

Results of Directional Survey

API number:	30-025-41496		
OGRID:		Operator:	MANZANO LLC
		Property:	LITTLE VALLEY FEDERAL # 1H

surface	ULSTR:	M	17	T 21S	R 32E
			660	FSL	1050 FWL

5383.95

BH Loc	ULSTR:	L	18	T 21S	R 32E
12339	MD	8300.8	TVD	2122 FSL	4128 FEL
					1256 FWL

Top Perf/OH	ULSTR:	I	18	T 21S	R 32E
9150	MD	8356.7	TVD	1729 FSL	982 FEL

Bot Perf/OH	ULSTR:	L	18	T 21S	R 32E
12245	MD	8301.6	TVD	2111 FSL	4034 FEL
					1350 FWL

	MD	N/S	E/W	VD
	9135	1066.70	-2031.60	8354.15
TOP PERFS/OH	9150	1069.23	-2031.60	8356.67
	9166	1071.93	-2031.60	8359.36
	12204	1446.55	-5043.66	8301.94
BOT PERFS/OH	12245	1451.14	-5084.46	8301.59
	12339	1461.66	-5178.00	8300.79

NEXT TO LAST	12204	1446.55	-5043.66	8301.94
LAST READING	12339	1461.66	-5178.00	8300.79
TD	12339	1461.66	-5178.00	8300.79

Surface Location	660	FS	1050	FW
Projected BHL	2122	FS	4128	FE
Location of				
Top Perfs/OH	1729	FS	982	FE
Bottom Perfs/OH	2111	FS	4034	FE

SUMMARY of Subsurface Locations

Surface Location	M-17-21S-32E	660	FS	1050	FW	Vert. Depth
Top Perfs/OH	I-18-21S-32E	1729	FS	982	FE	8356.67
Bottom Perfs/OH	L-18-21S-32E	2111	FS	4034	FE	8301.59
Projected TD	L-18-21S-32E	2122	FS	4128	FE	8300.79

SEP 05 2014

AUG 25 2014

RECEIVED

 Weatherford

Manzano LLC
Little Valley Federal #1
Lea Co., NM

Section 1

Weatherford (Wft) Final Definitive

Plot & Survey

Manzano, LLC

Little Valley Federal #1
Lea County, New Mexico

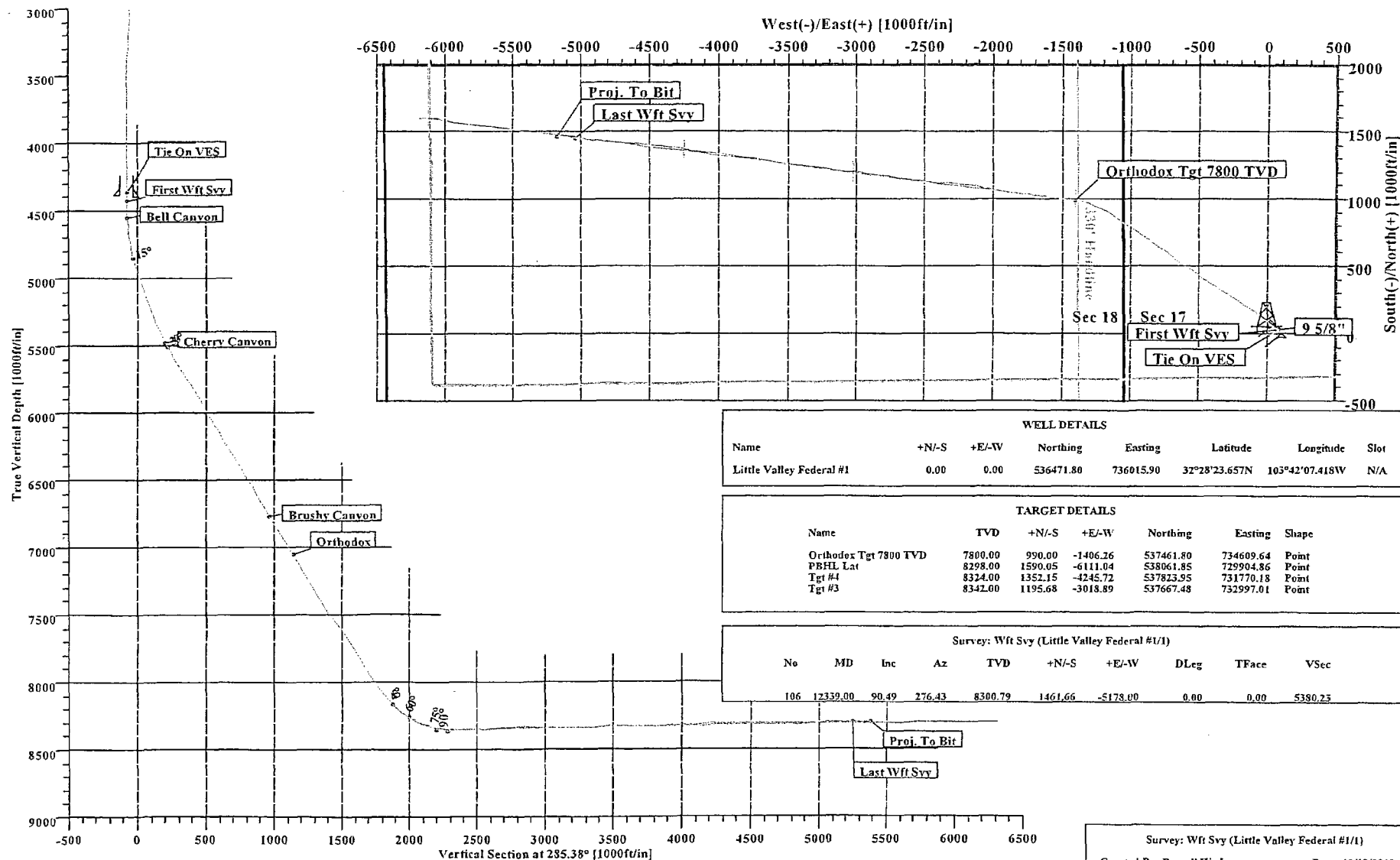
KB ELEV: 3651.5
GL ELEV: 3632

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	8725.00	42.82	276.39	8156.63	1018.16	-1650.32	0.00	0.00	1861.26	
2	9236.60	90.67	277.54	8352.81	1074.40	-2103.34	9.36	1.55	2312.96	
3	10160.22	90.67	277.55	8342.00	1195.68	-3018.89	0.00	83.31	3227.90	Tgt #3
4	10171.03	90.85	277.27	8341.86	1197.08	-3029.66	3.00	-59.80	3238.65	
5	11397.12	90.83	277.27	8324.00	1352.15	-4245.72	0.00	0.00	4452.29	Tgt #4
6	11398.53	90.79	277.27	8323.98	1352.33	-4247.12	3.00	178.45	4453.69	
7	13277.73	90.79	277.27	8298.00	1590.05	-6111.04	0.00	0.00	6313.90	PBHL Lat



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WELL DETAILS

Name	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
Little Valley Federal #1	0.00	0.00	536471.80	736015.90	32°28'23.657N	103°42'07.418W	N/A

TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
Orthodox Tgt 7800 TVD	7800.00	990.00	-1406.26	537461.80	734609.64	Point
PBHL Lat	8298.00	1590.05	-6111.04	538061.85	729904.86	Point
Tgt #4	8324.00	1352.15	-4245.72	537823.95	731770.18	Point
Tgt #3	8342.00	1195.68	-3018.89	537667.48	732997.01	Point

Survey: Wft Svy (Little Valley Federal #1/1)

No	MD	Inc	Az	TVD	+N/-S	+E/-W	DLeg	TFace	VSec
106	12339.00	90.49	276.43	8300.79	1461.66	-5178.00	0.00	0.00	5380.25

Proj. To Bit

Last Wft Svy

Survey: Wft Svy (Little Valley Federal #1/1)

Created By: Russell W. Joyner

Date: 12/12/2013

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Wft Survey Report X Y's.



Weatherford

Company: Manzano LLC Field: Lea Co., NM (NAD 83) Site: Little Valley Federal #1 Well: Little Valley Federal #1 Wellpath: 1		Date: 12/12/2013 Time: 15:44:01 Page: 1 Co-ordinate(NE) Reference: Well: Little Valley Federal #1 Vertical (TVD) Reference: SITE 3651.5 Section (VS) Reference: Well (0.00N,0.00E,285.38Azi) Survey Calculation Method: Minimum Curvature Db: Sybase								
Survey: Wft Svy Company: Weatherford Tool: MWD;MWD - Standard		Start Date: 12/2/2013 Engineer: Russell W. Joyner Tied-to: User Defined								
Site: Little Valley Federal #1 Site Position: Northing: 536471.80 ft Latitude: 32 28 23.657 N From: Map Easting: 736015.90 ft Longitude: 103 42 7.418 W Position Uncertainty: 0.00 ft North Reference: Grid Ground Level: 3632.00 ft Grid Convergence: 0.34 deg										
Well: Little Valley Federal #1 Slot Name: Well Position: +N/-S 0.00 ft Northing: 536471.80 ft Latitude: 32 28 23.657 N +E/-W 0.00 ft Easting: 736015.90 ft Longitude: 103 42 7.418 W Position Uncertainty: 0.00 ft										
Wellpath: 1 Drilled From: Surface Current Datum: SITE Tie-on Depth: 0.00 ft Magnetic Data: 4/15/2013 Above System Datum: Mean Sea Level Field Strength: 48594 nT Declination: 7.44 deg Vertical Section: Depth From (TVD) Mag Dip Angle: 60.35 deg ft +N/-S +E/-W Direction ft ft deg 0.00 0.00 0.00 285.38										
Survey										
MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	DLS deg/100ft	VS ft	MapN ft	MapE ft	Comment
4365.00	0.44	42.40	4362.59	28.07	84.27	0.00	-73.81	536499.87	736100.17	Tie On VES
4425.00	0.40	59.00	4422.59	28.35	84.61	0.21	-74.06	536500.15	736100.51	First Wft Svy
4520.00	1.87	294.45	4517.57	29.16	83.48	2.23	-72.76	536500.96	736099.38	
4552.00	2.94	290.17	4549.54	29.66	82.23	3.39	-71.42	536501.46	736098.13	
4616.00	5.04	294.03	4613.39	31.37	78.12	3.31	-67.01	536503.17	736094.02	
4679.00	7.16	302.78	4676.03	34.62	72.30	3.67	-60.52	536506.42	736088.20	
4742.00	8.59	304.95	4738.43	39.44	65.14	2.32	-52.34	536511.24	736081.04	
4806.00	12.08	305.21	4801.38	46.05	55.75	5.45	-41.54	536517.85	736071.65	
4870.00	15.74	307.84	4863.50	55.24	43.41	5.80	-27.21	536527.04	736059.31	
4933.00	16.78	306.46	4923.98	65.88	29.35	1.76	-10.83	536537.68	736045.25	
4997.00	18.86	307.10	4984.90	77.61	13.67	3.26	7.41	536549.41	736029.57	
5060.00	19.76	307.16	5044.36	90.19	-2.94	1.43	26.75	536561.99	736012.96	
5124.00	21.18	308.30	5104.31	103.89	-20.64	2.30	47.45	536575.69	735995.26	
5187.00	21.66	307.89	5162.96	118.08	-38.74	0.80	68.67	536589.88	735977.16	
5251.00	22.38	308.06	5222.29	132.85	-57.66	1.13	90.83	536604.65	735958.24	
5314.00	22.90	308.50	5280.44	147.87	-76.69	0.87	113.17	536619.67	735939.21	
5378.00	24.44	307.01	5339.05	163.60	-97.01	2.58	136.93	536635.40	735918.89	
5441.00	25.97	305.36	5396.05	179.42	-118.67	2.67	162.01	536651.22	735897.23	
5505.00	27.63	305.00	5453.18	196.05	-142.26	2.61	189.16	536667.85	735873.64	
5569.00	29.94	303.97	5509.27	213.49	-167.66	3.69	218.28	536685.29	735848.24	
5632.00	31.48	303.83	5563.43	231.43	-194.37	2.45	248.79	536703.23	735821.53	
5664.00	31.83	304.01	5590.67	240.80	-208.30	1.13	264.71	536712.60	735807.60	
5728.00	32.09	303.82	5644.97	259.70	-236.42	0.44	296.83	536731.50	735779.48	
5823.00	32.64	302.78	5725.21	287.62	-278.92	0.82	345.21	536759.42	735736.98	
5918.00	32.41	301.44	5805.31	314.77	-322.18	0.80	394.13	536786.57	735693.72	
6014.00	32.61	301.18	5886.27	341.58	-366.26	0.25	443.74	536813.38	735649.64	
6109.00	32.48	303.11	5966.35	368.77	-409.53	1.10	492.67	536840.57	735606.37	
6235.00	31.28	305.88	6073.35	406.42	-464.38	1.50	555.54	536878.22	735551.52	
6331.00	32.05	305.98	6155.06	436.00	-505.18	0.80	602.73	536907.80	735510.72	
6426.00	32.79	305.17	6235.25	465.62	-546.61	0.90	650.53	536937.42	735469.29	

Weatherford

Wft Survey Report X Y's.



Weatherford

Company: Manzano LLC
 Field: Lea Co., NM (NAD 83)
 Site: Little Valley Federal #1
 Well: Little Valley Federal #1
 Wellpath: 1

Date: 12/12/2013 Time: 15:44:01 Page: 2
 Co-ordinate(N/E) Reference: Well: Little Valley Federal #1
 Vertical (TVD) Reference: SITE 3651.5
 Section (VS) Reference: Well (0.00N,0.00E,285.38Azi)
 Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	DLS deg/100ft	VS ft	MapN ft	MapE ft	Comment
6521.00	33.86	304.57	6314.63	495.46	-589.43	1.18	699.73	536967.26	735426.47	
6616.00	32.76	304.54	6394.02	525.05	-632.40	1.16	749.00	536996.85	735383.50	
6711.00	30.63	305.79	6474.85	553.78	-673.21	2.35	795.97	537025.58	735342.69	
6806.00	31.81	305.25	6556.09	582.38	-713.29	1.28	842.20	537054.18	735302.61	
6901.00	32.50	304.28	6636.52	611.21	-754.82	0.91	889.90	537083.01	735261.08	
6996.00	31.76	305.57	6716.97	640.13	-796.25	1.06	937.51	537111.93	735219.65	
7090.00	31.92	305.12	6796.82	668.81	-836.70	0.30	984.12	537140.61	735179.20	
7183.00	32.27	304.98	6875.61	697.19	-877.15	0.38	1030.65	537168.99	735138.75	
7277.00	33.10	306.04	6954.72	726.68	-918.47	1.07	1078.30	537198.48	735097.43	
7370.00	33.87	305.45	7032.29	756.65	-960.11	0.90	1126.41	537228.45	735055.79	
7463.00	32.76	306.19	7110.01	786.54	-1001.53	1.27	1174.27	537258.34	735014.37	
7557.00	32.31	306.05	7189.25	816.34	-1042.37	0.49	1221.55	537288.14	734973.53	
7651.00	31.87	305.45	7268.89	845.52	-1082.89	0.58	1268.36	537317.32	734933.01	
7745.00	32.87	304.69	7348.28	874.43	-1124.09	1.15	1315.75	537346.23	734891.81	
7841.00	35.20	300.27	7427.85	903.21	-1169.42	3.54	1367.09	537375.01	734846.48	
7936.00	35.39	295.80	7505.40	928.99	-1217.84	2.73	1420.61	537400.79	734798.06	
8030.00	34.79	292.51	7582.32	951.11	-1267.12	2.11	1474.00	537422.91	734748.78	
8125.00	33.47	287.79	7660.97	969.49	-1317.12	3.11	1527.07	537441.29	734698.78	
8220.00	33.01	282.83	7740.44	983.24	-1367.30	2.90	1579.11	537455.04	734648.60	
8314.00	33.44	276.39	7819.10	991.81	-1418.02	3.78	1630.29	537463.61	734597.88	
8408.00	32.85	275.44	7897.80	997.11	-1469.14	0.84	1680.98	537468.91	734546.76	
8503.00	33.25	276.25	7977.43	1002.39	-1520.68	0.63	1732.08	537474.19	734495.22	
8599.00	34.25	276.95	8057.25	1008.53	-1573.66	1.12	1784.78	537480.33	734442.24	
8630.00	35.52	277.56	8082.68	1010.77	-1591.25	4.25	1802.34	537482.57	734424.65	
8661.00	37.47	277.38	8107.60	1013.16	-1609.53	6.30	1820.60	537484.96	734406.37	
8693.00	39.81	277.12	8132.59	1015.68	-1629.35	7.33	1840.38	537487.48	734386.55	
8725.00	42.82	276.39	8156.63	1018.16	-1650.32	9.53	1861.26	537489.96	734365.58	
8756.00	47.74	275.93	8178.43	1020.52	-1672.22	15.91	1883.00	537492.32	734343.68	
8787.00	52.06	274.84	8198.40	1022.74	-1695.82	14.19	1906.34	537494.54	734320.08	
8819.00	55.92	275.19	8217.21	1025.00	-1721.60	12.09	1931.80	537496.80	734294.30	
8851.00	57.01	276.38	8234.88	1027.70	-1748.14	4.61	1958.10	537499.50	734267.76	
8882.00	59.11	277.21	8251.28	1030.81	-1774.26	7.14	1984.11	537502.61	734241.64	
8914.00	60.76	278.42	8267.32	1034.58	-1801.69	6.11	2011.56	537506.38	734214.21	
8946.00	61.88	278.87	8282.67	1038.80	-1829.45	3.71	2039.44	537510.60	734186.45	
8977.00	63.09	277.72	8296.99	1042.76	-1856.65	5.10	2066.72	537514.56	734159.25	
9009.00	64.74	278.29	8311.06	1046.77	-1885.11	5.40	2095.23	537518.57	734130.79	
9040.00	66.27	279.33	8323.92	1051.09	-1912.99	5.80	2123.25	537522.89	734102.91	
9071.00	69.05	280.25	8335.70	1055.97	-1941.24	9.38	2151.78	537527.77	734074.66	
9103.00	73.24	280.21	8346.04	1061.34	-1971.03	13.09	2181.94	537533.14	734044.87	
9135.00	77.39	279.73	8354.15	1066.70	-2001.52	13.05	2212.75	537538.50	734014.38	
9166.00	83.26	280.10	8359.36	1071.96	-2031.60	18.97	2243.15	537543.76	733984.30	
9197.00	89.51	280.65	8361.31	1077.53	-2062.02	20.24	2273.96	537549.33	733953.88	
9228.00	92.52	280.85	8360.76	1083.31	-2092.47	9.73	2304.85	537555.11	733923.43	
9259.00	93.71	279.96	8359.08	1088.90	-2122.91	4.79	2335.69	537560.70	733892.99	
9354.00	93.22	275.12	8353.33	1101.34	-2216.89	5.11	2429.60	537573.14	733799.01	
9449.00	90.35	275.02	8350.37	1109.73	-2311.46	3.02	2523.01	537581.53	733704.44	
9544.00	91.19	275.17	8349.10	1118.16	-2406.08	0.90	2616.47	537589.96	733609.82	
9637.00	94.21	274.52	8344.72	1126.01	-2498.63	3.32	2707.79	537597.81	733517.27	
9730.00	93.78	275.44	8338.24	1134.06	-2591.06	1.09	2799.04	537605.86	733424.84	
9823.00	87.13	277.14	8337.50	1144.25	-2683.44	7.38	2890.81	537616.05	733332.46	
9916.00	87.20	276.74	8342.10	1155.47	-2775.64	0.44	2982.69	537627.27	733240.26	
10009.00	90.42	277.63	8344.03	1167.10	-2867.88	3.59	3074.71	537638.90	733148.02	

Weatherford

Wft Survey Report X Y's.



Weatherford

Company: Manzano LLC
 Field: Lea Co., NM (NAD 83)
 Site: Little Valley Federal #1
 Well: Little Valley Federal #1
 Wellpath: 1

Date: 12/12/2013 Time: 15:44:01 Page: 3
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 Vertical (TVD) Reference: SITE 3651.5
 Section (VS) Reference: Well (0.00N,0.00E,285.38Azi)
 Survey Calculation Method: Minimum Curvature Db: Sybase

Survey

MD ft	Incl deg	Azim deg	TVD ft	N/S ft	E/W ft	DLS deg/100ft	VS ft	MapN ft	MapE ft	Comment
10104.00	90.07	277.35	8343.62	1179.48	-2962.07	0.47	3168.81	537651.28	733053.83	
10200.00	92.31	277.32	8341.63	1191.73	-3057.26	2.33	3263.84	537663.53	732958.64	
10296.00	90.91	277.67	8338.93	1204.25	-3152.40	1.50	3358.89	537676.05	732863.50	
10392.00	91.19	277.50	8337.17	1216.92	-3247.54	0.34	3453.99	537688.72	732768.36	
10488.00	91.40	277.70	8335.00	1229.61	-3342.67	0.30	3549.08	537701.41	732673.23	
10584.00	90.56	278.53	8333.36	1243.16	-3437.69	1.23	3644.30	537714.96	732578.21	
10680.00	91.47	279.16	8331.66	1257.92	-3532.54	1.15	3739.66	537729.72	732483.36	
10776.00	90.91	279.49	8329.67	1273.47	-3627.25	0.68	3835.10	537745.27	732388.65	
10871.00	92.87	278.97	8326.53	1288.70	-3720.96	2.13	3929.50	537760.50	732294.94	
10968.00	91.12	278.20	8323.16	1303.17	-3816.81	1.97	4025.75	537774.97	732199.09	
11064.00	92.31	279.80	8320.28	1318.18	-3911.58	2.08	4121.11	537789.98	732104.32	
11160.00	91.19	278.49	8317.35	1333.43	-4006.31	1.79	4216.49	537805.23	732009.59	
11256.00	90.14	277.47	8316.24	1346.76	-4101.38	1.52	4311.68	537818.56	731914.52	
11351.00	90.63	277.17	8315.60	1358.86	-4195.60	0.60	4405.74	537830.66	731820.30	
11446.00	90.00	277.06	8315.08	1370.63	-4289.87	0.67	4499.76	537842.43	731726.03	
11541.00	90.35	276.35	8314.79	1381.72	-4384.21	0.83	4593.67	537853.52	731631.69	
11636.00	92.10	275.94	8312.76	1391.89	-4478.64	1.89	4687.41	537863.69	731537.26	
11731.00	91.19	275.51	8310.03	1401.36	-4573.13	1.06	4781.03	537873.16	731442.77	
11825.00	90.56	275.39	8308.59	1410.29	-4666.69	0.68	4873.61	537882.09	731349.21	
11920.00	89.72	275.06	8308.36	1418.94	-4761.30	0.95	4967.12	537890.74	731254.60	
12015.00	91.68	275.55	8307.20	1427.72	-4855.88	2.13	5060.64	537899.52	731160.02	
12110.00	92.10	275.45	8304.07	1436.82	-4950.39	0.45	5154.18	537908.62	731065.51	
12204.00	90.49	276.43	8301.94	1446.55	-5043.86	2.00	5246.88	537918.35	730972.04	Last Wft Svy
12339.00	90.49	276.43	8300.79	1461.66	-5178.00	0.00	5380.23	537933.46	730837.90	Proj. To Bit

Annotation

MD ft	TVD ft	
4365.00	4362.59	Tie On VES
4425.00	4422.59	First Wft Svy
12204.00	8301.94	Last Wft Svy
12339.00	8300.79	Proj. To Bit