15-38569

Nadel & Gussman HEYCO, LLC

Eddy County, New Mexico (NAD83)
Sec 20, T18S, 26E
Cannonball #1H

Wellbore #1

Design: Wellbore #1

DDC Survey Report

20 November, 2012

The DIRECTIONAL DRILLING COMPANY

DDC
Survey Report

Company:	Nadel & Gussman HEYCO, LLC	**Local Co-ordinate Reference:**	Well Cannonball #1H
Project:	Eddy County, New Mexico (NAD83)	**TVD Reference:**	WELL @ 3412.8usft (Original Well Elev)
Site:	Sec 20, T18S, 26E	**MD Reference:**	WELL @ 3412.8usft (Original Well Elev)
Well:	Cannonball #1H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Project Eddy County, New Mexico (NAD83)

Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site Sec 20, T18S, 26E

Site Position:		**Northing:**	630,881.01 usft	**Latitude:**	32° 44' 3.532 N
From:	Map	**Easting:**	521,852.85 usft	**Longitude:**	104° 23' 48.119 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	-0.03 °

Well Cannonball #1H

Well Position	**+N/-S**	0.0 usft	**Northing:**	630,881.01 usft	**Latitude:**	32° 44' 3.532 N
	+E/-W	0.0 usft	**Easting:**	521,852.85 usft	**Longitude:**	104° 23' 48.119 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,412.8 usft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/24/2012	7.84	60.48	48,695

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)	Direction (°)
	0.0	0.0	0.0	69.53

Survey Program **Date** 11/20/2012

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
100.0	1,915.0	GYRO (Wellbore #1)	Good_gyro	Good Gyro
1,996.0	6,932.0	MWD (Wellbore #1)	MWD default	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	0.63	269.59	100.0	0.0	-0.5	-0.5	0.63	0.63	0.00
200.0	0.39	262.94	200.0	0.0	-1.4	-1.4	0.25	-0.24	-6.65
300.0	0.31	282.32	300.0	0.0	-2.0	-1.9	0.14	-0.08	19.38
400.0	0.57	323.15	400.0	0.4	-2.6	-2.3	0.39	0.26	40.83
500.0	0.94	14.70	500.0	1.6	-2.7	-2.0	0.74	0.37	51.55
600.0	1.15	24.36	600.0	3.3	-2.1	-0.8	0.27	0.21	9.66
700.0	1.31	15.46	699.9	5.3	-1.4	0.6	0.25	0.16	-8.90
800.0	0.78	34.19	799.9	7.0	-0.7	1.8	0.62	-0.53	18.73
900.0	0.97	28.87	899.9	8.3	0.1	3.0	0.21	0.19	-5.32

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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	1.18	60.38	999.9	9.6	1.4	4.7	0.62	0.21	31.51
1,100.0	1.14	95.17	1,099.9	10.0	3.3	6.6	0.69	-0.04	34.79
1,200.0	1.30	115.13	1,199.9	9.4	5.3	8.3	0.45	0.16	19.96
1,300.0	1.35	103.39	1,299.8	8.6	7.5	10.1	0.28	0.05	-11.74
1,400.0	1.15	112.33	1,399.8	8.0	9.6	11.8	0.28	-0.20	8.94
1,500.0	1.05	109.16	1,499.8	7.3	11.4	13.2	0.12	-0.10	-3.17
1,600.0	0.89	113.91	1,599.8	6.7	13.0	14.5	0.18	-0.16	4.75
1,700.0	0.82	96.53	1,699.8	6.3	14.4	15.7	0.27	-0.07	-17.38
1,800.0	0.88	89.30	1,799.8	6.2	15.9	17.0	0.12	0.06	-7.23
1,900.0	0.69	69.90	1,899.7	6.4	17.2	18.4	0.32	-0.19	-19.40
TIE IN @ 1915' MD / 1915' TVD									
1,915.0	0.89	83.88	1,914.7	6.5	17.4	18.6	1.84	1.33	93.20
1,996.0	0.70	102.40	1,995.7	6.5	18.5	19.6	0.39	-0.23	22.86
2,028.0	1.70	262.90	2,027.7	6.3	18.2	19.3	7.41	3.13	501.56
2,059.0	4.80	267.90	2,058.7	6.2	16.5	17.6	10.03	10.00	16.13
2,091.0	6.90	266.30	2,090.5	6.1	13.2	14.5	6.58	6.56	-5.00
2,123.0	9.70	270.50	2,122.2	6.0	8.6	10.1	8.95	8.75	13.13
2,155.0	13.40	274.90	2,153.5	6.3	2.2	4.3	11.88	11.56	13.75
CROSSED HARDLINE @ 2157.2' MD / 2155.7' TVD									
2,157.2	13.65	274.96	2,155.7	6.4	1.7	3.8	11.31	11.29	2.78
2,186.0	16.90	275.60	2,183.4	7.1	-5.9	-3.0	11.31	11.29	2.22
2,218.0	20.80	275.80	2,213.7	8.1	-16.2	-12.3	12.19	12.19	0.63
2,250.0	23.90	274.90	2,243.3	9.2	-28.3	-23.3	9.75	9.69	-2.81
2,281.0	26.60	274.00	2,271.3	10.2	-41.5	-35.3	8.80	8.71	-2.90
2,313.0	29.30	273.00	2,299.6	11.1	-56.4	-49.0	8.56	8.44	-3.13
2,345.0	33.20	271.90	2,327.0	11.8	-73.0	-64.3	12.32	12.19	-3.44
2,376.0	36.20	270.30	2,352.4	12.2	-90.6	-80.7	10.11	9.68	-5.16
2,408.0	40.00	270.00	2,377.6	12.2	-110.4	-99.1	11.89	11.88	-0.94
2,440.0	44.00	268.90	2,401.4	12.0	-131.8	-119.3	12.71	12.50	-3.44
2,471.0	48.00	269.30	2,422.9	11.7	-154.1	-140.3	12.94	12.90	1.29
2,503.0	52.40	269.10	2,443.4	11.3	-178.7	-163.4	13.76	13.75	-0.63
2,534.0	56.30	268.40	2,461.5	10.8	-203.8	-187.2	12.71	12.58	-2.26
2,566.0	60.40	269.30	2,478.3	10.2	-231.1	-212.9	13.03	12.81	2.81
2,598.0	64.40	270.30	2,493.1	10.1	-259.4	-239.5	12.80	12.50	3.13
2,629.0	68.10	270.80	2,505.6	10.4	-287.8	-266.0	12.03	11.94	1.61
2,661.0	71.80	271.00	2,516.5	10.9	-317.8	-294.0	11.58	11.56	0.63
2,693.0	74.30	271.20	2,525.9	11.5	-348.4	-322.4	7.84	7.81	0.63
2,724.0	77.40	271.20	2,533.4	12.1	-378.5	-350.4	10.00	10.00	0.00
2,756.0	81.90	271.20	2,539.2	12.8	-410.0	-379.6	14.06	14.06	0.00
2,780.0	84.80	271.40	2,542.0	13.3	-433.8	-401.7	12.11	12.08	0.83
2,843.0	83.00	269.30	2,548.7	13.7	-496.4	-460.3	4.38	-2.86	-3.33
2,874.0	81.90	270.10	2,552.7	13.5	-527.2	-489.1	4.37	-3.55	2.58
2,907.0	81.50	269.60	2,557.5	13.4	-559.8	-519.8	1.93	-1.21	-1.52

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Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

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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)
2,939.0	83.20	268.70	2,561.8	13.0	-591.5	-549.6	6.00	5.31	-2.81
2,971.0	87.10	268.40	2,564.5	12.2	-623.4	-579.8	12.22	12.19	-0.94
3,002.0	90.70	269.10	2,565.1	11.5	-654.4	-609.0	11.83	11.61	2.26
3,034.0	90.90	269.60	2,564.6	11.1	-686.4	-639.1	1.68	0.63	1.56
3,066.0	91.10	269.60	2,564.0	10.9	-718.4	-669.2	0.63	0.63	0.00
3,098.0	91.50	270.70	2,563.3	11.0	-750.3	-699.1	3.66	1.25	3.44
3,130.0	91.80	270.50	2,562.4	11.3	-782.3	-729.0	1.13	0.94	-0.63
3,162.0	91.90	270.10	2,561.4	11.5	-814.3	-758.9	1.29	0.31	-1.25
3,194.0	92.10	270.30	2,560.3	11.6	-846.3	-788.8	0.88	0.63	0.63
3,226.0	92.30	270.30	2,559.0	11.8	-878.3	-818.7	0.63	0.63	0.00
3,258.0	91.70	270.70	2,557.9	12.0	-910.2	-848.6	2.25	-1.88	1.25
3,289.0	91.50	270.50	2,557.0	12.4	-941.2	-877.5	0.91	-0.65	-0.65
3,321.0	91.20	270.50	2,556.3	12.6	-973.2	-907.3	0.94	-0.94	0.00
3,353.0	91.10	270.00	2,555.6	12.8	-1,005.2	-937.3	1.59	-0.31	-1.56
3,384.0	90.90	269.80	2,555.1	12.7	-1,036.2	-966.3	0.91	-0.65	-0.65
3,416.0	90.90	270.00	2,554.6	12.7	-1,068.2	-996.3	0.62	0.00	0.63
3,448.0	90.90	270.10	2,554.1	12.7	-1,100.2	-1,026.3	0.31	0.00	0.31
3,480.0	90.70	271.40	2,553.7	13.1	-1,132.2	-1,056.1	4.11	-0.63	4.06
3,512.0	90.70	271.20	2,553.3	13.8	-1,164.2	-1,085.8	0.62	0.00	-0.63
3,544.0	90.40	270.70	2,553.0	14.4	-1,196.2	-1,115.6	1.82	-0.94	-1.56
3,576.0	90.00	270.30	2,552.8	14.7	-1,228.2	-1,145.5	1.77	-1.25	-1.25
3,608.0	89.90	270.70	2,552.9	14.9	-1,260.2	-1,175.4	1.29	-0.31	1.25
3,640.0	89.90	270.80	2,552.9	15.4	-1,292.2	-1,205.2	0.31	0.00	0.31
3,671.0	90.20	270.80	2,552.9	15.8	-1,323.2	-1,234.1	0.97	0.97	0.00
3,703.0	90.10	270.80	2,552.8	16.2	-1,355.2	-1,263.9	0.31	-0.31	0.00
3,735.0	90.00	270.70	2,552.8	16.6	-1,387.2	-1,293.8	0.44	-0.31	-0.31
3,767.0	89.70	270.70	2,552.9	17.0	-1,419.2	-1,323.6	0.94	-0.94	0.00
3,799.0	89.60	270.80	2,553.1	17.5	-1,451.2	-1,353.4	0.44	-0.31	0.31
3,831.0	90.40	271.00	2,553.1	18.0	-1,483.2	-1,383.2	2.58	2.50	0.63
3,862.0	90.50	270.50	2,552.8	18.4	-1,514.2	-1,412.1	1.64	0.32	-1.61
3,894.0	90.70	270.50	2,552.5	18.6	-1,546.2	-1,442.0	0.63	0.63	0.00
3,926.0	91.30	270.50	2,551.9	18.9	-1,578.1	-1,471.9	1.88	1.88	0.00
3,958.0	91.40	270.10	2,551.2	19.1	-1,610.1	-1,501.8	1.29	0.31	-1.25
3,989.0	91.50	270.30	2,550.4	19.2	-1,641.1	-1,530.8	0.72	0.32	0.65
4,021.0	91.30	269.10	2,549.6	19.0	-1,673.1	-1,560.8	3.80	-0.63	-3.75
4,053.0	91.50	269.40	2,548.8	18.6	-1,705.1	-1,590.9	1.13	0.63	0.94
4,084.0	91.40	268.50	2,548.0	18.0	-1,736.1	-1,620.1	2.92	-0.32	-2.90
4,116.0	91.30	270.00	2,547.3	17.6	-1,768.1	-1,650.3	4.70	-0.31	4.69
4,148.0	91.10	269.60	2,546.6	17.5	-1,800.1	-1,680.3	1.40	-0.63	-1.25
4,180.0	91.00	269.40	2,546.0	17.2	-1,832.1	-1,710.3	0.70	-0.31	-0.63
4,212.0	90.80	269.30	2,545.5	16.9	-1,864.1	-1,740.4	0.70	-0.63	-0.31
4,244.0	90.50	270.00	2,545.2	16.7	-1,896.1	-1,770.5	2.38	-0.94	2.19
4,276.0	89.80	269.60	2,545.1	16.6	-1,928.1	-1,800.5	2.52	-2.19	-1.25
4,308.0	90.00	269.40	2,545.1	16.3	-1,960.1	-1,830.6	0.88	0.63	-0.63

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4,339.0	89.60	268.70	2,545.2	15.8	-1,991.0	-1,859.8	2.60	-1.29	-2.26
4,371.0	90.10	269.40	2,545.3	15.2	-2,023.0	-1,890.0	2.69	1.56	2.19
4,403.0	90.10	269.40	2,545.3	14.9	-2,055.0	-1,920.1	0.00	0.00	0.00
4,435.0	90.70	270.30	2,545.1	14.8	-2,087.0	-1,950.1	3.38	1.88	2.81
4,467.0	90.60	270.30	2,544.7	15.0	-2,119.0	-1,980.0	0.31	-0.31	0.00
4,498.0	90.90	270.00	2,544.3	15.1	-2,150.0	-2,009.0	1.37	0.97	-0.97
4,529.0	91.20	270.70	2,543.7	15.3	-2,181.0	-2,038.0	2.46	0.97	2.26
4,560.0	91.00	270.30	2,543.1	15.5	-2,212.0	-2,066.9	1.44	-0.65	-1.29
4,592.0	91.40	270.70	2,542.4	15.8	-2,244.0	-2,096.8	1.77	1.25	1.25
4,624.0	91.50	270.10	2,541.6	16.0	-2,276.0	-2,126.7	1.90	0.31	-1.88
4,656.0	90.50	269.80	2,541.1	16.0	-2,308.0	-2,156.7	3.26	-3.13	-0.94
4,688.0	90.30	269.80	2,540.9	15.9	-2,340.0	-2,186.7	0.63	-0.63	0.00
4,719.0	90.00	269.10	2,540.8	15.6	-2,371.0	-2,215.8	2.46	-0.97	-2.26
4,751.0	90.40	269.40	2,540.7	15.2	-2,403.0	-2,245.9	1.56	1.25	0.94
4,783.0	90.30	268.70	2,540.5	14.6	-2,435.0	-2,276.1	2.21	-0.31	-2.19
4,815.0	90.20	268.40	2,540.3	13.8	-2,467.0	-2,306.4	0.99	-0.31	-0.94
4,847.0	90.90	269.30	2,540.0	13.2	-2,499.0	-2,336.5	3.56	2.19	2.81
4,878.0	91.10	269.30	2,539.5	12.8	-2,530.0	-2,365.7	0.65	0.65	0.00
4,911.0	90.80	268.20	2,538.9	12.1	-2,562.9	-2,396.9	3.45	-0.91	-3.33
4,943.0	90.80	269.40	2,538.5	11.4	-2,594.9	-2,427.1	3.75	0.00	3.75
4,973.0	90.60	269.40	2,538.1	11.1	-2,624.9	-2,455.3	0.67	-0.67	0.00
5,003.0	90.00	269.40	2,538.0	10.8	-2,654.9	-2,483.5	2.00	-2.00	0.00
5,035.0	90.60	270.70	2,537.8	10.8	-2,686.9	-2,513.5	4.47	1.88	4.06
5,065.0	90.50	269.80	2,537.5	11.0	-2,716.9	-2,541.5	3.02	-0.33	-3.00
5,096.0	90.60	269.60	2,537.2	10.8	-2,747.9	-2,570.6	0.72	0.32	-0.65
5,128.0	90.80	269.40	2,536.8	10.5	-2,779.9	-2,600.7	0.88	0.63	-0.63
5,159.0	91.50	271.40	2,536.2	10.7	-2,810.9	-2,629.7	6.83	2.26	6.45
5,190.0	91.40	271.70	2,535.4	11.6	-2,841.9	-2,658.4	1.02	-0.32	0.97
5,221.0	91.40	271.20	2,534.7	12.4	-2,872.9	-2,687.1	1.61	0.00	-1.61
5,252.0	91.40	271.40	2,533.9	13.1	-2,903.9	-2,715.9	0.64	0.00	0.65
5,282.0	91.20	270.70	2,533.2	13.6	-2,933.8	-2,743.8	2.43	-0.67	-2.33
5,314.0	90.20	270.70	2,532.8	14.0	-2,965.8	-2,773.7	3.13	-3.13	0.00
5,345.0	90.00	270.50	2,532.8	14.3	-2,996.8	-2,802.6	0.91	-0.65	-0.65
5,376.0	89.60	270.70	2,532.9	14.6	-3,027.8	-2,831.5	1.44	-1.29	0.65
5,408.0	90.00	270.80	2,533.0	15.1	-3,059.8	-2,861.3	1.29	1.25	0.31
5,438.0	90.40	270.50	2,532.9	15.4	-3,089.8	-2,889.3	1.67	1.33	-1.00
5,469.0	90.90	271.00	2,532.5	15.8	-3,120.8	-2,918.2	2.28	1.61	1.61
5,501.0	89.90	270.10	2,532.3	16.1	-3,152.8	-2,948.1	4.20	-3.13	-2.81
5,532.0	89.40	269.60	2,532.5	16.0	-3,183.8	-2,977.2	2.28	-1.61	-1.61
5,563.0	90.50	270.00	2,532.5	15.9	-3,214.8	-3,006.2	3.78	3.55	1.29
5,595.0	90.90	270.10	2,532.1	16.0	-3,246.8	-3,036.2	1.29	1.25	0.31
5,625.0	92.20	270.70	2,531.3	16.2	-3,276.8	-3,064.2	4.77	4.33	2.00
5,656.0	92.20	271.00	2,530.1	16.6	-3,307.8	-3,093.1	0.97	0.00	0.97

Company:	Nadel & Gussman HEYCO, LLC	**Local Co-ordinate Reference:**	Well Cannonball #1H
Project:	Eddy County, New Mexico (NAD83)	**TVD Reference:**	WELL @ 3412.8usft (Original Well Elev)
Site:	Sec 20, T18S, 26E	**MD Reference:**	WELL @ 3412.8usft (Original Well Elev)
Well:	Cannonball #1H	**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)
5,688.0	92.10	270.30	2,528.9	17.0	-3,339.7	-3,122.9	2.21	-0.31	-2.19
5,719.0	92.50	270.70	2,527.7	17.3	-3,370.7	-3,151.8	1.82	1.29	1.29
5,748.0	92.30	270.30	2,526.5	17.5	-3,399.7	-3,178.9	1.54	-0.69	-1.38
5,780.0	92.10	269.80	2,525.2	17.5	-3,431.7	-3,208.8	1.68	-0.63	-1.56
5,811.0	91.60	270.80	2,524.2	17.7	-3,462.7	-3,237.8	3.61	-1.61	3.23
5,842.0	91.10	270.80	2,523.5	18.1	-3,493.6	-3,266.7	1.61	-1.61	0.00
5,874.0	91.50	271.50	2,522.8	18.8	-3,525.6	-3,296.4	2.52	1.25	2.19
5,904.0	91.40	271.00	2,522.0	19.4	-3,555.6	-3,324.3	1.70	-0.33	-1.67
5,933.0	91.10	271.00	2,521.4	19.9	-3,584.6	-3,351.3	1.03	-1.03	0.00
5,965.0	90.30	270.80	2,521.0	20.4	-3,616.6	-3,381.1	2.58	-2.50	-0.63
5,995.0	90.70	270.70	2,520.7	20.8	-3,646.6	-3,409.0	1.37	1.33	-0.33
6,027.0	90.70	270.70	2,520.4	21.2	-3,678.6	-3,438.9	0.00	0.00	0.00
6,058.0	91.30	270.80	2,519.8	21.6	-3,709.6	-3,467.8	1.96	1.94	0.32
6,089.0	91.40	271.40	2,519.1	22.2	-3,740.6	-3,496.6	1.96	0.32	1.94
6,119.0	91.80	271.70	2,518.2	23.0	-3,770.5	-3,524.4	1.67	1.33	1.00
6,151.0	91.10	270.80	2,517.4	23.7	-3,802.5	-3,554.1	3.56	-2.19	-2.81
6,181.0	90.10	270.00	2,517.1	23.9	-3,832.5	-3,582.1	4.27	-3.33	-2.67
6,212.0	90.30	270.80	2,517.0	24.2	-3,863.5	-3,611.1	2.66	0.65	2.58
6,244.0	89.60	270.50	2,517.0	24.5	-3,895.5	-3,640.9	2.38	-2.19	-0.94
6,273.0	88.90	269.40	2,517.4	24.5	-3,924.5	-3,668.1	4.50	-2.41	-3.79
6,304.0	88.60	269.10	2,518.1	24.1	-3,955.5	-3,697.3	1.37	-0.97	-0.97
6,335.0	89.90	269.80	2,518.5	23.8	-3,986.5	-3,726.4	4.76	4.19	2.26
6,367.0	90.60	270.00	2,518.4	23.7	-4,018.5	-3,756.4	2.28	2.19	0.63
6,399.0	90.80	270.50	2,518.0	23.9	-4,050.5	-3,786.4	1.68	0.63	1.56
6,431.0	90.50	270.00	2,517.6	24.0	-4,082.5	-3,816.3	1.82	-0.94	-1.56
6,463.0	91.00	270.50	2,517.2	24.2	-4,114.5	-3,846.2	2.21	1.56	1.56
6,494.0	90.70	270.10	2,516.7	24.3	-4,145.5	-3,875.2	1.61	-0.97	-1.29
6,526.0	89.50	270.00	2,516.7	24.3	-4,177.5	-3,905.2	3.76	-3.75	-0.31
6,558.0	88.40	268.90	2,517.3	24.0	-4,209.5	-3,935.3	4.86	-3.44	-3.44
6,590.0	88.50	268.90	2,518.1	23.4	-4,241.5	-3,965.4	0.31	0.31	0.00
6,621.0	90.60	269.80	2,518.4	23.1	-4,272.5	-3,994.6	7.37	6.77	2.90
6,653.0	91.30	270.80	2,517.8	23.2	-4,304.4	-4,024.5	3.81	2.19	3.13
6,685.0	90.80	270.50	2,517.3	23.6	-4,336.4	-4,054.4	1.82	-1.56	-0.94
6,717.0	90.30	270.50	2,516.9	23.9	-4,368.4	-4,084.2	1.56	-1.56	0.00
6,748.0	90.80	270.30	2,516.7	24.1	-4,399.4	-4,113.2	1.74	1.61	-0.65
6,780.0	93.10	272.10	2,515.6	24.8	-4,431.4	-4,142.9	9.12	7.19	5.63
6,812.0	92.80	271.20	2,513.9	25.7	-4,463.4	-4,172.5	2.96	-0.94	-2.81
6,844.0	92.80	271.00	2,512.4	26.3	-4,495.3	-4,202.2	0.62	0.00	-0.63
6,875.0	90.90	271.00	2,511.4	26.8	-4,526.3	-4,231.1	6.13	-6.13	0.00
TD @ 6932' MD / 2511' TVD									
6,932.0	90.90	271.00	2,510.5	27.8	-4,583.3	-4,284.1	0.00	0.00	0.00

Company:	Nadel & Gussman HEYCO, LLC	**Local Co-ordinate Reference:**	Well Cannonball #1H
Project:	Eddy County, New Mexico (NAD83)	**TVD Reference:**	WELL @ 3412.8usft (Original Well Elev)
Site:	Sec 20, T18S, 26E	**MD Reference:**	WELL @ 3412.8usft (Original Well Elev)
Well:	Cannonball #1H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Wellbore #1	**Database:**	EDM 5000.1 Single User Db

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1,915.0	1,914.7	6.5	17.4	TIE IN @ 1915' MD / 1915' TVD
2,157.2	2,155.7	6.4	1.7	CROSSED HARDLINE @ 2157.2' MD / 2155.7' TVD
6,932.0	2,510.5	27.8	-4,583.3	TD @ 6932' MD / 2511' TVD

Checked By: _____ Approved By: _____ Date: _____

Company: Nadel and Gussman Heyco LLC
Lease/Well: Cannonball / No. 001H
Location: S20 T18 R26e
Rig Name: Patriot 1
State/County: New Mexico / Eddy
Latitude: 32.73, Longitude: -104.40
GRID North is 0.03 Degrees West of True North
VS-Azi: 0.00 Degrees

NOV 26 2012

RKB : 18.5'

DRILLOG HA GYRO SURVEY CALCULATIONS
Filename: cannonball #1h gyro survey.ut
Minimum Curvature Method
Report Date/Time: 11/20/2012 / 09:06

Vaughn Energy Services
Gardendale, Texas
432-563-5444
Surveyor: Dustin Wedel
Cannonball No. 001H / API 30-015-38569

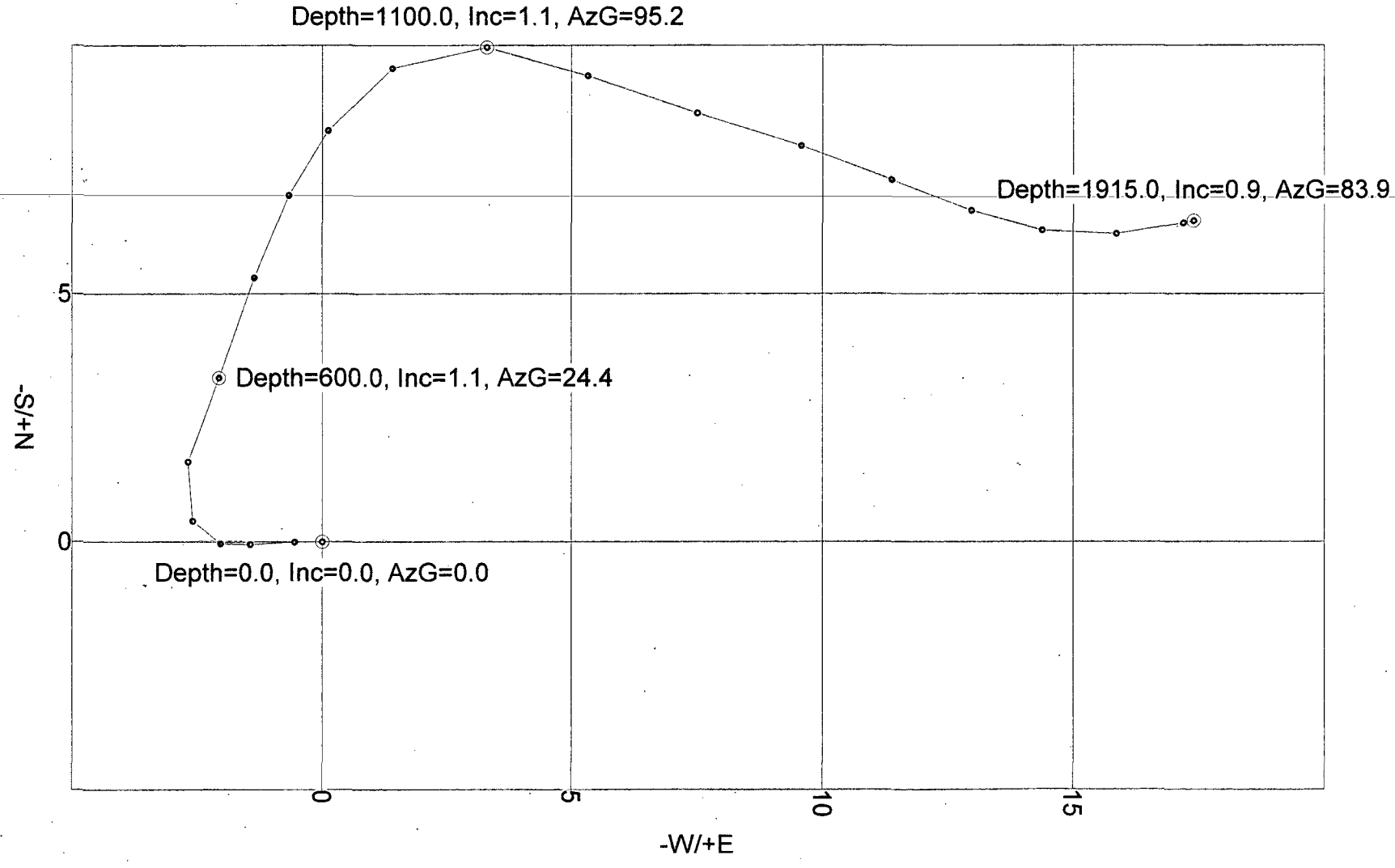
Measured Depth FT	Incl Angle Deg	Drift Direction Deg	TVD FT	+N/-S FT	+E/-W FT	Vertical Section FT	Closure Distance FT	Closure Direction Deg	Dogleg Severity Deg/100
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	****
100.00	0.63	269.59	100.00	0.00	-0.55	0.00	0.55	269.59	0.63
200.00	0.39	262.94	199.99	-0.05	-1.44	-0.05	1.44	268.01	0.24
300.00	0.31	282.32	299.99	-0.03	-2.04	-0.03	2.04	269.02	0.15
400.00	0.57	323.15	399.99	0.42	-2.60	0.42	2.64	279.16	0.39
500.00	0.94	14.70	499.98	1.61	-2.70	1.61	3.14	300.82	0.73
600.00	1.15	24.36	599.97	3.31	-2.08	3.31	3.91	327.89	0.27
700.00	1.31	15.46	699.94	5.32	-1.36	5.32	5.49	345.67	0.25
800.00	0.78	34.19	799.93	6.98	-0.67	6.98	7.01	354.49	0.63
900.00	0.97	28.87	899.91	8.28	0.12	8.28	8.28	0.80	0.21
1000.00	1.18	60.38	999.90	9.53	1.42	9.53	9.64	8.47	0.62
1100.00	1.14	95.17	1099.88	9.95	3.31	9.95	10.49	18.39	0.70
1200.00	1.30	115.13	1199.86	9.38	5.33	9.38	10.79	29.59	0.45
1300.00	1.35	103.39	1299.83	8.63	7.50	8.63	11.43	40.98	0.28
1400.00	1.15	112.33	1399.81	7.97	9.57	7.97	12.46	50.21	0.28
1500.00	1.05	109.16	1499.79	7.29	11.38	7.29	13.51	57.35	0.12
1600.00	0.89	113.91	1599.77	6.67	12.96	6.67	14.57	62.75	0.18
1700.00	0.82	96.53	1699.76	6.28	14.38	6.28	15.69	66.42	0.27
1800.00	0.88	89.30	1799.75	6.20	15.86	6.20	17.03	68.63	0.12

VES Survey Date: 11/06/2012

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
1900.00	0.69	69.90	1899.74	6.42	17.19	6.42	18.35	69.52	0.32
1915.00	0.89	83.88	1914.74	6.46	17.39	6.46	18.56	69.61	1.83

VES Survey Date: 11/06/2012

Vaughn Energy Services
Gardendale, Texas
432-563-5444
Surveyor: Dustin Wedel
Cannonball No. 001H / API 30-015-38569



VES Survey Date: 11/06/2012

Packers Plus®

Do It Once
Do It Right

Operator:	Nadel and Gussman	**Base Point:**	20410 Midland
Company Rep:	Dennis Pomroy	**Packers Plus Rep:**	Sal Ramirez/ Tommy Gonzalez
Well Name:	Cannonball #1H	**Date Started:**	11.16.2012
Ticket Number:	SOU005999	**Date Completed:**	11.18.2012
County/State:	Eddy County, NM	**Type of Job:**	StackFrac HD

DETAIL THE JOB - THIS FORM USED TO REPORT WHAT ACTUALLY TOOK PLACE - FILL OUT COMPLETELY

DATE	TIME	
11/16/12		
	17:25	Arrived on location, Checked in with company representative Dennis Pomroy
		Received well information, Checked tool inventory OD, ID and drift tools
		Rig at depth of 6252' drilling hole to 6935' Reamer gauged at 6"
		104 joints of 4.5", 13.5#, LTC, L-80 casing on location.
11/17/12		
	11:00	On bottom with directional tools. TD at 6933' pump sweep and 55 galllons of gel lubricants
	12:00	Begin tripping out of hole with directional tools.
	14:55	Directional tools above floor, laying down.
	16:16	Make up BHA: 6 1/8" Bit 72 Stands in Derrick
		Bit Sub
		1 joint of drill pipe
		6' reamer
		Run 28 stands of drill pipe to shoe.
	17:10	At shoe with reamer, 2825' Pick Up- 38K Slack off 35K, Run 44 Stands to bottom.
	19:27	On bottom with reamer, 6933' Circulate pumping Hi/Low Vis sweeps 120 Spm 925 psi
		65 Rpm, will drop 1 7/8" rabbit before they begin tripping out of hole, PU 81K SO 40K
		Reamer went straight to bottom, did not tag any tight spots, will come out of hole with reamer
	21:25	Begin tripping ouit of hole with reamer, rabbit dropped, Pull 30 Stands then lay down rest of drill pipe (42 Stands)
11/18/12	1:10	Out of hole with reamer and rabbit, reamer gauged at 5.95"
		Rig up casers, Move Packers Plus tools by catwalk.
	2:35	Held safety meeting with rig and casing crews, running speed, dope pins, collars clamps
		will fill every 20 joints with KCL water, stop work authority
	3:01	Toe Circulating Sub Picked up, filled with water to check floats, looked good, Run 2 joints
	3:25	DEH Frac port in hole/ run 2 joints
	3:35	RSIIS in hole/ run 2 joints
	3:42	RSII in hole/ run 2 joints
	3:51	1.250" FP in hole/ run 2 joints
	3:57	RSII in hole/ run 2 joints
	4:05	1.375" FP in hole/ run 2 joints
	4:12	RSII in hole/ run 2 joints
	4:19	1.50" FP in hole/ run 2 joints
	4:27	RSII in hole/ run 2 joints Fill pipe
	4:52	1.625FP in hole/ run 2 joints
	4:58	RSII in hole/ run 2 joints
	5:03	1.750"FP in hole/ run 2 joints
	5:08	RSII in hole/ run 2 joint
	5:13	1.875"FP in hole/ run 2 joints
	5:19	RSII in hole/ run 2 joints
	5:24	2.000FP in hole/ run 2 joints
	5:29	RSII in hole/ run 2 joints
	5:35	2.125FP in hole/ run 2 joints
	5:39	RSII in hole/ run 2 joints Fill pipe

Packers Plus®

Do It Once
Do It Right

Operator:	Nadel and Gussman	**Base Point:**	20410 Midland
Company Rep:	Dennis Pomroy	**Packers Plus Rep:**	Sal Ramirez/ Tommy Gonzalez
Well Name:	Cannonball #1H	**Date Started:**	11.16.2012
Ticket Number:	SOU005999	**Date Completed:**	11.18.2012
County/State:	**Eddy County, NM**	**Type of Job:**	StackFrac HD

DATE	TIME	
	5:52	2.25FP in hole/ run 2 joints
	5:57	RSII in hole/ run 2 joints
	6:02	2.375FP in hole/ run 2 joints
	6:08	RSII in hole/ run 2 joints
	6:13	2.50FP in hole/ run 2 joints
	6:18	RSII in hole/ run 2 joints
	6:24	2.625FP in hole/ run 2 joints
	6:28	RSII in hole/ run 2 joints
	6:32	2.75FP in hole/ run 2 joints
	6:37	RSII in hole/ run 2 joints
		At shoe with system 2825', Break circulation .5 Bpm @ 85 psi, Good returns P/U 32K
	6:57	2.875FP in hole/ run 2 joints S/O 25K
	7:02	RSII in hole/ run 2 joints
	7:06	3.00FP in hole/ run 2 joints
	7:10	RSII in hole/ run 2 joints
	7:14	3.125FP in hole/ run 2 joints
	7:18	RSII in hole/ run 2 joints
	7:22	3.250FP in hole/ run 2 joints
	7:28	RSII in hole/ run 2 joints
	7:32	3.375FP in hole/ run 2 joints
	7:36	RSII in hole/ run 4 joints
	7:43	3.500FP in hole/ run 4 joints
	7:50	RSII in hole/ run 12 joints
	8:10	Setting tool made up, picked up to where it would be out of the B.O.P when we go to break circulation, fill pipe, rig down casing crew and laydown machine pipe full circulating at 1 bpm @ 115 psi, good returns then shut down and bleed off psi start tripping in with stands, running speed at 1 1/2min per stand, Pick up- 45K Slack off- 27K
	8:51	Begin running dp and drill collars to setting depth. Run 4 Dp then 15 stands of Drill collars and 5 stands of drill pipe and a double to reach setting depth.
	9:50	At setting depth with system, 6850' Pick up 75K Slack off 30K, fill pipe, establish circulation 3 Bpm @ 350psi, Pumping 20 bbls ahead, getting good returns
	10:17	Drop (2) 1.25" balls, Displace balls with 84 BBls (calculated) pumping fresh water.
	10:50	Ball landed with 83 BBls pumped, 3 Bpm @ 350 psi ISDP-1000 psi Walk pressure up to 1900 psi to set SF hanger, hold 15 minuntes,
	11:00	Pull/push test, Neutral Wt. 63K (calculated) Pull 60K over Neutral Wt. to 123K and slacked off 30K under Neutral Wt. to 33K Pull 60K over Neutral Wt. to 123K and slacked off 30K under Neutral Wt. to 33K Pipe stretch- 19 in, Shut in drill pipe pressure
	11:15	Pressure on backside to 2500 psi, Hold 15 minutes, test good, Bleed off
	11:40	Get back on drill pipe and pressure to 2200 psi to set packers. Hold 15 minutes. Test good Bleed off drill pipe pressure
	11:55	With system in Neutral, 63K, Rotate out of SF Hanger. 5 turns to right and 1/2 back, 5 turns to right and 0 back 5 turns to right and 0 back
	12:00	Pick up on string and free from Hanger. String Wt. 55K Displace remainder of well. Rig down pump truck. Rig up lay down truck.

Packers Plus®

Do It Once
Do It Right

Operator:	Nadel and Gussman	**Base Point:**	20410 Midland
Company Rep:	Dennis Pomroy	**Packers Plus Rep:**	Sal Ramirez/ Tommy Gonzalez
Well Name:	Cannonball #1H	**Date Started:**	11.16.2012
Ticket Number:	SOU005999	**Date Completed:**	11.18.2012
County/State:	**Eddy County, NM**	**Type of Job:**	StackFrac HD

DATE	TIME	
		Begin laying down drill pipe Setting tool out of hole, tool checked ok, Annular was NOT sheared, laid down Paperwork signed and released from location

Packers Plus®

Do It Once
Do It Right

Operator:	Nadel and Gussman	**Base Point:**	20410 Midland
Company Rep:	Dennis Pomroy	**Packers Plus Rep:**	Sal Ramirez/ Tommy Gonzalez
Well Name:	Cannonball #1H	**Date Started:**	11.16.2012
Ticket Number:	SOU005999	**Date Completed:**	11.18.2012
County/State:	**Eddy County, NM**	**Type of Job:**	StackFrac HD

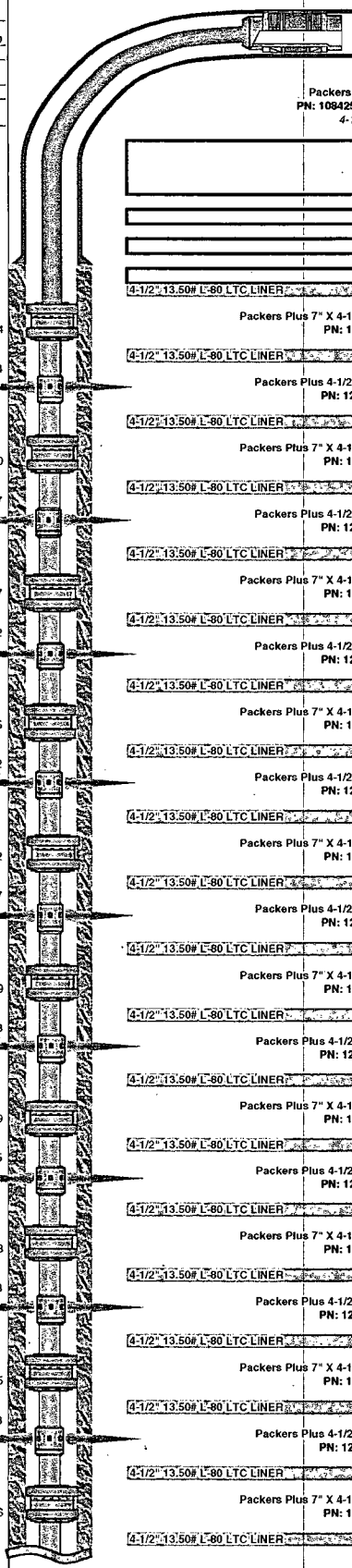
DATE	TIME

Packers Plus — Do It Once. Do It Right.

Confidential Information - not to be disclosed outside Nadel & Gussman

Completion Final

Prepared for	Company	Date
Jason Goss	Nadel & Gussman	18-Nov-12
Well Name	**Location**	**Type of Installation**
Cannonball #1H	Lea County, NM	20-Stage StackFRAC® HD™



Depth (MD/TVD)	Schematic	Description	OD (in.)	ID (in.)	Length (ft)
		Page 1 of 2			
TOL = 2330.20 MD					
89 BBLS					
KOP = 1996' MD					
		Packers Plus 7" X 4.750" X 3.875" SF Liner Hanger Packer	5.870	4.750 3.875	6.28
BR = 8 °/100'		**PN: 108425-000004 3 Pins @ 482 Ea. + 1 Pin @ 241 = 1,687 PSI**			
		4-1/2", 13.5#, L-80, BTC x LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.04
		Serial # SNU0014998			
		Notes:			
		Prod. Liner: 4-1/2", 13.50#, L-80, LTC	***4.500***	***3.920***	
		Int. Casing: 7", 26.0#, L-80	***7.000***	***6.276***	
		Open Hole: 6-1/8" Horizontal Well	***6.125***	***6.125***	
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 12			492.18
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	*4.500*	*3.920*	6.08
2837.78		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070114		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.07
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 4			161.92
HA2001434		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	*4.500*	*3.920*	6.08
STAGE 20		**Packers Plus 4-1/2" Drillable FracPort w/ *3.500" seat* for a 3.625" SF-6 Frac Ball**	5.630	***3.500***	2.65
3,014.10		**PN: 121332-000023 6 Pins @ 314 PSI Ea. = 1,884 PSI**		3.840	
99 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	*4.500*	*3.920*	3.07
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 4			164.19
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	*4.500*	*3.920*	6.08
3190.09		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070120		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.05
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			81.97
EA1037927		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	*4.500*	*3.920*	6.08
STAGE 19		**Packers Plus 4-1/2" Drillable FracPort w/ *3.375" seat* for a 3.500" SF-6 Frac Ball**	5.630	***3.375***	2.65
3,286.44		**PN: 121332-000020 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
103 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	*4.500*	*3.920*	3.05
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.06
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	*4.500*	*3.920*	6.07
3380.27		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EA0070097		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.05
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.13
EA1037962		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	*4.500*	*3.920*	6.09
STAGE 18		**Packers Plus 4-1/2" Drillable FracPort w/ *3.250" seat* for a 3.375" SF-6 Frac Ball**	5.630	***3.250***	2.65
3,476.79		**PN: 121332-000019 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
106 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	*4.500*	*3.920*	3.10
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.04
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	*4.500*	*3.920*	6.04
3570.62		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EA3019425		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.06
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.11
EA1038072		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	*4.500*	*3.920*	6.09
STAGE 17		**Packers Plus 4-1/2" Drillable FracPort w/ *3.125" seat* for a 3.250" SF-6 Frac Ball**	5.630	***3.125***	2.65
3,667.12		**PN: 121332-000018 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
109 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	*4.500*	*3.920*	3.07
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.1
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	*4.500*	*3.920*	6.07
3761.01		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EA0042032		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.06
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.03
EA1037907		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	*4.500*	*3.920*	6.10
STAGE 16		**Packers Plus 4-1/2" Drillable FracPort w/ *3.000" seat* for a 3.125" SF-6 Frac Ball**	5.630	***3.000***	2.65
3,857.45		**PN: 121332-000017 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
112 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	*4.500*	*3.920*	3.06
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.08
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	*4.500*	*3.920*	6.05
3951.29		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070119		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.07
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.06
EA1037948		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	*4.500*	*3.920*	6.06
STAGE 15		**Packers Plus 4-1/2" Drillable FracPort w/ *2.875" seat* for a 3.000" SF-6 Frac Ball**	5.630	***2.875***	2.65
4,047.73		**PN: 121332-000016 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
115 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	*4.500*	*3.920*	3.07
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.12
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	*4.500*	*3.920*	6.09
4141.66		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070099		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.07
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.09
EA1037975		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	*4.500*	*3.920*	6.06
STAGE 14		**Packers Plus 4-1/2" Drillable FracPort w/ *2.750" seat* for a 2.875" SF-6 Frac Ball**	5.630	***2.750***	2.65
4,238.13		**PN: 121332-000015 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
117 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	*4.500*	*3.920*	3.06
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.11
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	*4.500*	*3.920*	6.02
4331.97		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070098		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.08
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.1
EA1037928		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	*4.500*	*3.920*	6.02
STAGE 13		**Packers Plus 4-1/2" Drillable FracPort w/ *2.625" seat* for a 2.750" SF-6 Frac Ball**	5.630	***2.625***	2.65
4,428.42		**PN: 121332-000014 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
120 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	*4.500*	*3.920*	3.06
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.04
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	*4.500*	*3.920*	6.04
4522.21		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070115		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.07
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.08
EA1038053		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	*4.500*	*3.920*	6.06
STAGE 12		**Packers Plus 4-1/2" Drillable FracPort w/ *2.500" seat* for a 2.625" SF-6 Frac Ball**	5.630	***2.500***	2.65
4,618.67		**PN: 121332-000013 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
123 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	*4.500*	*3.920*	3.08
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.09
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	*4.500*	*3.920*	6.08
4712.57		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070106		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	*4.500*	*3.920*	3.07
		4-1/2" 13.50# L-80 LTC LINER — JOINTS: 2			82.02

Service Center	Telephone	Contact	Sales Contact
Midland, TX	432-563-8024	Keith Martin	Don McLean (281-610-6900)

Packers Plus — Do It Once. Do It Right.

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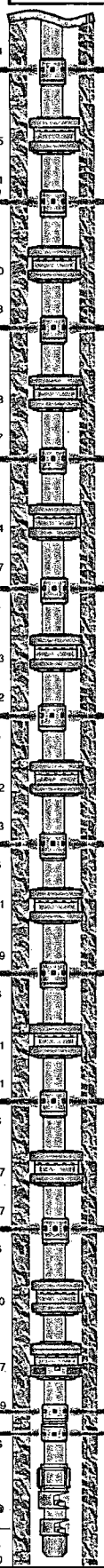
Completion Final

Prepared for	Company	Date
Jason Goss	Nadel & Gussman	18-Nov-12
Well Name	**Location**	**Type of Installation**
Cannonball #1H	Lea County, NM	20-Stage StackFRAC® HD™

Depth (MD/TVD)	Schematic	Description	OD (in.)	ID (in.)	Length (ft)
EM0043174		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.06
STAGE 11		**Packers Plus 4-1/2" Drillable FracPort w/ *2.375" seat* for a 2.500" SF-6 Frac Ball**	5.630	***2.375***	2.65
4,808.97		**PN: 121332-000012 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
126 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.08
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.06
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.08
4902.84		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070105		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.09
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.10
EM0038091		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.04
STAGE 10		**Packers Plus 4-1/2" Drillable FracPort w/ *2.250" seat* for a 2.375" SF-6 Frac Ball**	5.630	***2.250***	2.65
4,999.32		**PN: 121332-000011 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
129 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.04
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.11
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.06
5093.18		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070100		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.08
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.03
EA1038033		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.04
STAGE 9		**Packers Plus 4-1/2" Drillable FracPort w/ *2.125" seat* for a 2.250" SF-6 Frac Ball**	5.630	***2.125***	2.65
5,189.58		**PN: 121332-000010 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
132 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.04
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.03
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.07
5283.37		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070108		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.07
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.14
EA1040417		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.02
STAGE 8		**Packers Plus 4-1/2" Drillable FracPort w/ *2.000" seat* for a 2.125" SF-6 Frac Ball**	5.630	**2.000**	2.65
5,379.85		**PN: 121332-000009 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
134 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.07
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.09
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.08
5473.74		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070104		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.05
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.03
EM0045157		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.04
STAGE 7		**Packers Plus 4-1/2" Drillable FracPort w/ *1.875" seat* for a 2.000" SF-6 Frac Ball**	5.630	***1.875***	2.65
5,570.11		**PN: 121332-000008 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
137 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.08
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.09
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.04
5663.97		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070103		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.06
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.02
EM0038102		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.06
STAGE 6		**Packers Plus 4-1/2" Drillable FracPort w/ *1.750" seat* for a 1.875" SF-6 Frac Ball**	5.630	***1.750***	2.65
5,760.36		**PN: 121332-000007 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
140 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.04
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.02
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.07
5854.14		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070102		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.07
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.10
EA1032993		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.07
STAGE 5		**Packers Plus 4-1/2" Drillable FracPort w/ *1.625" seat* for a 1.750" SF-6 Frac Ball**	5.630	***1.625***	2.65
5,950.63		**PN: 121332-000006 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
143 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.06
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.10
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.05
6044.49		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070121		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.06
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.08
EM0043159		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.07
STAGE 4		**Packers Plus 4-1/2" Drillable FracPort w/ *1.500" seat* for a 1.625" SF-6 Frac Ball**	5.630	***1.500***	2.65
6,140.95		**PN: 121332-000005 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
146 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.06
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.05
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.04
6234.75		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070101		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.06
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.06
EM0057151		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.06
STAGE 3		**Packers Plus 4-1/2" Drillable FracPort w/ *1.375" seat* for a 1.500" SF-6 Frac Ball**	5.630	***1.375***	2.65
6,331.18		**PN: 121332-000004 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
153 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.08
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.07
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.09
6425.07		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EM0070107		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.05
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.07
EM0034477		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.07
STAGE 2		**Packers Plus 4-1/2" Drillable FracPort w/ *1.250" seat* for a 1.375" SF-6 Frac Ball**	5.630	***1.250***	2.65
6,521.51		**PN: 121332-000003 6 Pins @ 315 PSI Ea. = 1,890 PSI**		3.840	
152 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.07
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.05
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.06
6615.34		**Packers Plus 7" X 4-1/2" RockSeal II 10K Hydraulic-Set Centralized Open Hole Packer**	5.750	3.875	5.25
EA3024450		**PN: 104485-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.09
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.05
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.04
6711.77		**Packers Plus 7" X 4-1/2" RockSeal IIS 10K Hydraulic-Set Open Hole Anchor-Packer**	5.750	3.875	7.10
EM0070247		**PN: 104490-000001 6 Pins @ 324 PSI Ea. = 1,944 PSI**			
		4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long	4.500	3.920	3.08
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.01
EM0070479		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.03
STAGE 1		**Packers Plus 4-1/2" Dual External Hydraulic Centralized FracPort**			4.34
6,809.90		**PN: 105810-000001 UPPER: 11 Pins @ 391 Ea. = 4,301 PSI / LOWER: 7 Pins @ 630 PSI = 4,410 PSI**	5.650	3.875	
156 BBLS		*4-1/2", 13.5#, L-80, LTC Pup Joint: 3' Long*	4.500	3.920	3.09
		4-1/2" 13.50# L-80 LTC LINER JOINTS: 2			82.03
		4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long	4.500	3.920	6.07
		Packers Plus 4-1/2" Toe Circulating Sub w/ *1.000" seat* for 1.250" SF-2 Setting balls	5.500	***1.000***	2.74
		PN: 103039-000011 3 Pins @ 396 PSI = 1,098 Shear		N/A	
G. Shoe @		**4-1/2" LTC Float Collar PN: 104733-000001**	5.000	N/A	1.37
6918		*4-1/2", 13.5#, L-80, LTC Pup Joint: 6' Long*	4.500	3.920	6.10
TD =		**4-1/2" LTC Float Collar PN: 104733-000001**	5.000	N/A	1.36
6933' MD		**7" X 4-1/2" LTC Guide Shoe (Upjet) PN: 121704-000001**	5.870	2.500	0.91
2563' TVD		**HA2001473**			

Service Center	Telephone	Contact	Sales Contact
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