

Received
 Office of Oil & Gas
 NOV 20 2015

Plan Data for 1H

Plan Point Information:

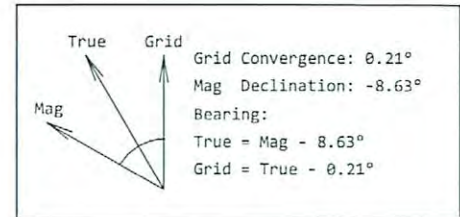
DogLeg	Severity	Unit	Position offsets from Slot centre							
MD	Inc	Az	TVD	+N/-S	+E/-W	VSec	DLS	Build	Turn	
(USft)	(°)	(°)	(USft)	(USft)	(USft)	(USft)	(DLSU)	(DLSU)	(DLSU)	
2862.00	0.74	351.29	2861.78	26.72	-0.36	12.70	0.12	0.05	-8.76	
3100.00	0.74	351.29	3099.76	29.76	-0.83	14.52	0.00	0.00	0.00	
3542.24	16.96	182.09	3535.84	-32.38	-3.63	-11.78	4.00	3.67	-38.26	
6741.36	16.96	182.09	6595.78	-965.06	-37.60	-413.78	0.00	0.00	0.00	
7994.63	90.00	309.72	7415.99	-667.06	-706.26	316.84	8.00	5.83	10.18	
12369.00	90.00	309.72	7415.99	2128.48	-4070.79	4593.67	0.00	0.00	0.00	

Plan Data for 1H

Target Set Information:
 Name: RIDGETOP 1H TARGETS

Position offsets from Slot centre

Name	TVD	+N/-S	+E/-W	Northing	Easting	Lat	Long
	(USft)	(USft)	(USft)	(USft)	(USft)	(°/'/'")	(°/'/'")
1H LP	7416.00	-667.06	-706.26	14404561.02	1731618.03	39°39'50.5"	-80°40'33.3"
1H PBHL	7416.00	2128.47	-4070.79	14407356.55	1728253.50	39°40'18.3"	-80°41'16.2"



Plan Data for 1H

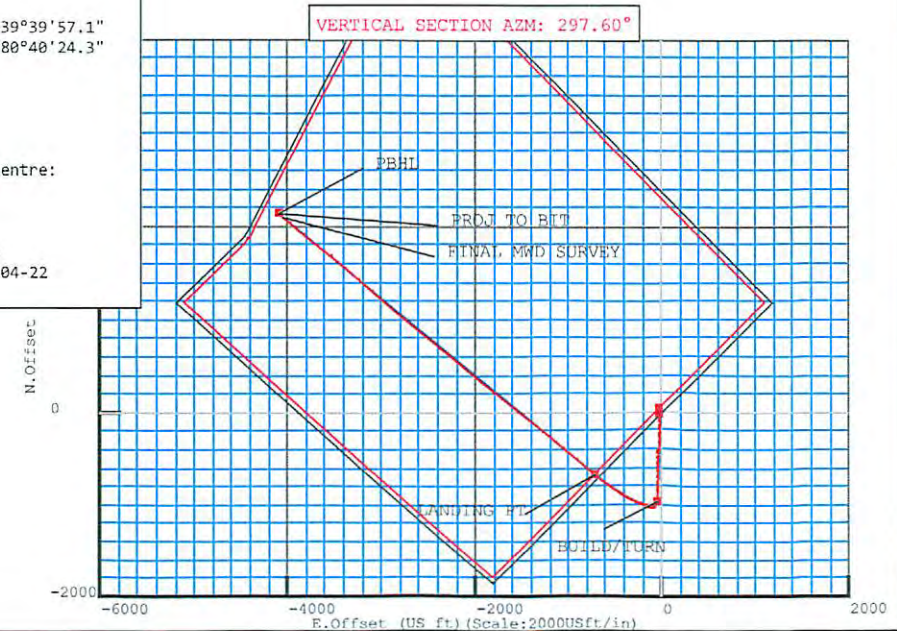
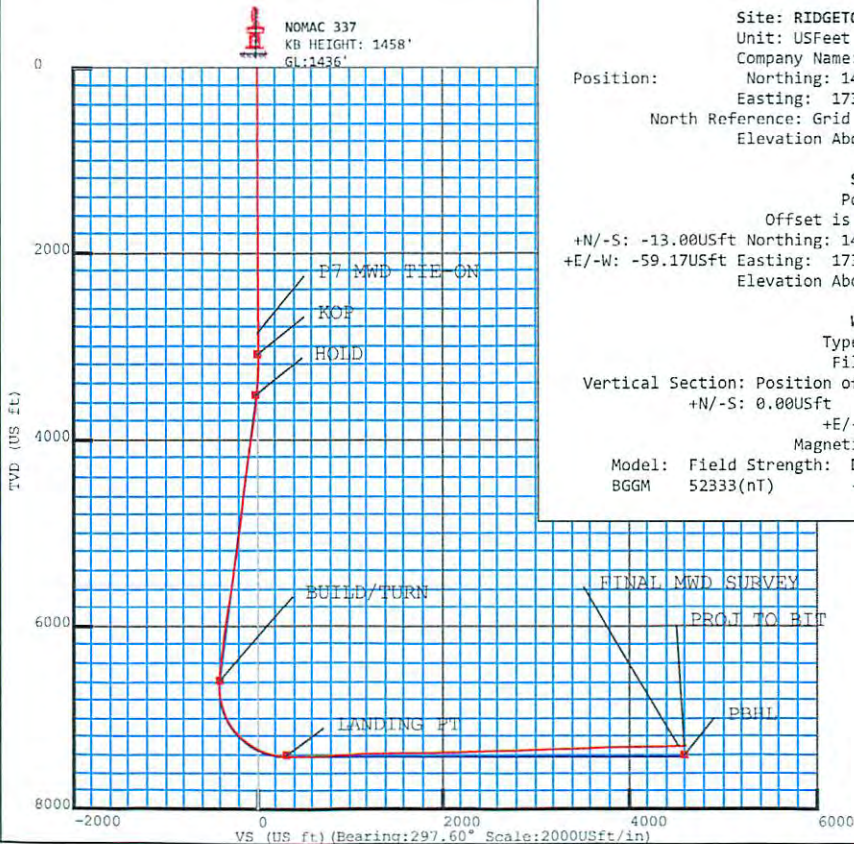
Field: SOUTHWESTERN_WETZEL CO, WV UTM NAD 83 (17N)
 Map Unit: USFt Vertical Reference Datum (VRD): Mean Sea Level
 Projected Coordinate System: NAD83 / UTM zone 17N

Site: RIDGETOP LAND VENTURES WTZ
 Unit: USFeet TVD Reference:
 Company Name: SOUTHWESTERN ENERGY

Position:
 Northing: 14405241.08USft Latitude: 39°39'57.2"
 Easting: 1732383.46USft Longitude: -80°40'23.5"
 North Reference: Grid Grid Convergence: 0.21°
 Elevation Above VRD: 1436.00USft

Slot: 1H
 Position:
 Offset is from Site centre
 +N/-S: -13.00USft Northing: 14405228.08USft Latitude: 39°39'57.1"
 +E/-W: -59.17USft Easting: 1732324.29USft Longitude: -80°40'24.3"
 Elevation Above VRD: 1436.00USft

Well: 1H
 Type: Main-Well
 File Number:
 Vertical Section: Position offset of origin from Slot centre:
 +N/-S: 0.00USft Azimuth: 297.60°
 +E/-W: 0.00USft
 Magnetic Parameters:
 Model: Field Strength: Declination: Dip: Date:
 BGGM 52333(NT) -8.63° 67.07° 2015-04-22



5D Survey Report

SOUTHWESTERN ENERGY

Field Name: *SOUTHWESTERN_WETZEL CO, WV UTM NAD 83 (17N)*
Site Name: *RIDGETOP LAND VENTURES WTZ*
Well Name: *1H*
Survey: *Definitive Survey*

05 May 2015

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Survey report for 1H

Field Name	Map Units : US ft Company Name : SOUTHWESTERN ENERGY	
SOUTHWESTERN_WETZ EL CO, WV UTM NAD 83 (17N)	Vertical Reference Datum (VRD) : Mean Sea Level	
	Projected Coordinate System : NAD83 / UTM zone 17N	
	Comment :	
Site Name	Units : US ft	North Reference : Grid
RIDGETOP LAND VENTURES WTZ	Position	Convergence Angle : 0.21
		Northing : 14405241.08 US ft
		Latitude : 39.665889
	Easting : 1732383.46 US ft	Longitude : -80.673194
	Elevation above Mean Sea Level: 1436.00 US ft	
	Comment :	
Slot Name	Position (Offsets relative to Site Centre)	
1H	+N / -S : -13.00 US ft	Northing : 14405228.08 US ft
	+E / -W : -59.17 US ft	Easting : 1732324.29 US ft
		Latitude : 39.665854
		Longitude : -80.673405
	Slot TVD Reference : Ground Elevation	
	Elevation above Mean Sea Level : 1436.00 US ft	
	Comment :	
Well Name	Type : Main well	UWI :
1H	Rig Height <i>Drill Floor</i> : 22.00 US ft	Comment :
	Relative to Mean Sea Level: 1458.00 US ft	
	Closure Distance : 4597.32 US ft	Closure Azimuth : 297.543°
	Vertical Section (Position of Origin Relative to Slot)	
	+N / -S : 0.00 US ft	Az : 297.60°
	+E / -W : 0.00 US ft	

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5D Survey Report

Target Set

Name : RIDGETOP 1H TARGETS **Number of Targets :** 2

Comment :

TargetName:	Position (Relative to Slot centre)		
1H LP	+N / -S : -667.06US ft	Northing : 14404561.02 US ft	Latitude : 39°39'50.503880"
Shape:	+E / -W : -706.26 US ft	Easting : 1731618.03US ft	Longitude : -80°40'33.323189"
Cuboid	TVD (Drill Floor) : 7416.00 US ft		
Orientation	Azimuth : 0.00°	Inclination : 0.00°	
Dimensions	Length : 20.00 US ft	Breadth : 20.00 US ft	Height : 20.00 US ft
TargetName:	Position (Relative to Slot centre)		
1H PBHL	+N / -S : 2128.47US ft	Northing : 14407356.55 US ft	Latitude : 39°40'18.260400"
Shape:	+E / -W : -4070.79 US ft	Easting : 1728253.50US ft	Longitude : -80°41'16.238400"
Cuboid	TVD (Drill Floor) : 7416.00 US ft		
Orientation	Azimuth : 0.00°	Inclination : 0.00°	
Dimensions	Length : 20.00 US ft	Breadth : 20.00 US ft	Height : 20.00 US ft

Survey Name :Definitive Survey

Date : 16/Mar/2015 **Survey Tool :** **Comment :** **Company :**

Magnetic Model

Model Name: Default **Date:** 19/Feb/2015 **Field Strength:** 50000.0 nT **Declination:** 0.00° **Dip:** 0.00°

Survey Tool Ranges

Name	Start MD (us ft)	End MD (us ft)	Source Survey
EMS	0.00	776.00	MSS
MWD	776.00	12370.00	WFT MWD

Well path created using minimum curvature

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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
0.00	0.00	0.00	0.00	0.00	0.00	0.00	14405228 .08	1732324. 29	0.00	0.00	0.00	0.00	0.00	0.00	
152.82	0.60	268.16	152.82	-0.03	-0.80	0.70	14405228 .05	1732323. 49	0.39	0.39	268.16	152.82	-0.00	0.00	
275.70	0.50	268.16	275.69	-0.06	-1.98	1.72	14405228 .02	1732322. 31	0.08	-0.08	180.00	122.88	-0.00	0.00	
398.00	0.60	264.46	397.99	-0.14	-3.15	2.72	14405227 .94	1732321. 14	0.09	0.08	338.59	122.30	-0.00	0.00	
493.00	0.60	11.76	492.98	0.30	-3.54	3.28	14405228 .38	1732320. 75	1.02	0.00	143.65	95.00	-0.00	0.00	
586.00	0.60	111.26	585.98	0.60	-2.99	2.93	14405228 .68	1732321. 30	0.98	0.00	139.75	93.00	-0.00	0.00	
681.00	0.70	125.76	680.97	0.08	-2.06	1.86	14405228 .16	1732322. 24	0.20	0.11	66.09	95.00	-0.00	0.00	
776.00	0.80	27.56	775.97	0.33	-1.28	1.28	14405228 .41	1732323. 01	1.20	0.11	224.21	95.00	-0.00	0.00	
818.00	0.17	341.78	817.97	0.65	-1.16	1.33	14405228 .72	1732323. 13	1.65	-1.50	190.14	42.00	-0.00	0.00	
881.00	0.39	352.06	880.97	0.95	-1.22	1.52	14405229 .03	1732323. 07	0.36	0.35	18.04	63.00	-0.00	0.00	
976.00	0.43	355.13	975.96	1.62	-1.30	1.90	14405229 .70	1732323. 00	0.05	0.04	30.32	95.00	-0.00	0.00	
1071.00	0.51	6.74	1070.96	2.40	-1.28	2.24	14405230 .48	1732323. 02	0.13	0.08	55.87	95.00	-0.00	0.00	
1166.00	0.46	27.28	1165.96	3.16	-1.05	2.39	14405231 .23	1732323. 24	0.19	-0.05	116.15	95.00	-0.00	0.00	
1261.00	0.64	341.87	1260.95	4.00	-1.04	2.78	14405232 .08	1732323. 25	0.48	0.19	268.66	95.00	-0.00	0.00	
1356.00	0.55	359.97	1355.95	4.96	-1.21	3.37	14405233 .04	1732323. 08	0.22	-0.09	124.45	95.00	-0.00	0.00	
1451.00	0.64	0.08	1450.94	5.95	-1.21	3.82	14405234 .02	1732323. 08	0.09	0.09	0.78	95.00	-0.00	0.00	
1546.00	0.80	4.50	1545.94	7.14	-1.15	4.33	14405235 .22	1732323. 14	0.18	0.17	21.36	95.00	-0.00	0.00	
1640.00	1.00	2.95	1639.92	8.61	-1.06	4.93	14405236 .69	1732323. 23	0.21	0.21	352.28	94.00	-0.00	0.00	
1735.00	0.96	5.56	1734.91	10.23	-0.91	5.57	14405238 .31	1732323. 35	0.06	-0.04	133.16	95.00	-0.00	0.00	

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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
1829.00	1.03	6.96	1828.90	11.85	-0.76	6.17	14405239 .93	1732323. 53	0.08	0.07	19.85	94.00	-0.00	0.00	
1924.00	0.98	9.77	1923.88	13.50	-0.52	6.72	14405241 .58	1732323. 77	0.07	-0.05	136.81	95.00	-0.00	0.00	
2018.00	0.91	18.73	2017.87	15.00	-0.14	7.08	14405243 .08	1732324. 15	0.17	-0.07	119.78	94.00	-0.00	0.00	
2113.00	0.88	13.85	2112.86	16.42	0.27	7.37	14405244 .50	1732324. 56	0.09	-0.03	246.09	95.00	-0.00	0.00	
2207.00	0.98	4.36	2206.84	17.93	0.51	7.86	14405246 .00	1732324. 80	0.20	0.11	298.19	94.00	-0.00	0.00	
2302.00	0.84	5.36	2301.83	19.43	0.63	8.44	14405247 .51	1732324. 92	0.15	-0.15	174.03	95.00	-0.00	0.00	
2397.00	0.80	349.52	2396.82	20.77	0.58	9.11	14405248 .85	1732324. 87	0.24	-0.04	252.14	95.00	-0.00	0.00	
2492.00	0.78	345.91	2491.81	22.05	0.30	9.95	14405250 .13	1732324. 59	0.06	-0.02	246.31	95.00	-0.00	0.00	
2587.00	0.80	353.05	2586.80	23.34	0.06	10.76	14405251 .42	1732324. 35	0.11	0.02	82.10	95.00	-0.00	0.00	
2683.00	0.67	347.85	2682.80	24.55	-0.14	11.50	14405252 .63	1732324. 15	0.15	-0.14	204.58	96.00	-0.00	0.00	
2779.00	0.70	358.56	2778.79	25.69	-0.27	12.14	14405253 .77	1732324. 02	0.14	0.03	82.21	96.00	-0.00	0.00	
2862.00	0.74	351.29	2861.78	26.72	-0.36	12.70	14405254 .80	1732323. 93	0.12	0.05	289.98	83.00	-0.00	0.00	
3094.00	0.14	288.80	3093.78	28.30	-0.86	13.87	14405256 .38	1732323. 43	0.30	-0.26	190.42	232.00	-0.00	0.00	
3189.00	3.14	186.11	3188.73	25.75	-1.25	13.03	14405253 .83	1732323. 05	3.34	3.16	254.85	95.00	-0.00	0.00	
3283.00	6.51	182.53	3282.38	17.86	-1.76	9.83	14405245 .94	1732322. 54	3.60	3.59	353.11	94.00	-0.00	0.00	
3378.00	9.66	180.98	3376.43	4.51	-2.13	3.98	14405232 .59	1732322. 16	3.32	3.32	355.27	95.00	-0.00	0.00	
3472.00	12.09	186.80	3468.73	-13.16	-3.43	-3.05	14405214 .92	1732320. 86	2.83	2.59	27.20	94.00	-0.00	0.00	
3567.00	15.09	190.89	3561.07	-35.18	-6.95	-10.15	14405192 .90	1732317. 35	3.31	3.16	19.76	95.00	-0.00	0.00	
3662.00	16.96	184.75	3652.38	-61.14	-10.43	-19.08	14405166 .94	1732313. 86	2.65	1.97	314.83	95.00	-0.00	0.00	

5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
3757.00	17.88	180.29	3743.02	-89.53	-11.65	-31.15	14405138 .55	1732312. 64	1.71	0.97	302.43	95.00	-0.00	0.00	
3852.00	17.61	179.98	3833.50	-118.49	-11.72	-44.51	14405109 .59	1732312. 57	0.30	-0.28	199.14	95.00	-0.00	0.00	
3946.00	16.80	180.26	3923.30	-146.29	-11.78	-57.34	14405081 .79	1732312. 51	0.87	-0.86	174.30	94.00	-0.00	0.00	
4041.00	17.43	178.76	4014.09	-174.24	-11.53	-70.51	14405053 .83	1732312. 76	0.81	0.66	324.26	95.00	-0.00	0.00	
4136.00	17.33	177.67	4104.75	-202.61	-10.65	-84.43	14405025 .47	1732313. 64	0.36	-0.11	252.41	95.00	-0.00	0.00	
4231.00	18.36	179.55	4195.18	-231.71	-9.95	-98.53	14404996 .37	1732314. 34	1.24	1.08	30.12	95.00	-0.00	0.00	
4325.00	18.00	179.98	4284.49	-261.03	-9.83	-112.22	14404967 .04	1732314. 46	0.41	-0.38	159.77	94.00	-0.00	0.00	
4327.00	18.00	179.98	4286.39	-261.65	-9.83	-112.51	14404966 .43	1732314. 46	0.00	0.00	0.00	2.00	-0.00	0.00	
4420.00	17.29	181.17	4375.02	-289.84	-10.11	-125.32	14404938 .24	1732314. 18	0.86	-0.76	153.63	93.00	-0.00	0.00	
4515.00	15.95	182.45	4466.04	-317.00	-10.96	-137.15	14404911 .08	1732313. 33	1.46	-1.41	165.33	95.00	-0.00	0.00	
4610.00	16.77	187.46	4557.20	-343.63	-13.29	-147.42	14404884 .45	1732311. 00	1.72	0.86	62.26	95.00	-0.00	0.00	
4704.00	16.73	184.96	4647.22	-370.55	-16.22	-157.30	14404857 .53	1732308. 07	0.77	-0.04	265.63	94.00	-0.00	0.00	
4799.00	15.29	187.85	4738.53	-396.59	-19.12	-166.79	14404831 .49	1732305. 17	1.73	-1.52	152.42	95.00	-0.00	0.00	
4894.00	16.59	186.19	4829.88	-422.48	-22.29	-175.98	14404805 .60	1732302. 00	1.45	1.37	339.88	95.00	-0.00	0.00	
4988.00	18.67	185.29	4919.46	-450.81	-25.13	-186.59	14404777 .27	1732299. 17	2.23	2.21	352.10	94.00	-0.00	0.00	
5083.00	19.90	183.63	5009.12	-482.08	-27.55	-198.93	14404746 .00	1732296. 74	1.42	1.29	335.19	95.00	-0.00	0.00	
5178.00	18.50	186.92	5098.84	-513.18	-30.39	-210.82	14404714 .90	1732293. 90	1.86	-1.47	143.85	95.00	-0.00	0.00	
5273.00	18.36	182.71	5188.97	-543.09	-32.91	-222.44	14404684 .99	1732291. 38	1.41	-0.15	262.00	95.00	-0.00	0.00	
5368.00	18.69	176.07	5279.06	-573.23	-32.58	-236.70	14404654 .85	1732291. 71	2.25	0.35	275.73	95.00	-0.00	0.00	

5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
5463.00	18.42	179.93	5369.12	-603.42	-31.52	-251.63	14404624 .66	1732292. 77	1.32	-0.28	104.22	95.00	-0.00	0.00	
5558.00	16.95	186.01	5459.64	-632.21	-32.95	-263.70	14404595 .87	1732291. 34	2.48	-1.55	131.39	95.00	-0.00	0.00	
5653.00	17.97	181.77	5550.27	-660.63	-34.85	-275.18	14404567 .45	1732289. 44	1.72	1.07	306.69	95.00	-0.00	0.00	
5747.00	18.76	175.81	5639.49	-690.20	-34.20	-289.46	14404537 .88	1732290. 10	2.17	0.84	289.97	94.00	-0.00	0.00	
5842.00	19.32	176.72	5729.29	-721.13	-32.18	-305.58	14404506 .95	1732292. 11	0.67	0.59	28.36	95.00	-0.00	0.00	
5937.00	19.00	178.60	5819.03	-752.27	-30.90	-321.14	14404475 .80	1732293. 39	0.73	-0.34	118.30	95.00	-0.00	0.00	
6032.00	18.59	180.15	5908.96	-782.88	-30.56	-335.62	14404445 .20	1732293. 73	0.68	-0.43	130.12	95.00	-0.00	0.00	
6127.00	18.74	179.25	5998.96	-813.28	-30.40	-349.84	14404414 .80	1732293. 89	0.34	0.16	297.08	95.00	-0.00	0.00	
6223.00	16.81	182.14	6090.38	-842.57	-30.72	-363.14	14404385 .50	1732293. 57	2.21	-2.01	156.80	96.00	-0.00	0.00	
6317.00	16.42	184.54	6180.46	-869.40	-32.28	-374.18	14404358 .68	1732292. 01	0.84	-0.41	120.76	94.00	-0.00	0.00	
6412.00	16.60	185.00	6271.54	-896.31	-34.53	-384.66	14404331 .77	1732289. 77	0.23	0.19	36.21	95.00	-0.00	0.00	
6506.00	17.75	182.89	6361.35	-923.99	-36.42	-395.81	14404304 .09	1732287. 87	1.39	1.22	330.54	94.00	-0.00	0.00	
6601.00	17.71	186.39	6451.84	-952.82	-38.76	-407.09	14404275 .26	1732285. 53	1.12	-0.04	93.82	95.00	-0.00	0.00	
6630.00	18.17	188.98	6479.43	-961.67	-39.95	-410.13	14404266 .41	1732284. 34	3.18	1.59	61.27	29.00	-0.00	0.00	
6678.00	18.70	191.89	6524.96	-976.59	-42.71	-414.60	14404251 .49	1732281. 58	2.21	1.10	61.45	48.00	-0.26	-0.38	
6712.00	18.43	191.68	6557.20	-987.19	-44.92	-417.55	14404240 .89	1732279. 37	0.82	-0.79	193.81	34.00	-0.56	-0.89	
6744.00	17.12	193.49	6587.67	-996.72	-47.04	-420.09	14404231 .36	1732277. 25	4.44	-4.09	157.99	32.00	-0.49	-1.49	
6776.00	15.09	199.85	6618.41	-1005.22	-49.55	-421.80	14404222 .86	1732274. 74	8.40	-6.34	142.03	32.00	-0.27	-2.11	
6807.00	14.14	211.94	6648.42	-1012.23	-52.93	-422.06	14404215 .85	1732271. 36	10.29	-3.06	113.09	31.00	-0.55	-2.95	

5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
6839.00	13.72	224.43	6679.48	-1018.26	-57.65	-420.66	14404209 .82	1732266. 64	9.47	-1.31	103.98	32.00	-1.59	-4.10	
6871.00	14.13	234.87	6710.55	-1023.22	-63.51	-417.77	14404204 .86	1732260. 78	7.94	1.28	85.82	32.00	-3.39	-5.08	
6902.00	14.84	243.53	6740.56	-1027.16	-70.16	-413.71	14404200 .92	1732254. 14	7.35	2.29	76.08	31.00	-5.77	-5.45	
6934.00	15.74	251.51	6771.43	-1030.37	-77.94	-408.29	14404197 .71	1732246. 35	7.15	2.81	70.73	32.00	-8.36	-5.17	
6966.00	16.65	259.82	6802.17	-1032.55	-86.57	-401.66	14404195 .52	1732237. 72	7.77	2.84	72.59	32.00	-10.74	-4.28	
6997.00	17.17	268.60	6831.83	-1033.45	-95.52	-394.15	14404194 .63	1732228. 77	8.40	1.68	82.71	31.00	-12.54	-3.04	
7029.00	17.11	279.16	6862.42	-1032.82	-104.89	-385.55	14404195 .26	1732219. 40	9.71	-0.19	96.15	32.00	-13.44	-1.74	
7061.00	17.40	288.08	6892.98	-1030.58	-114.09	-376.36	14404197 .50	1732210. 20	8.31	0.91	88.02	32.00	-13.24	-1.61	
7092.00	19.39	290.97	6922.40	-1027.30	-123.30	-366.68	14404200 .78	1732200. 99	7.06	6.42	26.00	31.00	-12.53	-3.26	
7124.00	22.13	291.75	6952.32	-1023.17	-133.86	-355.40	14404204 .91	1732190. 43	8.61	8.56	6.13	32.00	-11.80	-5.27	
7156.00	24.38	290.26	6981.72	-1018.65	-145.66	-342.85	14404209 .43	1732178. 64	7.27	7.03	344.66	32.00	-10.92	-7.09	
7187.00	26.63	290.42	7009.70	-1014.01	-158.17	-329.61	14404214 .07	1732166. 12	7.26	7.26	1.83	31.00	-10.17	-7.90	
7219.00	29.27	290.34	7037.96	-1008.78	-172.23	-314.73	14404219 .30	1732152. 06	8.25	8.25	359.15	32.00	-9.43	-8.25	
7250.00	32.08	291.11	7064.62	-1003.18	-187.02	-299.03	14404224 .90	1732137. 27	9.15	9.06	8.29	31.00	-9.03	-8.05	
7282.00	34.75	290.61	7091.33	-996.91	-203.48	-281.54	14404231 .17	1732120. 81	8.39	8.34	353.90	32.00	-8.70	-7.51	
7313.00	37.99	292.34	7116.29	-990.17	-220.58	-263.26	14404237 .91	1732103. 71	10.96	10.45	18.27	31.00	-8.93	-6.43	
7345.00	40.52	293.69	7141.06	-982.25	-239.22	-243.08	14404245 .83	1732085. 08	8.34	7.91	19.18	32.00	-9.37	-5.38	
7377.00	43.34	294.08	7164.87	-973.59	-258.76	-221.74	14404254 .49	1732065. 53	8.85	8.81	5.43	32.00	-9.87	-4.28	
7408.00	46.18	294.92	7186.88	-964.54	-278.62	-199.95	14404263 .54	1732045. 67	9.36	9.16	12.06	31.00	-10.60	-2.94	

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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
7440.00	48.84	295.44	7208.49	-954.50	-299.97	-176.38	14404273 .58	1732024. 32	8.40	8.31	8.38	32.00	-11.52	-1.41	
7472.00	51.48	296.51	7228.99	-943.73	-322.06	-151.82	14404284 .35	1732002. 23	8.64	8.25	17.63	32.00	-12.52	0.30	
7503.00	53.35	297.60	7247.90	-932.56	-343.93	-127.25	14404295 .52	1731980. 36	6.64	6.03	25.13	31.00	-13.38	1.93	
7535.00	54.27	299.44	7266.79	-920.22	-366.62	-101.43	14404307 .85	1731957. 67	5.46	2.88	58.77	32.00	-13.63	3.45	
7567.00	55.64	300.69	7285.17	-907.10	-389.29	-75.26	14404320 .98	1731935. 00	5.34	4.28	37.12	32.00	-13.12	4.54	
7598.00	57.92	302.63	7302.15	-893.48	-411.36	-49.40	14404334 .60	1731912. 93	9.03	7.35	35.98	31.00	-12.24	5.27	
7630.00	60.77	303.77	7318.47	-878.41	-434.39	-22.00	14404349 .67	1731889. 90	9.42	8.91	19.28	32.00	-11.44	5.47	
7662.00	63.06	304.86	7333.53	-862.49	-457.71	6.03	14404365 .59	1731866. 59	7.76	7.16	23.04	32.00	-10.68	5.42	
7693.00	66.29	305.48	7346.79	-846.35	-480.61	33.80	14404381 .73	1731843. 68	10.57	10.42	9.98	31.00	-10.14	5.18	
7725.00	69.27	305.57	7358.89	-829.14	-504.71	63.14	14404398 .94	1731819. 58	9.32	9.31	1.62	32.00	-9.97	5.01	
7756.00	71.95	306.20	7369.18	-812.00	-528.40	92.07	14404416 .08	1731795. 89	8.86	8.65	12.61	31.00	-9.99	4.97	
7788.00	74.41	306.03	7378.44	-793.95	-553.15	122.37	14404434 .13	1731771. 15	7.70	7.69	356.19	32.00	-10.09	5.05	
7820.00	76.56	306.83	7386.46	-775.55	-578.07	152.98	14404452 .53	1731746. 22	7.14	6.72	19.91	32.00	-10.06	5.30	
7851.00	78.15	307.20	7393.25	-757.34	-602.22	182.81	14404470 .74	1731722. 07	5.26	5.13	12.83	31.00	-9.72	5.47	
7883.00	79.71	309.28	7399.39	-737.91	-626.88	213.68	14404490 .17	1731697. 41	8.03	4.87	52.82	32.00	-8.85	5.29	
7915.00	81.34	309.20	7404.66	-717.94	-651.33	244.59	14404510 .14	1731672. 96	5.10	5.09	357.22	32.00	-7.52	4.78	
7946.00	83.20	309.79	7408.83	-698.40	-675.03	274.65	14404529 .68	1731649. 26	6.29	6.00	17.49	31.00	-5.84	4.41	
7978.00	85.81	310.14	7411.89	-677.95	-699.44	305.76	14404550 .13	1731624. 85	8.23	8.16	7.62	32.00	-4.00	4.04	
8010.00	88.21	311.00	7413.56	-657.16	-723.71	336.90	14404570 .92	1731600. 58	7.97	7.50	19.71	32.00	-2.44	3.54	

5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
8042.00	89.51	311.08	7414.20	-636.16	-747.84	368.01	14404591 .92	1731576. 45	4.07	4.06	3.52	32.00	-1.80	2.81	
8136.00	91.42	311.59	7413.43	-574.08	-818.42	459.32	14404654 .00	1731505. 87	2.10	2.03	14.95	94.00	-2.57	0.16	
8231.00	91.97	310.74	7410.62	-511.58	-889.91	551.63	14404716 .50	1731434. 39	1.07	0.58	302.93	95.00	-5.37	-2.23	
8326.00	90.00	307.74	7408.99	-451.50	-963.46	644.64	14404776 .58	1731360. 83	3.78	-2.07	236.74	95.00	-7.01	-1.43	
8421.00	92.53	309.96	7406.89	-391.93	-1037.42	737.78	14404836 .15	1731286. 87	3.54	2.66	41.24	95.00	-9.10	0.02	
8516.00	94.25	311.06	7401.28	-330.33	-1109.52	830.21	14404897 .74	1731214. 78	2.15	1.81	32.52	95.00	-14.68	-1.28	
8611.00	93.21	309.97	7395.10	-268.75	-1181.58	922.61	14404959 .33	1731142. 71	1.58	-1.09	226.32	95.00	-20.87	-2.59	
8706.00	92.16	308.49	7390.65	-208.74	-1255.09	1015.56	14405019 .34	1731069. 20	1.91	-1.11	234.65	95.00	-25.34	-1.78	
8800.00	92.28	307.65	7387.00	-150.82	-1329.03	1107.92	14405077 .26	1730995. 26	0.90	0.13	278.15	94.00	-28.97	0.93	
8895.00	90.99	307.87	7384.29	-92.67	-1404.11	1201.39	14405135 .41	1730920. 18	1.38	-1.36	170.32	95.00	-31.70	4.18	
8990.00	90.55	308.62	7383.02	-33.87	-1478.71	1294.75	14405194 .21	1730845. 58	0.92	-0.46	120.40	95.00	-32.98	6.63	
9085.00	90.86	308.75	7381.85	25.50	-1552.86	1387.97	14405253 .58	1730771. 43	0.35	0.33	22.75	95.00	-34.15	8.35	
9179.00	91.48	309.16	7379.93	84.59	-1625.94	1480.11	14405312 .67	1730698. 35	0.79	0.66	33.47	94.00	-36.06	9.61	
9274.00	91.11	309.29	7377.78	144.65	-1699.52	1573.13	14405372 .73	1730624. 77	0.41	-0.39	160.64	95.00	-38.21	10.44	
9369.00	90.31	308.00	7376.60	203.97	-1773.71	1666.36	14405432 .05	1730550. 58	1.60	-0.84	238.20	95.00	-39.39	12.22	
9464.00	90.92	308.13	7375.58	262.54	-1848.50	1759.78	14405490 .62	1730475. 79	0.66	0.64	12.03	95.00	-40.40	14.97	
9559.00	91.29	309.60	7373.75	322.14	-1922.45	1852.93	14405550 .22	1730401. 84	1.60	0.39	75.86	95.00	-42.24	16.39	
9653.00	91.42	310.52	7371.53	382.62	-1994.38	1944.69	14405610 .70	1730329. 92	0.99	0.14	81.94	94.00	-44.46	15.84	
9748.00	90.86	310.14	7369.64	444.09	-2066.78	2037.33	14405672 .17	1730257. 51	0.71	-0.59	214.16	95.00	-46.36	14.83	

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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
9843.00	91.30	310.38	7367.85	505.47	-2139.27	2130.01	14405733 .55	1730185. 03	0.53	0.46	28.60	95.00	-48.14	13.94	
9937.00	91.30	309.85	7365.72	566.02	-2211.13	2221.75	14405794 .10	1730113. 16	0.56	0.00	270.01	94.00	-50.27	13.30	
10033.00	92.34	309.69	7362.67	627.40	-2284.88	2315.54	14405855 .48	1730039. 41	1.10	1.08	351.26	96.00	-53.29	13.22	
10127.00	92.59	309.66	7358.62	687.36	-2357.17	2407.38	14405915 .44	1729967. 13	0.27	0.27	353.16	94.00	-57.32	13.30	
10222.00	92.90	309.28	7354.07	747.68	-2430.42	2500.24	14405975 .76	1729893. 87	0.52	0.33	309.25	95.00	-61.84	13.72	
10317.00	91.54	308.88	7350.39	807.52	-2504.10	2593.27	14406035 .60	1729820. 19	1.49	-1.43	196.39	95.00	-65.58	14.78	
10411.00	90.62	309.78	7348.62	867.08	-2576.80	2685.29	14406095 .16	1729747. 49	1.37	-0.98	135.63	94.00	-67.37	15.42	
10506.00	90.80	309.03	7347.45	927.39	-2650.20	2778.27	14406155 .46	1729674. 09	0.81	0.19	283.50	95.00	-68.54	15.95	
10601.00	91.91	309.30	7345.20	987.37	-2723.83	2871.31	14406215 .44	1729600. 46	1.20	1.17	13.66	95.00	-70.76	16.88	
10696.00	91.60	310.78	7342.29	1048.45	-2796.53	2964.04	14406276 .53	1729527. 76	1.59	-0.33	101.81	95.00	-73.69	16.35	
10791.00	90.92	311.34	7340.20	1110.84	-2868.14	3056.40	14406338 .92	1729456. 15	0.93	-0.72	140.53	95.00	-75.80	14.13	
10886.00	91.79	311.53	7337.95	1173.69	-2939.34	3148.62	14406401 .76	1729384. 95	0.94	0.92	12.31	95.00	-78.02	11.29	
10981.00	92.34	310.65	7334.53	1236.08	-3010.90	3240.94	14406464 .16	1729313. 40	1.09	0.58	302.04	95.00	-81.41	9.03	
11075.00	91.66	311.37	7331.25	1297.73	-3081.78	3332.32	14406525 .81	1729242. 51	1.05	-0.72	133.37	94.00	-84.72	6.92	
11170.00	91.30	311.78	7328.80	1360.75	-3152.83	3424.48	14406588 .83	1729171. 46	0.57	-0.38	131.29	95.00	-87.18	3.85	
11264.00	92.34	311.96	7325.81	1423.45	-3222.79	3515.53	14406651 .53	1729101. 50	1.12	1.11	9.81	94.00	-90.11	0.33	
11359.00	93.33	311.00	7321.11	1486.30	-3293.87	3607.64	14406714 .38	1729030. 42	1.45	1.04	315.94	95.00	-94.72	-2.58	
11454.00	92.16	309.59	7316.56	1547.66	-3366.25	3700.21	14406775 .74	1728958. 04	1.93	-1.23	230.32	95.00	-99.37	-3.53	
11549.00	91.48	309.54	7313.55	1608.14	-3439.44	3793.10	14406836 .22	1728884. 85	0.72	-0.72	184.20	95.00	-102.42	-3.27	

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5D Survey Report

Survey Points (Relative to Slot centre, TVD relative to Drill Floor)															
MD (US ft)	Inc (°)	Az (°)	TVD (US ft)	N.Offset (US ft)	E.Offset (US ft)	VS (US ft)	Northing (US ft)	Easting (US ft)	DLS (°/100 US ft)	B.Rate (°/100 US ft)	T.Face (°)	CL (US ft)	High to Plan (US ft)	Right to Plan (US ft)	Comment
11643.00	91.48	308.43	7311.12	1667.26	-3512.49	3885.21	14406895 .34	1728811. 80	1.18	0.00	270.01	94.00	-104.85	-2.06	
11738.00	90.86	308.06	7309.18	1726.06	-3587.08	3978.56	14406954 .13	1728737. 21	0.76	-0.65	210.83	95.00	-106.81	0.39	
11833.00	90.18	307.99	7308.32	1784.57	-3661.91	4071.99	14407012 .65	1728662. 38	0.72	-0.72	185.88	95.00	-107.68	3.20	
11928.00	90.25	307.63	7307.96	1842.81	-3736.97	4165.48	14407070 .89	1728587. 32	0.39	0.07	281.00	95.00	-108.04	6.37	
12023.00	90.53	309.55	7307.31	1902.06	-3811.22	4258.73	14407130 .14	1728513. 08	2.04	0.29	81.70	95.00	-108.68	8.25	
12118.00	91.42	310.81	7305.70	1963.35	-3883.79	4351.43	14407191 .43	1728440. 51	1.62	0.94	54.75	95.00	-110.27	7.49	
12214.00	91.23	309.96	7303.48	2025.53	-3956.89	4445.03	14407253 .61	1728367. 40	0.91	-0.20	257.41	96.00	-112.50	6.39	
12307.00	91.36	310.09	7301.37	2085.32	-4028.09	4535.83	14407313 .40	1728296. 20	0.20	0.14	44.99	93.00	-114.59	5.89	FINAL MWD SURVEY
12370.00	91.36	310.09	7299.88	2125.88	-4076.27	4597.32	14407353 .96	1728248. 02	0.00	0.00	0.00	63.00	-116.03	5.51	PROJ TO BIT

Formation Points (Relative to Slot centre, TVD relative to Drill Floor)					
Name	TVD (US ft)	MD (US ft)	F.Dip (°)	F.Dir (°)	
BEREA	2421.00	2421.18	0	0	
BURKET	7205.00	7434.72	0	0	
MAHANTANGO	7224.00	7464.04	0	0	
TULLY	7242.00	7493.19	0	0	
UPPER MARCELLUS	7319.00	7631.09	0	0	
LOWER MARCELLUS	7340.00	7676.66	0	0	
ONONDAGA	7388.00	7826.71	0	0	

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