399.15	6.41	-6.31	315.47	8.99
3,500.00	1.56	62.68	3,499.10	8.19	-3.66	335.91	8.97
3,600.00	1.57	56.45	3,599.06	9.57	-1.31	352.20	9.66
3,700.00	1.56	54.56	3,699.02	11.12	0.94	4.84	11.16
3,800.00	1.78	48.28	3,798.98	12.94	3.21	13.93	13.33
3,900.00	1.71	46.63	3,898.93	15.00	5.45	19.98	15.96
4,000.00	1.31	44.34	3,998.90	16.84	7.34	23.54	18.37
4,100.00	1.41	56.55	4,098.87	18.33	9.16	26.55	20.50
4,200.00	0.85	38.61	4,198.85	19.59	10.65	28.53	22.30
4,300.00	0.78	56.97	4,298.84	20.54	11.68	29.63	23.63
4,400.00	0.89	56.46	4,398.83	21.34	12.90	31.15	24.94
4,500.00	0.85	61.11	4,498.82	22.13	14.20	32.68	26.29
4,600.00	0.94	55.96	4,598.81	22.95	15.53	34.09	27.71
4,700.00	0.88	49.12	4,698.79	23.91	16.79	35.08	29.22
4,800.00	0.77	67.41	4,798.78	24.67	17.99	36.10	30.53
4,900.00	0.60	32.34	4,898.78	25.37	18.89	36.67	31.63
5,000.00	0.69	48.02	4,998.77	26.22	19.62	36.81	32.74
5,100.00	0.72	51.55	5,098.76	27.01	20.56	37.28	33.94
5,200.00	0.76	49.38	5,198.75	27.83	21.55	37.75	35.20
5,300.00	0.56	74.60	5,298.75	28.39	22.53	38.43	36.24
5,400.00	0.60	83.98	5,398.74	28.58	23.52	39.45	37.01
5,500.00	0.55	53.76	5,498.74	28.92	24.43	40.19	37.85

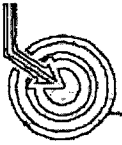
Scientific Drilling International, Inc.

SDI Standard Survey Report



Company:	MARSHALL & WINSTON	Local Co-ordinate Reference:	Well Klein State 16 #2H
Project:	Scharb	TVD Reference:	WELL @ 0.00usft (Original Well Elev)
Site:	Lea County, NM	MD Reference:	WELL @ 0.00usft (Original Well Elev)
Well:	Klein State 16 #2H	North Reference:	Grid
Wellbore:	VH - Job #32K12121536	Survey Calculation Method:	Minimum Curvature
Design:	VH - Job #32K12121536	Database:	EDM-Regulatory

Survey							
Measured Depth (usft)	Inclination (°)	Azimuth (°)	True Vertical Depth	North/South (usft)	East/West (usft)	Closure Azimuth (°)	Closure Distance (usft)
5,600.00	0.43	68.28	5,598.73	29.34	25.16	40.62	38.65
5,700.00	0.68	106.08	5,698.73	29.31	26.08	41.66	39.24
5,800.00	0.53	84.85	5,798.72	29.19	27.11	42.89	39.84
5,900.00	0.88	105.58	5,898.72	29.03	28.31	44.29	40.55
6,000.00	0.99	122.94	5,998.70	28.35	29.78	46.41	41.11
6,100.00	0.53	138.55	6,098.69	27.53	30.81	48.21	41.32
6,200.00	0.28	98.99	6,198.69	27.15	31.36	49.11	41.48
6,300.00	0.46	97.05	6,298.69	27.06	32.00	49.78	41.91
6,400.00	0.52	162.79	6,398.69	26.58	32.53	50.75	42.01
6,500.00	0.72	126.31	6,498.68	25.77	33.17	52.15	42.01
6,600.00	1.00	149.90	6,598.67	24.65	34.11	54.15	42.08
6,700.00	1.20	158.13	6,698.65	22.92	34.94	56.74	41.79
6,800.00	1.21	157.95	6,798.63	20.97	35.73	59.59	41.43
6,900.00	1.24	141.23	6,898.61	19.15	36.80	62.51	41.48
7,000.00	1.09	141.96	6,998.59	17.55	38.06	65.24	41.92
7,100.00	0.90	165.12	7,098.57	16.05	38.85	67.56	42.04
7,200.00	0.72	141.45	7,198.56	14.80	39.45	69.44	42.13
7,300.00	0.60	96.70	7,298.56	14.24	40.36	70.56	42.80
7,400.00	0.26	69.51	7,398.55	14.26	41.09	70.86	43.49
7,500.00	0.37	67.73	7,498.55	14.46	41.60	70.83	44.04
7,600.00	0.49	23.47	7,598.55	14.98	42.07	70.40	44.66
7,700.00	0.42	38.49	7,698.55	15.66	42.47	69.76	45.26
7,800.00	0.27	19.22	7,798.54	16.17	42.77	69.30	45.73
7,900.00	0.71	23.55	7,898.54	16.96	43.10	68.52	46.32
8,000.00	1.14	49.06	7,998.53	18.18	44.10	67.60	47.70
8,100.00	1.80	70.99	8,098.49	19.34	46.33	67.34	50.21
8,200.00	1.83	82.61	8,198.44	20.06	49.40	67.90	53.32
8,300.00	1.77	77.01	8,298.40	20.61	52.49	68.56	56.39
8,400.00	1.85	67.69	8,398.35	21.57	55.49	68.76	59.53
8,500.00	1.36	62.92	8,498.31	22.72	58.04	68.62	62.33
8,600.00	1.19	34.12	8,598.28	24.12	59.68	67.99	64.37
8,700.00	2.25	46.96	8,698.24	26.32	61.70	66.90	67.08
8,800.00	2.34	56.74	8,798.16	28.78	64.84	66.06	70.94
8,819.00	2.44	61.72	8,817.14	29.19	65.52	65.99	71.72

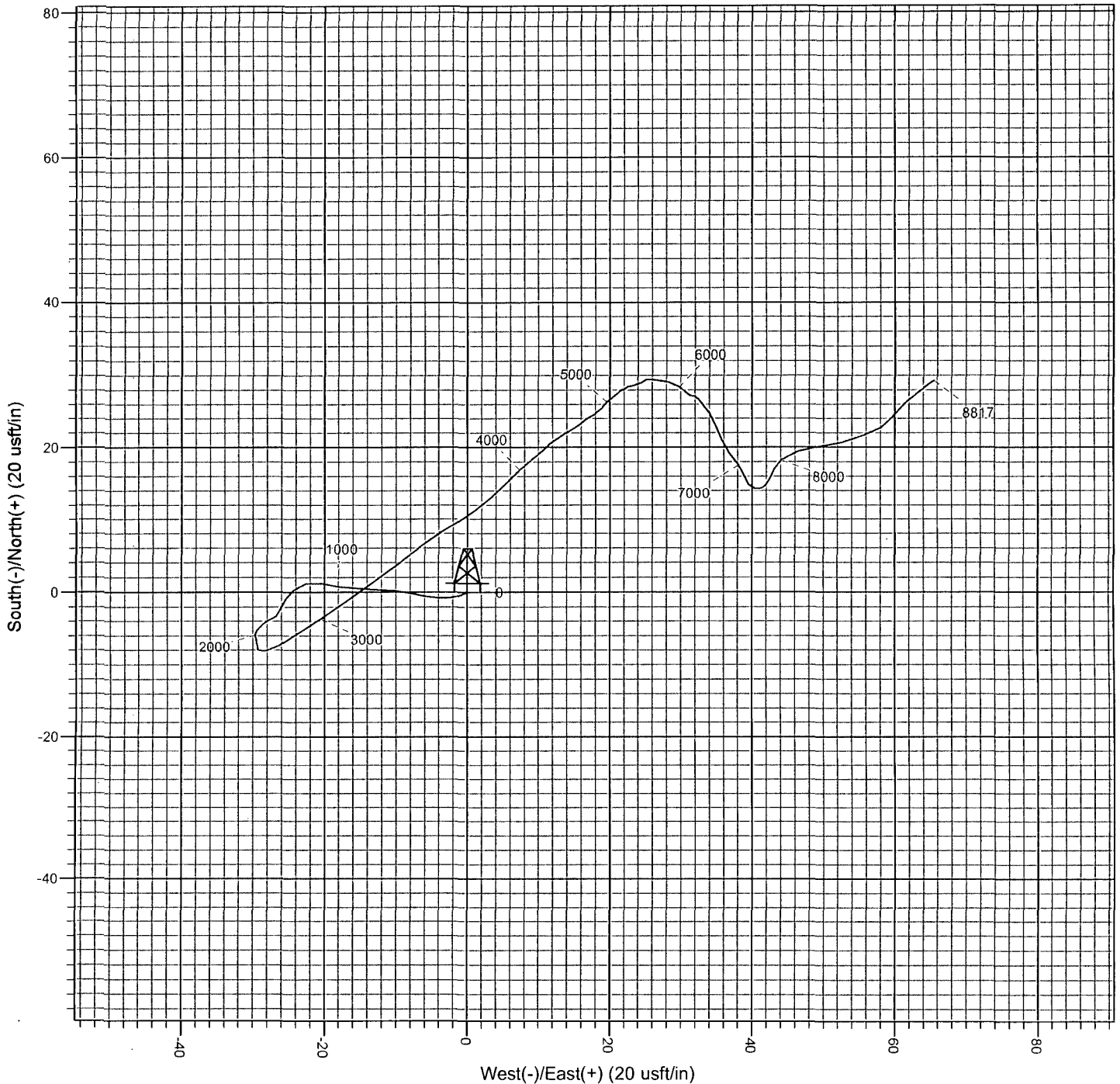


Scientific Drilling

Project: Scharb
Lea County, NM
Well: Klein State 16 #2H
Wellbore: VH - Job #32K12121536
Design: VH - Job #32K12121536

WELL DETAILS: Klein State 16 #2H
WELL @ 0.00usft (Original Well Elev)

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	607084.58	770561.39	32° 39' 57.226 N	103° 27' 14.908 W	



PROJECT DETAILS: Scharb	SITE DETAILS: Lea County, NM
Geodetic System: US State Plane 1927 (Exact solution)	Site Centre Latitude: 32° 39' 57.226 N
Datum: NAD 1927 (NADCON CONUS)	Longitude: 103° 27' 14.908 W
Ellipsoid: Clarke 1866	Positional Uncertainty: 0.00
Zone: New Mexico East 3001	Convergence: 0.47
System Datum: Mean Sea Level	Local North: Grid

30-025-40852

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Marshall & Winston, Inc

Lea County, NM

Sec 16, T19S, R35E Old SHL (Do Not Use)

Klein State 16-2H

Wellbore #1

Design: Wellbore #1

DDC Survey Report

02 January, 2013



Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Klein State 16-2H
Project:	Lea County, NM	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Sec-16, T19S, R35E Old-SHL (Do Not Use)	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Klein State 16-2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Lea County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec 16, T19S, R35E Old-SHL (Do Not Use)		
Site Position:		Northing:	0.00 usft
From:	Map	Easting:	0.00 usft
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "
		Latitude:	30° 59' 24.512 N
		Longitude:	105° 55' 44.137 W
		Grid Convergence:	-0.82 °

Well	Klein State 16-2H		
Well Position	+N/-S	0.0 usft	Northing:
	+E/-W	0.0 usft	Easting:
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft
		Latitude:	30° 59' 24.512 N
		Longitude:	105° 55' 44.137 W
		Ground Level:	0.0 usft

Wellbore	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination (°)
	IGRF2010	10/23/2012	8.34
			Dip Angle (°)
			58.57
			Field Strength (nT)
			47,481

Design	Wellbore #1		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.0	0.0	0.0
			Direction (°)
			269.14

Survey Program	Date 1/2/2013		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
100.0	8,819.0	GYRO (Wellbore #1)	Good_gyro
8,840.0	13,940.0	MWD (Wellbore #1)	MWD default
			Description
			Good Gyro
			MWD - Standard

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.54	240.63	100.0	-0.2	-0.4	0.4	0.54	0.54	0.00
200.0	0.58	253.57	200.0	-0.6	-1.3	1.3	0.13	0.04	12.94
300.0	0.86	263.88	300.0	-0.8	-2.5	2.6	0.31	0.28	10.31
400.0	0.86	276.16	400.0	-0.8	-4.0	4.0	0.18	0.00	12.28
500.0	1.20	277.36	500.0	-0.6	-5.8	5.8	0.34	0.34	1.20
600.0	1.25	286.15	599.9	-0.2	-7.9	7.9	0.19	0.05	8.79
700.0	1.52	273.31	699.9	0.2	-10.3	10.3	0.41	0.27	-12.84
800.0	1.52	272.39	799.9	0.3	-12.9	12.9	0.02	0.00	-0.92
900.0	1.60	275.82	899.8	0.5	-15.6	15.6	0.12	0.08	3.43

Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Klein State-16-2H
Project:	Lea County, NM	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Sec 16, T19S, R35E Old SHL (Do Not Use)	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Klein State 16-2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)
1,000.0	1.24	274.40	999.8	0.8	-18.1	18.1	0.36	-0.36	-1.42
1,100.0	1.38	283.84	1,099.8	1.1	-20.4	20.3	0.26	0.14	9.44
1,200.0	1.21	254.59	1,199.8	1.1	-22.5	22.5	0.67	-0.17	-29.25
1,300.0	1.08	229.49	1,299.7	0.2	-24.3	24.3	0.51	-0.13	-25.10
1,400.0	0.81	215.47	1,399.7	-0.9	-25.4	25.4	0.35	-0.27	-14.02
1,500.0	0.90	198.43	1,499.7	-2.3	-26.1	26.1	0.27	0.09	-17.04
1,600.0	0.64	234.17	1,599.7	-3.3	-26.8	26.8	0.53	-0.26	35.74
1,700.0	0.68	247.76	1,699.7	-3.9	-27.8	27.8	0.16	0.04	13.59
1,800.0	0.58	223.02	1,799.7	-4.5	-28.7	28.7	0.29	-0.10	-24.74
1,900.0	0.63	226.85	1,899.7	-5.2	-29.4	29.5	0.06	0.05	3.83
2,000.0	0.31	149.67	1,999.7	-5.8	-29.7	29.8	0.64	-0.32	-77.18
2,100.0	0.39	184.51	2,099.7	-6.4	-29.6	29.7	0.22	0.08	34.84
2,200.0	0.31	150.01	2,199.7	-7.0	-29.4	29.6	0.22	-0.08	-34.50
2,300.0	0.41	181.54	2,299.7	-7.6	-29.3	29.4	0.22	0.10	31.53
2,400.0	0.05	132.71	2,399.7	-8.0	-29.3	29.4	0.38	-0.36	-48.83
2,500.0	0.20	94.67	2,499.7	-8.0	-29.1	29.2	0.16	0.15	-38.04
2,600.0	0.19	114.06	2,599.7	-8.1	-28.8	28.9	0.07	-0.01	19.39
2,700.0	0.59	81.68	2,699.7	-8.1	-28.1	28.2	0.44	0.40	-32.38
2,800.0	1.56	60.93	2,799.7	-7.3	-26.4	26.5	1.03	0.97	-20.75
2,900.0	2.14	57.84	2,899.6	-5.7	-23.6	23.7	0.59	0.58	-3.09
3,000.0	2.12	57.74	2,999.5	-3.7	-20.5	20.5	0.02	-0.02	-0.10
3,100.0	2.69	54.34	3,099.4	-1.4	-17.0	17.0	0.59	0.57	-3.40
3,200.0	2.79	56.24	3,199.3	1.4	-13.1	13.1	0.14	0.10	1.90
3,300.0	2.40	52.68	3,299.2	4.0	-9.4	9.3	0.42	-0.39	-3.56
3,400.0	2.11	51.21	3,399.1	6.4	-6.3	6.2	0.30	-0.29	-1.47
3,500.0	1.56	62.68	3,499.1	8.2	-3.7	3.5	0.66	-0.55	11.47
3,600.0	1.57	56.45	3,599.1	9.6	-1.3	1.2	0.17	0.01	-6.23
3,700.0	1.56	54.56	3,699.0	11.1	0.9	-1.1	0.05	-0.01	-1.89
3,800.0	1.78	48.28	3,799.0	12.9	3.2	-3.4	0.29	0.22	-6.28
3,900.0	1.71	46.63	3,898.9	15.0	5.5	-5.7	0.09	-0.07	-1.65
4,000.0	1.31	44.34	3,998.9	16.8	7.3	-7.6	0.40	-0.40	-2.29
4,100.0	1.41	56.55	4,098.9	18.3	9.2	-9.4	0.31	0.10	12.21
4,200.0	0.85	38.61	4,198.8	19.6	10.7	-10.9	0.66	-0.56	-17.94
4,300.0	0.78	56.97	4,298.8	20.5	11.7	-12.0	0.27	-0.07	18.36
4,400.0	0.89	56.46	4,398.8	21.3	12.9	-13.2	0.11	0.11	-0.51
4,500.0	0.85	61.11	4,498.8	22.1	14.2	-14.5	0.08	-0.04	4.65
4,600.0	0.94	55.96	4,598.8	22.9	15.5	-15.9	0.12	0.09	-5.15
4,700.0	0.88	49.12	4,698.8	23.9	16.8	-17.1	0.12	-0.06	-6.84
4,800.0	0.77	67.41	4,798.8	24.7	18.0	-18.4	0.28	-0.11	18.29
4,900.0	0.60	32.34	4,898.8	25.4	18.9	-19.3	0.44	-0.17	-35.07
5,000.0	0.69	48.02	4,998.8	26.2	19.6	-20.0	0.20	0.09	15.68
5,100.0	0.72	51.55	5,098.8	27.0	20.6	-21.0	0.05	0.03	3.53
5,200.0	0.76	49.38	5,198.8	27.8	21.6	-22.0	0.05	0.04	-2.17

Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Klein State 16-2H
Project:	Lea County, NM	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Sec 16, T19S, R35E Old SHL (Do Not Use)	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Klein State 16-2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)	
5,300.0	0.56	74.60	5,298.7	28.4	22.5	-23.0	0.35	-0.20	25.22	
5,400.0	0.60	83.98	5,398.7	28.6	23.5	-23.9	0.10	0.04	9.38	
5,500.0	0.55	53.76	5,498.7	28.9	24.4	-24.9	0.30	-0.05	-30.22	
5,600.0	0.43	68.28	5,598.7	29.3	25.2	-25.6	0.17	-0.12	14.52	
5,700.0	0.68	106.08	5,698.7	29.3	26.1	-26.5	0.43	0.25	37.80	
5,800.0	0.53	84.85	5,798.7	29.2	27.1	-27.5	0.27	-0.15	-21.23	
5,900.0	0.88	105.58	5,898.7	29.0	28.3	-28.7	0.43	0.35	20.73	
6,000.0	0.99	122.94	5,998.7	28.4	29.8	-30.2	0.30	0.11	17.36	
6,100.0	0.53	138.55	6,098.7	27.5	30.8	-31.2	0.50	-0.46	15.61	
6,200.0	0.28	98.99	6,198.7	27.1	31.4	-31.8	0.36	-0.25	-39.56	
6,300.0	0.46	97.05	6,298.7	27.1	32.0	-32.4	0.18	0.18	-1.94	
6,400.0	0.52	162.79	6,398.7	26.6	32.5	-32.9	0.53	0.06	65.74	
6,500.0	0.72	126.31	6,498.7	25.8	33.2	-33.6	0.43	0.20	-36.48	
6,600.0	1.00	149.90	6,598.7	24.6	34.1	-34.5	0.45	0.28	23.59	
6,700.0	1.20	158.13	6,698.7	22.9	34.9	-35.3	0.25	0.20	8.23	
6,800.0	1.21	157.95	6,798.6	21.0	35.7	-36.0	0.01	0.01	-0.18	
6,900.0	1.24	141.23	6,898.6	19.1	36.8	-37.1	0.36	0.03	-16.72	
7,000.0	1.09	141.96	6,998.6	17.6	38.1	-38.3	0.15	-0.15	0.73	
7,100.0	0.90	165.12	7,098.6	16.0	38.9	-39.1	0.44	-0.19	23.16	
7,200.0	0.72	141.45	7,198.6	14.8	39.4	-39.7	0.38	-0.18	-23.67	
7,300.0	0.60	96.70	7,298.6	14.2	40.4	-40.6	0.51	-0.12	-44.75	
7,400.0	0.26	69.51	7,398.6	14.3	41.1	-41.3	0.39	-0.34	-27.19	
7,500.0	0.37	67.73	7,498.6	14.5	41.6	-41.8	0.11	0.11	-1.78	
7,600.0	0.49	23.47	7,598.5	15.0	42.1	-42.3	0.34	0.12	-44.26	
7,700.0	0.42	38.49	7,698.5	15.7	42.5	-42.7	0.14	-0.07	15.02	
7,800.0	0.27	19.22	7,798.5	16.2	42.8	-43.0	0.19	-0.15	-19.27	
7,900.0	0.71	23.55	7,898.5	17.0	43.1	-43.3	0.44	0.44	4.33	
8,000.0	1.14	49.06	7,998.5	18.2	44.1	-44.4	0.59	0.43	25.51	
8,100.0	1.80	70.99	8,098.5	19.3	46.3	-46.6	0.86	0.66	21.93	
8,200.0	1.83	82.61	8,198.4	20.1	49.4	-49.7	0.37	0.03	11.62	
8,300.0	1.77	77.01	8,298.4	20.6	52.5	-52.8	0.19	-0.06	-5.60	
8,400.0	1.85	67.69	8,398.3	21.6	55.5	-55.8	0.30	0.08	-9.32	
8,500.0	1.36	62.92	8,498.3	22.7	58.0	-58.4	0.51	-0.49	-4.77	
8,600.0	1.19	34.12	8,598.3	24.1	59.7	-60.0	0.66	-0.17	-28.80	
8,700.0	2.25	46.96	8,698.2	26.3	61.7	-62.1	1.12	1.06	12.84	
8,800.0	2.34	56.74	8,798.2	28.8	64.8	-65.3	0.40	0.09	9.78	
TIE IN @ 8819' MD / 8817' TVD										
8,819.0	2.44	61.72	8,817.1	29.2	65.5	-65.9	1.21	0.53	26.21	
8,840.0	2.30	52.30	8,838.1	29.7	66.2	-66.7	1.97	-0.67	-44.86	
8,872.0	2.10	57.70	8,870.1	30.4	67.2	-67.7	0.90	-0.63	16.88	
8,903.0	1.30	318.10	8,901.1	30.9	67.5	-68.0	8.54	-2.58	-321.29	
8,935.0	4.60	278.30	8,933.0	31.4	66.0	-66.4	11.55	10.31	-124.38	
8,967.0	8.40	274.50	8,964.8	31.8	62.4	-62.8	11.94	11.88	-11.88	

Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Klein State 16-2H
Project:	Lea County, NM	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Sec 16, T19S, R35E Old SHL (Do Not Use)	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Klein State 16-2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)	
8,998.0	12.00	275.00	8,995.3	32.2	56.9	-57.4	11.62	11.61	1.61	
9,030.0	15.70	276.20	9,026.4	33.0	49.3	-49.8	11.60	11.56	3.75	
9,061.0	19.60	276.00	9,055.9	34.0	39.9	-40.5	12.58	12.58	-0.65	
9,093.0	23.40	275.30	9,085.7	35.1	28.3	-28.8	11.90	11.88	-2.19	
9,124.0	27.40	275.00	9,113.7	36.3	15.0	-15.6	12.91	12.90	-0.97	
9,156.0	31.70	275.20	9,141.5	37.7	-0.7	0.1	13.44	13.44	0.63	
9,187.0	35.60	274.80	9,167.3	39.2	-17.8	17.2	12.60	12.58	-1.29	
9,219.0	39.60	271.30	9,192.7	40.2	-37.3	36.7	14.17	12.50	-10.94	
9,250.0	43.40	268.80	9,215.9	40.2	-57.8	57.2	13.37	12.26	-8.06	
CROSSED HARDLINE @ 9282' MD / 9238' TVD										
9,282.0	47.80	266.50	9,238.3	39.3	-80.6	80.0	14.68	13.75	-7.19	
9,314.0	51.90	265.30	9,258.9	37.5	-105.0	104.5	13.13	12.81	-3.75	
9,346.0	55.70	264.40	9,277.8	35.2	-130.7	130.2	12.09	11.88	-2.81	
9,377.0	59.40	264.10	9,294.4	32.6	-156.8	156.3	11.96	11.94	-0.97	
9,410.0	61.90	263.70	9,310.6	29.5	-185.4	184.9	7.65	7.58	-1.21	
9,441.0	64.10	263.20	9,324.7	26.3	-212.8	212.4	7.24	7.10	-1.61	
9,473.0	67.30	263.20	9,337.9	22.9	-241.8	241.4	10.00	10.00	0.00	
9,505.0	70.60	264.40	9,349.3	19.7	-271.5	271.1	10.89	10.31	3.75	
9,536.0	73.60	265.30	9,358.9	17.0	-300.8	300.5	10.06	9.68	2.90	
9,568.0	76.10	265.70	9,367.2	14.6	-331.6	331.4	7.91	7.81	1.25	
9,599.0	77.60	265.30	9,374.3	12.2	-361.7	361.5	5.00	4.84	-1.29	
9,631.0	78.80	264.60	9,380.8	9.5	-392.9	392.7	4.32	3.75	-2.19	
9,663.0	81.80	264.30	9,386.2	6.4	-424.3	424.2	9.42	9.38	-0.94	
9,694.0	83.90	266.00	9,390.1	3.8	-454.9	454.8	8.69	6.77	5.48	
9,726.0	86.70	266.90	9,392.7	1.9	-486.8	486.7	9.19	8.75	2.81	
9,757.0	88.30	267.30	9,394.1	0.3	-517.7	517.6	5.32	5.16	1.29	
9,789.0	88.00	267.10	9,395.1	-1.3	-549.7	549.6	1.13	-0.94	-0.63	
9,820.0	89.60	267.80	9,395.7	-2.7	-580.6	580.6	5.63	5.16	2.26	
9,852.0	89.80	268.10	9,395.9	-3.8	-612.6	612.6	1.13	0.63	0.94	
9,947.0	89.40	267.60	9,396.6	-7.4	-707.5	707.6	0.67	-0.42	-0.53	
10,041.0	88.90	269.50	9,398.0	-9.7	-801.5	801.5	2.09	-0.53	2.02	
10,136.0	88.60	270.40	9,400.0	-9.8	-896.5	896.5	1.00	-0.32	0.95	
10,231.0	88.10	270.20	9,402.8	-9.3	-991.4	991.4	0.57	-0.53	-0.21	
10,325.0	87.90	269.50	9,406.1	-9.6	-1,085.4	1,085.4	0.77	-0.21	-0.74	
10,420.0	87.60	269.00	9,409.8	-10.8	-1,180.3	1,180.3	0.61	-0.32	-0.53	
10,515.0	87.60	269.40	9,413.8	-12.1	-1,275.2	1,275.2	0.42	0.00	0.42	
10,610.0	87.30	269.20	9,418.0	-13.3	-1,370.1	1,370.1	0.38	-0.32	-0.21	
10,705.0	87.10	268.30	9,422.6	-15.4	-1,464.9	1,465.0	0.97	-0.21	-0.95	
10,800.0	87.00	268.10	9,427.5	-18.3	-1,559.8	1,559.9	0.24	-0.11	-0.21	
10,894.0	86.80	267.30	9,432.6	-22.1	-1,653.6	1,653.7	0.88	-0.21	-0.85	
10,989.0	88.90	267.60	9,436.2	-26.3	-1,748.4	1,748.6	2.23	2.21	0.32	
11,084.0	90.00	269.40	9,437.1	-28.8	-1,843.3	1,843.6	2.22	1.16	1.89	
11,178.0	88.50	271.80	9,438.3	-27.8	-1,937.3	1,937.5	3.01	-1.60	2.55	
11,273.0	88.70	272.50	9,440.6	-24.3	-2,032.2	2,032.4	0.77	0.21	0.74	

Company:	Marshall & Winston, Inc	Local Co-ordinate Reference:	Well Klein State 16-2H
Project:	Lea County, NM	TVD Reference:	WELL @ 0.0usft (Original Well Elev)
Site:	Sec 16, T19S, R35E Old SHL (Do Not Use)	MD Reference:	WELL @ 0.0usft (Original Well Elev)
Well:	Klein State 16-2H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)
11,367.0	87.20	271.30	9,444.0	-21.2	-2,126.1	2,126.2	2.04	-1.60	-1.28
11,462.0	87.90	268.30	9,448.1	-21.5	-2,221.0	2,221.1	3.24	0.74	-3.16
11,557.0	89.30	270.60	9,450.4	-22.4	-2,316.0	2,316.0	2.83	1.47	2.42
11,652.0	87.60	269.20	9,452.9	-22.6	-2,410.9	2,411.0	2.32	-1.79	-1.47
11,747.0	87.70	269.00	9,456.8	-24.1	-2,505.8	2,505.9	0.24	0.11	-0.21
11,841.0	88.20	269.40	9,460.2	-25.4	-2,599.8	2,599.9	0.68	0.53	0.43
11,936.0	87.60	268.70	9,463.7	-26.9	-2,694.7	2,694.8	0.97	-0.63	-0.74
12,030.0	89.00	270.80	9,466.5	-27.4	-2,788.6	2,788.7	2.68	1.49	2.23
12,124.0	89.30	270.20	9,467.9	-26.5	-2,882.6	2,882.7	0.71	0.32	-0.64
12,219.0	90.00	271.50	9,468.4	-25.1	-2,977.6	2,977.7	1.55	0.74	1.37
12,314.0	88.70	269.40	9,469.5	-24.4	-3,072.6	3,072.6	2.60	-1.37	-2.21
12,409.0	87.20	266.40	9,472.9	-27.9	-3,167.5	3,167.5	3.53	-1.58	-3.16
12,503.0	87.60	266.50	9,477.2	-33.7	-3,261.2	3,261.3	0.44	0.43	0.11
12,598.0	89.00	268.10	9,480.0	-38.1	-3,356.0	3,356.2	2.24	1.47	1.68
12,693.0	90.50	270.10	9,480.4	-39.6	-3,451.0	3,451.2	2.63	1.58	2.11
12,787.0	87.60	266.90	9,482.0	-42.1	-3,544.9	3,545.2	4.59	-3.09	-3.40
12,882.0	87.80	267.30	9,485.8	-46.9	-3,639.7	3,640.0	0.47	0.21	0.42
12,976.0	89.10	270.90	9,488.3	-48.4	-3,733.7	3,734.0	4.07	1.38	3.83
13,071.0	86.50	268.30	9,492.0	-49.0	-3,828.6	3,828.9	3.87	-2.74	-2.74
13,166.0	87.10	268.70	9,497.3	-51.5	-3,923.4	3,923.7	0.76	0.63	0.42
13,260.0	87.20	268.10	9,502.0	-54.1	-4,017.3	4,017.6	0.65	0.11	-0.64
13,355.0	87.30	268.00	9,506.5	-57.4	-4,112.1	4,112.5	0.15	0.11	-0.11
13,449.0	88.50	269.00	9,510.0	-59.8	-4,206.0	4,206.4	1.66	1.28	1.06
13,544.0	88.60	268.70	9,512.4	-61.7	-4,300.9	4,301.4	0.33	0.11	-0.32
13,639.0	89.10	269.50	9,514.3	-63.2	-4,395.9	4,396.4	0.99	0.53	0.84
13,733.0	89.40	269.20	9,515.5	-64.3	-4,489.9	4,490.4	0.45	0.32	-0.32
13,828.0	89.50	268.10	9,516.4	-66.5	-4,584.9	4,585.3	1.16	0.11	-1.16
13,886.0	89.60	268.00	9,516.9	-68.5	-4,642.8	4,643.3	0.24	0.17	-0.17
TD @ 13940' MD / 9517' TVD									
13,940.0	89.60	268.00	9,517.2	-70.4	-4,696.8	4,697.3	0.00	0.00	0.00

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
8,819.0	8,817.1	29.2	65.5	TIE IN @ 8819' MD / 8817' TVD
9,282.0	9,238.3	39.3	-80.6	CROSSED HARDLINE @ 9282' MD / 9238' TVD
13,940.0	9,517.2	-70.4	-4,696.8	TD @ 13940' MD / 9517' TVD

Checked By: _____ Approved By: _____ Date: _____