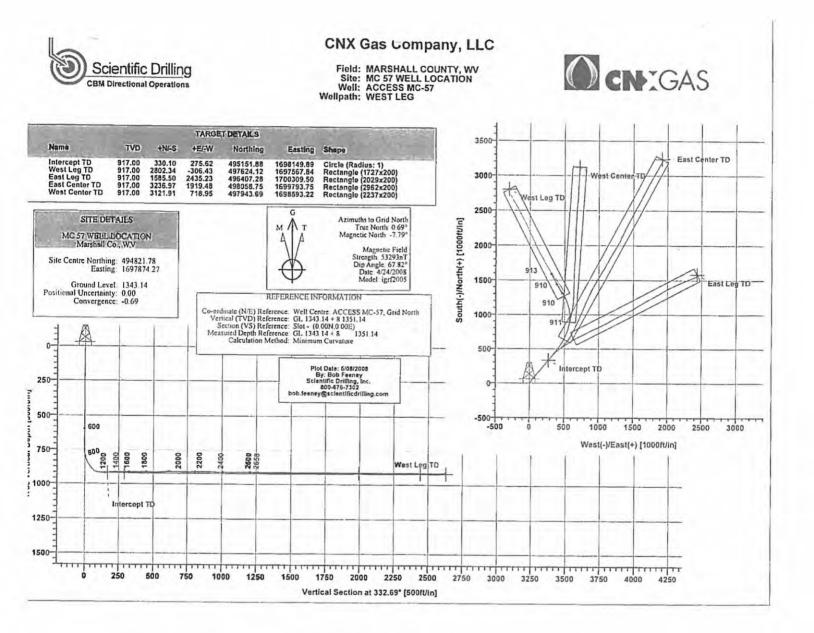
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SEP 2 5 2017

WV Decommont of Environmental Protection

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Scientific Drilling Survey Report

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									Erw	icensis and Easter	
Compaoy: Field: Site: Well: Wellpath:	MARSHA MC 57 W ACCESS		W			Date: 5/8/20 Co-ordinate(N Vertical (TVD) Section (VS) R Survey Calcula	E) Reference) Reference eference:	ce: V : G V	GL 1343.14 + i	00E,332.69Azi))
Field:		ALL COUNTY n West Virginia		sylvania Oper	alions						
Geo Datur	m:US Stat	e Plane Coordi (Clarke 1866) ea Level	inate Syste	:m 1927		Map Zone: Coordinate Geomagne	e System:	Wei	st Virginia, No I Centre 2005	orthem Zone	
Site:	MC 57 \	WELL LOCATI	ON								
Site Positio From: Position U: Ground Le	on: Map scertainty:	II Co., WV 0.00 1343.14	Easti) ft		821.78 ft 874.27 ft		: rence:	39 51 80 34			
Well:		S MC-57				Slot Name:			0.00 009		
Well Positi	ion: ·	+N/-S 0.00) ft Easti		821.78 ft 874.27 ft	Latitude:		39 51 80 34			
	WESTI			······		Drilled Fro		Surf	202		
Current Di Magnetic I Field Stren Vertical Se	atum: (Data: ngth:	GL 1343.14 + 6 4/24/2008 53293 cepth From (TV ft	l daT	Height 1 +NV-S ft	351.14 ft	Tie-on Dep	oth: tem Datum: 1;	: Mea	0.00 ft in Sea Level -8.48 deg 67.82 deg ction		
		14				4		uey			
Date: 5/7	ogram for l 7/2008	1351.14 Definitive Wellp Validated		0.00		0.00 Version: 3		332.69		1,000,00,00,00,000,000,000,000,000,000,	
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Date: 5/7 Actual Fro ft 50.00	ogram for I 7/2008 om To fl 646.00	Definitive Wellp Validated Survey Survey #	: No 1	0.00 +N/-S R	+E/-W	Version: 3 Toolcode Drop Gyro-SY MWD-SDI-SY	/S I /S S DLS	Tool Nam Drop Gyr Scientific Build	ie o Systematic	natic Tool/Comment	
Date: 5/7 Actual Fro ft 50.00 646.00 Survey MD ft 0.00	ogram for I 7/2008 5m To ft 646.00 2658.00 Jaci deg 0.48	Definitive Wellp Validated Survey Survey # Survey # Azim deg 226.20	1 2 TVD R 0.00	+N/-S ft 0.00	ft 0.00	Version: 3 Toolcode Drop Gyro-SY MWD-SDI-SY VS ft 0.00	(S) (S) (S) (DLS (deg/100) 0.00	Tool Nam Drop Gyr Scientific Build R deg/10 0.00	o Systematic MWD System Turn Oft deg/100ft 0.00	Tool/Comment	
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Date: 5/7 Actual Fro ft 50.00 646.00 Survey MD ft 0.00 100.00 200.00 300.00 400.00 500.00 500.00 500.00 500.00 500.00 1000.00 1000.00 1000.00 1300.00 1400.00 1500.00 1600.00	ogram for I 7/2008 m To ft 646.00 2658.00 Incl deg 0.48 0.17 0.23 0.42 0.32 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34 89.19 90.65 91.82 90.92 89.42	Definitive Wellp Validated Survey # Survey # Azim deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46 40.17 36.60 34.45 30.27	E No 1 2 TVD ft 0.00 100.00 200.00 300.00 399.99 499.99 599.99 599.99 699.99 797.25 866.49 904.82 916.13 918.56 916.16 913.23 913.01	+N/-S R 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 137.36 213.75 291.42 367.37 445.65 526.46 611.23	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15 0.71 0.71 11.24 54.04 112.19 175.48 238.40 303.44 365.59 424.42 477.41	Version: 3 Toolcode Drop Gyro-SY MWD-SDI-SY r vs ft 0.00 -0.05 -0.06 -0.05 -0.06 -0.59 -1.30 -1.87 -2.53 -3.29 3.87 33.82 70.58 109.42 149.56 187.20 228.24 273.05 324.07	CS DLS deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50 16.48 10.75 2.88 1.62 3.75 2.34 4.43	Tool Nam Drop Gyr Scientific Build ft deg/10 0.00 -0.31 0.06 0.19 -0.10 0.16 -0.14 0.30 27.09 31.38 16.47 10.75 2.85 1.46 1.17 -0.90 -1.49	Turn MWD System 00t deg/100tt 00t deg/100tt 00t deg/100tt 0000 47.90 -73.80 -48.80 18.80 -44.20 13.90 26.50 -131.14 4.24 -0.61 0.05 0.42 0.71 -3.57 -2.16 -4.18	Tool/Comment TiE LINE Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS	
Date: 5/7 Actual Fro ft 50.00 646.00 Survey MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1000.00 1100.00 1300.00 1400.00 1500.00	ogram for I 7/2008 bm To fi 646.00 2658.00 Incl deg 0.48 0.17 0.23 0.42 0.32 0.42 0.32 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34 89.19 90.65 91.82 90.92	Definitive Wellp Validated Survey Survey Azim deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46 40.17 36.60 34.45	E No TVD ft 0.00 100.00 200.00 300.00 399.99 499.99 599.99 599.99 699.99 797.25 866.49 904.82 916.13 918.56 916.16 913.23	+N/-S ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 137.36 213.75 291.42 367.37 445.65 526.46	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15 0.71 0.71 11.24 54.04 112.19 175.48 238.40 303.44 365.59 424.42	Version: 3 Toolcode Drop Gyro-SY MWD-SDI-SY VS ft 0.00 -0.05 -0.06 -0.59 -1.30 -1.87 -2.53 -3.29 3.87 33.82 70.58 109.42 149.56 187.20 228.24 273.05	CS DLS deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50 16.48 10.75 2.88 1.62 3.75 2.34	Tool Nam Drop Gyr Scientific Build At deg/10 0.00 -0.31 0.06 0.19 -0.10 0.16 -0.14 0.30 27.09 31.38 16.47 10.75 2.85 1.46 1.17 -0.90	Turn MWD System 00ft deg/100ft 0.00 47.90 -73.80 -48.80 18.80 18.80 -44.20 13.90 26.50 -131.14 4.24 -0.61 0.05 0.42 0.71 -3.57 -2.16	Tool/Comment TiE LINE Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS	
Date: 5/7 Actual Fro ft 50.00 646.00 Survey MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 1000.00 1200.00 1200.00 1300.00 1400.00 1500.00 1500.00 1600.00 1700.00	ogram for I 7/2008 bm To ft 646.00 2658.00 	Definitive Wellp Validated Survey # Survey # Azim deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.60 35.36 39.60 38.99 39.04 39.46 40.17 36.60 34.45 30.27 23.82	E No 1 2 TVD ft 0.00 100.00 200.00 300.00 399.99 499.99 599.99 599.99 699.99 797.25 866.49 904.82 916.13 918.56 916.16 913.23 913.01 913.49	+N/-S ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 137.36 213.75 291.42 367.37 445.65 526.46 611.23 700.58	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15 0.71 0.71 11.24 54.04 112.19 175.48 238.40 303.44 365.59 424.42 477.41 522.15	Version: 3 Toolcode Drop Gyro-SY MWD-SDI-SY VS ft 0.00 -0.05 -0.06 -0.59 -1.30 -1.87 -2.53 -3.29 3.87 33.82 70.58 109.42 149.56 187.20 228.24 273.05 324.07 382.92	CS DLS deg/1000 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50 16.48 10.75 2.88 1.62 3.75 2.34 4.43 6.81	Tool Nam Drop Gyr Scientific Build ft deg/10 0.00 -0.31 0.06 0.19 -0.10 0.16 -0.14 0.30 27.09 31.38 16.47 10.75 2.85 1.46 1.17 -0.90 -1.49 2.18	Turn MWD System Turn 00ft deg/100ft 0.00 47.90 -73.80 -48.80 18.80 -44.20 13.90 26.50 -131.14 4.24 -0.61 0.05 0.42 0.71 -3.57 -2.16 -4.18 -6.45	Tool/Comment TiE LINE Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS Drop Gyro-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS MWD-SDI-SYS	

Scientific Drilling

Survey Report

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Company: Field: Site: Well: Wellpath:	MARSHA		NV		Ca Va Se	ertical (TVD) ection (VS) R	E) Reference: Reference:	GL We	12:51:59 1: ACCESS N 1343.14 + 8 1 (0.00N,0.00 imum Curvat	1351.1 E,332.69	Azi)	2 Sybase
Survey											-	
MD ft	laci deg	Azim deg	TVD ft	+N/-S fl	+ E/-W ft	VS ft	DLS deg/100ft	Build deg/100	Turn t deg/100ft	Tool/Co	mment	
2200.00	91.66	338.25	809.41	1186.85	537.42	807.99	10.39	3.70	-9.71	MWD-S	DI-SYS	
2300.00	88.10	328.36	908.08	1275.33	491.21	907.81	10.51	-3.56	-9.89	MWD-S		
2400.00	89.43	327.87	910.76	1359.83	437.83	1007.39	1.41	1.33	-0.49	MWD-S		
2500.00	91.88	331.71	910.14	1446.25	387.60	1107.22	4.55	2.44	3.84	MWD-S	nleve	
2600.00	86.91	333.46	910.20	1534.92	341.50	1207.15	5.26	-4.96	1.75	MWD-S		
2658.00	86.91	333.46	913.32	1586.73	315.63	1265.06	0.00	0.00	0.00	MWD-S		
Targets												
Name		Description	TVD ft	+N/-S ft	+E/-\ ft				- Latitude Deg Min See		— Long eg Min	itude Sec
Interce -Cin	pt TD cle (Radius	: 1)	917.00	330.10	275.6	2 49515	1.88 1698149	9.89	39 51 16.22	4 N 8	0 34 3	0.660 W
West L			917.00	2802.34	-306.4	3 49762	4.121697567	7.84 ;	39 51 40.58	7N 8	0343	8.503 W

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Scientific Drilling Survey Report - Geographic

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				CH CH		ug				
			Surve	y Repo	ort - Geog	raphic		V/A Enviro	/ Denarth niaisritaí l	nent of Protection
	ALL COUNTY, W /ELL LOCATION 1 MC-57	N			Date: 5/8/2000 Co-ordinate(NE) Vertical (TVD) F Section (VS) Ref Survey Calculati	Reference: Reference: erence:	GL 1343. Well (0.00		Pag 7, Grid Noi .1 2.69Azi)	e: 1
	ALL COUNTY, n West Virginia		vania Oper	ations						
Map System:US Sta Geo Datum: NAD27 Sys Datum: Mean S	(Clarke 1866)	nate System	1927		Map Zone: Coordinate S Geomagnetic	ystem:	Vest Virgini Vell Centre grf2005	a, Northern	Zone	
Site: MC 57	WELL LOCATIC	N								
Marsha Site Position: From: Map Position Uncertainty Ground Level:	11 Co., WV : 0.00 1343.14			821.78 ft 874.27 ft	Latitude: Longitude: North Refere Grid Conver	80 : :nce:	Grid	W		
Well: ACCES	S MC-57			*****	Slot Name:					
	+N/-S 0.00 +E/-W 0.00 : 0.00	ft Easting		821,78 ft 874.27 ft	Latitude: Longitude:		51 12.929 34 34.143			
Magnetic Data: Field Strength:	GL 1343.14 + 8 4/24/2008 53293 Jepth From (TVI		+N/-S	351.14 ft	Drilled From Tie-on Depth Above Syster Declingtion; Mag Dip Ang +E/-W	: n Datum: ;le:]	Surface 0.00 Aean Sea L -8,48 67.82 Direction	evel deg		
	ft 1351.14		ft 0.00		ft 0.00		deg 2.69		······	
Survey Program for Date: 5/7/2008 Actual From To ft ft	Defialtive Wellpa Validated: Survey				Version: 3 Toolcode	Tool	Name			
50.00 646.00 646.00 2658.00					Drop Gyro-SYS MWD-SDI-SYS		Gyro Syster tific MWD S		<u> </u>	
Survey										
MD incl ft deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	< Lat Deg Min	titude> 1 Sec	< Lon Deg Mir	gitude> 1 Sec
0.00 0.48 100.00 0.17 200.00 0.23 300.00 0.42 400.00 0.32	226.20 274.10 200.30 151.50 170.30	0.00 100.00 200.00 300.00 399.99	0.00 -0.22 -0.36 -0.89 -1.56	0.00 -0.32 -0.55 -0.43 -0.19	494821.78 494821.56 494821.42 494820.89 494820.22	1697874.27 1697873.95 1697873.72 1697873.84 1697874.08	39 51 39 51 39 51 39 51 39 51 39 51	12.929 N 12.927 N 12.925 N 12.920 N 12.913 N	80 34 80 34 80 34 80 34 80 34	34.143 W 34.147 W 34.150 W 34.148 W 34.145 W
500.00 0.48 600.00 0.34 700.00 0.64 800.00 27.74	126.10 140.00 166.50 35.36	499.99 599.99 699.99 797.25	-2.03 -2.48 -3.34 10.16	0.15 0.71 0.71 11.24	494819.75 494819.30 494818.44 494831.94	1697874.42 1697874.98 1697874.98 1697874.98 1697885.51	39 51 39 51 39 51 39 51 39 51	12.909 N 12.904 N 12.896 N 13.031 N	80 34 80 34 80 34 80 34 80 34	34.141 W 34.133 W 34.133 W 34.000 W
900.00 59.11	39.60	866.49	65.96	54.04	494887.74	1697928.31	39 51	13.587 N	80 34	33.460 W
1000.00 75.58 1100.00 86.34 1200.00 89.19 1300.00 90.65 1400.00 91.82	38.99 39.04 39.46 40.17 36.60	904.82 916.13 918.78 918.56 916.16	137.36 213.75 291.42 367.37 445.65	112.19 175,48 238,40 303,44 365,59	494959.14 495035.53 495113.20 495189.15 495267.43	1697986.46 1698049.75 1698112.67 1698177.71 1698239.86	39 51 39 51 39 51 39 51 39 51 39 51	14,300 N 15.052 N 15.837 N 16.595 N 17.376 N	80 34 80 34 80 34 80 34 80 34 80 34	32.726 W 31.926 W 31.131 W 30.309 W 29.524 W
	34.45	913.23 913.01	526.46 611.23	424.42 477.41	495348.24 495433.01	1698298.69 1698351.68	39 51 39 51	18.182 N 19.026 N	80 34 80 34	28.782 W 28.115 W
1500.0090.921600.0089.421700.0091.611800.0089.711900.0092.17	30.27 23.82 15.22 7.44	913.49 911.29 911.62	700 58 794.63 892.54	522.15 555.75 575.65	495522.36 495616.41 495714.32	1698396.42 1698430.02 1698449.92	39 51 39 51 39 51	19.914 N 20.848 N 21.817 N	80 34 80 34 80 34	27.555 W 27.139 W 26.899 W

Scientific Drilling Survey Report - Geographic

Company: Field: Site: Well: Wellpath:	MARSHA		w		Ver Sec	e: 5/8/2008 ordinate(NE) tical (TVD) R tion (VS) Refe vey Calculatio	Reference: eference: rence:	ne: 12:54:03 Well: ACCESS MC-57 GL 1343.14 + 8 1351, Well (0.00N,0.00E,332 Minimum Curvature	1
Survey									· · ·
MD ft	luci deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	- Latitude> Deg Min Sec	< Longitude Deg Min Sec
2100.00	87.97	347.96	908.91	1091.18	566.06	495912.96	1698440.33	39 51 23,779 N	80 34 27.052
2200.00	91.66	338.25	909.41	1186.85	537.42	496008.63	1698411.69	39 51 24.721 N	
2300.00	88.10	328.36	808.08	1275.33	491.21	496097.11	1698365.48	39 51 25.590 N	
2400.00	89.43	327.87	910.76	1359.83	437.83	496181.61	1698312.10	39 51 26.419 N	80 34 28.040 80 34 28.738
2500.00	91.88	331.71	910.14	1446.25	387.60	496268.03	1698261.87	39 51 27.267 N	
2600.00	86.91	333.46	910.20	1534.92	341.50		1698215.77	39 51 27.207 N	80 34 29.395
2658.00	86.91	333.46	913.32	1586.73			1698189.90	39 51 28.647 N	80 34 30.000 1 80 34 30.339 1
Targets									
Name		Description	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map g Easting ft	< Latitude> Deg Min See	< Longitude Deg Min Sec
Interce -Circ	pt TD de (Radius	: 1)	917.00	330.10	275.62	495151.8	81698149.89	39 51 16.224 N	80 34 30.660 W
West L		•	917.00	2802.34	-306.43	497624.1	21697567.84	39 51 40.587 N	80 34 38.503 W

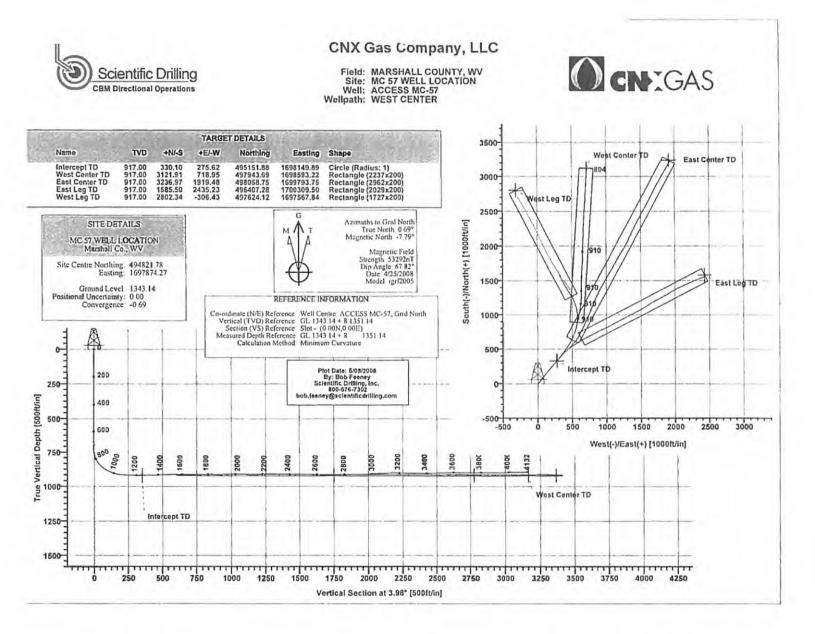
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Scientific Drilling Survey Report

	-	1. O LO.		SC	ienti	tic Dri	lling				
E	ND'	erent of Erection	ion		Surve	ey Repo	rt _				
Company: Field: Site: Well: Wellpath:	MARSH MC 57 V ACCES		.wv			Date: 5/8/2 Co-ordinate(1 Vertical (TVI Section (VS) 1 Survey Calcu	NE) Referen D) Referenc Reference:	ace: W e: G W	13:17:55 /ell: ACCESS L 1343.14 + /ell (0.00N,0.1 inimum Curv	00E,3.98Azi)	I Sybase
Field:	MARS	HALL COUNT m West Virgin	Y, W								
Map Syste Geo Datur Sys Datur	U.S.A. em:US Sta m: NAD27	ile Plane Coor / (Clarke 1866	dinate Syste		raions		e: te System: etic Model:	Weil	t Virginia, No Centre 005	rthern Zone	
Site:	MC 57	WELL LOCAT	TION								
Site Positi From: Position U Ground L	oo: Map Incertainty	ul Co., WV • 0.(1343.*	Norti Easti 20 ft 14 ft		4821.78 ft 7874.27 ft	Latitude: Lougitude North Ref Grid Con	:: ference:	39 51 80 34	12.929 N 34.143 W Grid -0.69 deg		
Well:	ACCES	SS MC-57				Slot Name	:		····		
Well Posit Position U		+E/-W 0.0	00 ft North 10 ft Eastin 10 ft	ning: 494 ng: 1697	1821.78 ft 7874.27 ft	Latitude: Longitude	*		12.929 N 34.143 W		
Wellpath: Current D Magnetic I Field Stree Vertical Se	atum: Data: ngth:	CENTER GL 1343.14 + 4/25/200 5329 5329 Deptb From (T ft	08 92 nT	Height 1 +N/-S ft	351.14 ft 5	Declinatio Mag Dip A +E/-W	pth: item Datum u:	1 :: Mear Direc	T LEG 890.00 ft Sea Level -8.48 deg 67.82 deg tion		
		0.00		0.00		ft 0.00		deg 3.98			
Date: 5/4 Actual Fro ft 50,00	4/2008 0m To fi 646.00		d: No #1 (0)			Version: 0 Toolcode Drop Gyro-S`	- 	Teol Name	: Systematic		
646.00 1890.00	1890.00 4132.00					MWD-SDI-SY MWD-SDI-SY	/S	Scientific I	WWD System WWD System	natic Iatic	
Survey											
MD ft	lac) deg	Azim deg	TVD ft	+N/-S ft	+E/-W fl	VS ft	DLS deg/100	Build ft deg/100	Tura It deg/100ft	Tool/Comment	
0.00 100.00	0.48 0.17	226.20 274.10	0.00 100.00	0.00	0.00 -0.32	0.00	0.00	0.00	0.00	TIE LINE	
200.00	0.23	200.30	200.00	-0.36	-0.55	-0.24 -0.39	0.39 0.24	-0.31 0.06	47.90 -73.80	Drop Gyro-SYS Drop Gyro-SYS	
300.00 400.00	0.42 0.32	151.50 170.30	300.00 399.99	-0.89 -1.56	-0.43 -0.19	-0.92 -1.57	0.32 0.16	0.19 -0.10	-48.80	Drop Gyro-SYS	
							0.10	-0.10	18.80	Drop Gyro-SYS	
500.00 600.00	0.48 0.34	126.10 140.00	499.99 599.99	-2.03 -2.48	0.15 0.71	-2.02 -2.43	0.34 0.17	0.16	-44.20	Drop Gyro-SYS	
700.00	0.64	166.50	699.99	-2.40 -3.34	0.71	-2.43 -3.28	0.17	-0.14 0.30	13.90 26.50	Drop Gyro-SYS MWD-SDI-SYS	
800.00	27.74	35.36	797.25	10.16	11.24	10.92	28.17	27.09	-131.14	MWD-SDI-SYS	
900.00	59.11	39.60	866.49	65.96	54.04	69.56	31.50	31.38	4.24	MWD-SDI-SYS	
000.00	75.58	38.99	904.82	137.36	112.19	144.82	16.48	16.47	-0.61	MWD-SDI-SYS	
100.00	86.34 89.19	39.04 39.46	916.13 918.78	213.75 291.42	175.48 238.40	225.42 307. 26	10.75 2.88	10.75	0.05	MWD-SDI-SYS	
300.00	90.65	40.17	918.56	367.37	238.40	307.26	2.00	2.85 1.46	0.42 0.71	MWD-SDI-SYS MWD-SDI-SYS	
400.00	91.82	36.60	916.16	445.65	365.59	469.95	3.75	1.17	-3.57	MWD-SDI-SYS	
	90.92	34.45	913.23	526.46	424.42	554.65	2.34	-0.90	-2.16	MWD-SDI-SYS	
1500.00		30.27	913.01	611.23	477.41	642.89	4.43	-1.49	-4.18	MWD-SDI-SYS	
1600.00	89.42							2.18	-6.45		
1600.00 1700.00	91.61	23.82	913.49	700.58	522.15	735.13	6.81			MWD-SDI-SYS	
1500.00 1600.00 1700.00 1800.00 1800.00			913.49 911.29	794.63	555.75	831.29	8.80	-1.90	-8.60	MWD-SDI-SYS	
1600.00 1700.00 1800.00	91.61 89.71	23.82 15.22	913.49								

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Scientific Drilling Survey Report

VM Decertmont of Environmental Protoction

Company: Field: Site: Well: Wellpath:	MARSHAI MC 57 WE ACCESS		w		Ve Sei	te: 5/8/200 -ordinate(NE rtical (TVD) :tion (VS) Re rvey Calculat) Reference: Reference: ference:	GL 1 Well	3:17:55 ACCESS I 343.14 + 8 (0.00N,0.00 num Curval	1351.1)E,3.98Azi)		
Survey												
MD ft	inci deg	Azim deg	TVD fl	+N/-S ft	+E/-W ft	VS ft	DLS deg/100ft	Build deg/100ft	Turn deg/100ft	Tool/Con	ment	
2100.00	88.20	7.68	911.15	1087.67	618.37	1127.97	6.13	-3.17	-5.25	MWD-SC	-SYS	
2200.00	92.25	4.37	909.32	1186.86	630.68	1227,77	5.23	4.05	-3.31	MWD-SD	DI-SYS	
2300.00	88.33	0.64	908.47	1286.76	633.81	1327.65	5.41	-3.92	-3.72	MWD-SE	I-SYS	
2400.00	88.88	1.36	910.73	1386.69	636.75	1427.54	0.90	0.56	0.71	MWD-SE	I-SYS	
2500.00	90.57	1,57	911.36	1486.66	638.59	1527.40	1.70	1.68	0.21	MWD-SC	N-SYS	
2600.00	87.80	3.03	911.67	1586.55	643.02	1627.35	3.13	-2.77	1.46	MWD-SC	I-SYS	
2700.00	90.24	4.03	915.37	1686.29	648.89	1727.26	2.64	2.45	1.00	MWD-SD	I-SYS	
2800.00	92.63	2,40	910.81	1785.86	656.67	1827.13	2.89	2,39	-1.63	MWD-SD	I-SYS	
2900.00	89.80	1.01	910.68	1885.81	659.03	1927.01	3.16	-2.83	-1.39	MWD-SD	I-SYS	
3000.00	92,16	1.80	906.79	1985.70	661.20	2026.81	2.49	2.36	0.79	MWD-SD	I-SYS	
3100.00	91.44	2.71	903.25	2085.56	664.86	2126.68	1.17	-0.72	0.92	MWD-SD		
3200.00	88.51	0.85	802.22	2185.45	668.28	2226.57	3.47	-2.93	-1.86	MWD-SD		
3300.00	8 9 .67	3.10	903.43	2285.39	671.17	2326.47	2.53	1.16	2.25	MWD-SD	I-SYS	
3400.00	90.00	3.71	903.54	2385.23	676. 9 4	2426.46	0.69	0.33	0,61	MWD-SD	I-SYS	
3500.00	92.22	3.41	901.34	2485.01	683,10	2526.43	2.24	2.22	-0.30	MWD-SD	I-SYS	
3600.00	91.27	4.89	898.71	2584.73	690.01	2626.38	1.76	-0.95	1.48	MWD-SD		
3700.00	88.31	3.70	898.50	2684.39	697.70	2726.35	3.19	-2.96	-1.18	MWD-SD		
3800.00	89.96	2.92	899.66	2784.22	703.42	2826.33	1.83	1.65	-0.78	MWD-SD	I-SYS	
3900.00	90.27	2.81	899.83	2884.11	708.09	2926.30	0.33	0.31	-0.10	MWD-SD	I-SYS	
4000.00	92.11	2.87	896.62	2983.86	714.19	3026.23	1.84	1.84	0.06	MWD-SD	I-SYS	
4100.00	91.58	3.05	894.81	3083.73	718.84	3126.19	0.56	-0.53	0.18	MWD-SD	I-SYS	
4132.00	92.78	3.44	893.59	3115 65	720.65	3158.16	3.93	3.74	1.21	MWD-SD		
Targets												
Name		Description	TVD ft	+N/-S ft	+E/-V fì	Map V Northi ft			Latitude eg Min Se	> < c De	- Long g Min	jitude — Sec
	cle (Radius:	: 1)	917.0		275.62		.88 1698149		9 51 16.22			0.660 W
	Center TD ctangle (22:	37x200)	917.0	3121.91	718.9	5 497943	.69 1698593	3.22 3	9 51 43.86	56 N 80	34 2	5.403 V

Scientific Drilling Survey Report - Geographic

W// Departmont of Environmental Fredection

SEP 2 5 2017

470 5 1.0 1 1. 0 0 0 0

Field: Site: Well:	MARSHAL		WV			Date: 5/8/200 Co-ordinate(NE) Vertical (TVD) F Section (VS) Ref Survey Calculati	Reference: Reference: erence:	GL 1343. Well (0.0(51 CESS MC-57, 14 + 8 1351.1 N,0.00E,3.98 Curvature	Azi)	:: 1 th Sybase
Field:		LL COUNTY West Virgini	Y, WV a and Penns	/Ivania Ope	rations						
Geo Datum	m:US State	larke 1866)	dinate Systen	1927		Map Zone: Coordinate S Geomagnetic		West Virgini Well Centre igrf2005	a, Northern Zi	one	
Site:	MC 57 W	ELL LOCAT	ION						······	******	
Site Positio From: Position Us Ground Le	Map scertainty:	•	North Eastin 0 ft 4 ft	ing: 494 g: 1697	821.78 ft 874.27 ft		80 BCC:	51 12.929 34 34.143 Grid -0.69	W		
Well:	ACCESS	MC-57				Slot Name:				_	
Well Position	+E	/-W 0.0	0 ft North 0 ft Enstin 0 ft		821.78 ft 874.27 ft	Latitude: Longitude:		51 12.929 34 34.143			
Wellpath: Current Da Magnetic D Field Streng Vertical Sec	ata: gth:	. 1343.14 + (4/25/200	8 2 nT	Height 1 +N/-S ft	351.14 ft	Drilled From Tie-on Depth Above Systen Declination: Mag Dip Ang +E/-W ft	: n Dstum: ;le:	WEST LEG 1890.00 Mean Sea Lu -8.48 67.82 Direction deg	evel deg		
		0.00		0.00		0.00		3.98			
Date: 5/4 Actual From ft 50.00 646.00 1890.00	2008	finitive Welly Validated Survey Survey # Survey # Survey #	d: No +1 (0) +2 (0)			Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS MWD-SDI-SYS	Drop Scier	Name Gyro Systen httfic MWD S httfic MWD S	ystematic		
Survey				*******							
MD ft	laci deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing ft	Map Easting ft	< Lat Deg Min		< Long Deg Min	itude> See
0.00 100.00 200.00 300.00 400.00	0.48 0.17 0.23 0.42 0.32	226.20 274.10 200.30 151.50 170.30	0.00 100.00 200.00 300.00 399.99	0.00 -0.22 -0.36 -0.89 -1.56	0.00 -0.32 -0.55 -0.43 -0.19	494820.89	1697874.27 1697873.95 1697873.72 1697873.84 1697874.08	39 51 39 51 39 51 39 51 39 51 39 51	12.920 N	80 34 80 34 80 34	34.143 W 34.147 W 34.150 W 34.148 W 34.148 W
500.00 600.00 700.00 800.00 900.00	0.48 0.34 0.64 27.74 59.11	126.10 140.00 166.50 35.38 39.60	499.99 599.99 699.99 797.25	-2.03 -2.48 -3.34 10.16	0.15 0.71 0.71 11.24	494819.30 494818.44 494831.94	1697874.42 1897874.98 1697874.98 1697885.51	39 51 39 51 39 51 39 51	12.904 N 12.896 N 13.031 N	80 34 80 34 80 34 80 34	34.141 W 34.133 W 34.133 W 34.000 W
1000.00 1100.00 1200.00 1300.00 1400.00	59.11 75.58 86.34 89.19 90.65 91.82	38.99 39.04 39.46 40.17	866.49 904.82 916.13 918.78 918.56 918.56	65.96 137.36 213.75 291.42 367.37	54.04 112.19 175.48 238.40 303.44	494959.14 495035.53 495113.20 495189.15	1697928.31 1697986.46 1698049.75 1698112.67 1698177.71	39 51 39 51	14.300 N 15.062 N 15.837 N 16.695 N	80 34 80 34 80 34 80 34	33.460 W 32.726 W 31.926 W 31.131 W 30.309 W
1500.00 1600.00 1700.00 1800.00	91.82 90.92 89.42 91.61 89.71	36.60 34.45 30.27 23.82 15.22	916.16 913.23 913.01 913.49 911.29	445.65 526.46 611.23 700.58 794.63	365.59 424.42 477.41 522.15 555.75	495348.24 495433.01 495522.36	1698239.86 1698298.69 1698351,68 1698396.42 1698430.02	39 51 39 51 39 51	18.182 N 19.026 N 19.914 N	BO 34 BO 34 BO 34	29.524 W 28.782 W 28.115 W 27.555 W 27.139 W

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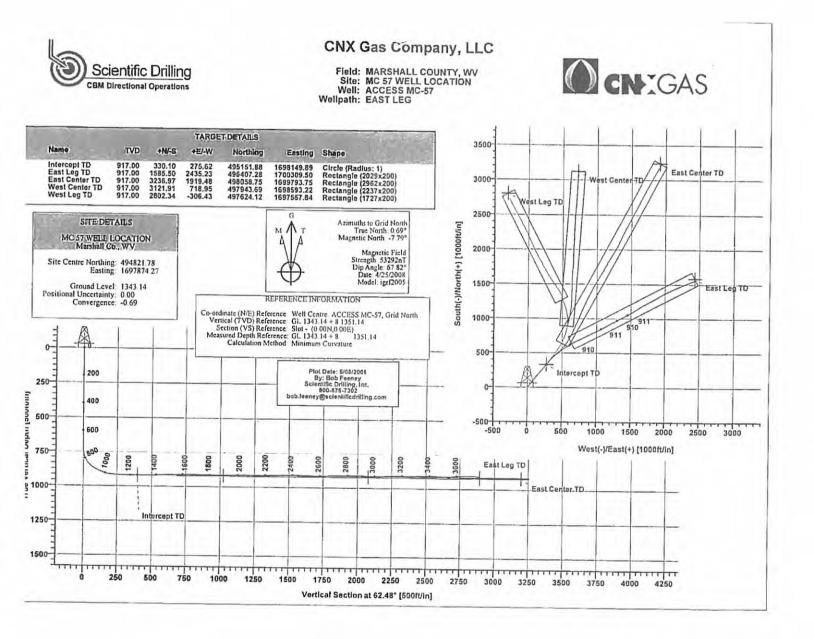
Scientific Drilling Survey Report - Geographic

Company: Field: Site: Vell:	MARSHA	Company, LLO LL COUNTY, N ELL LOCATIO	Ŵ		Co- Ver	e: 5/8/2008 ordinate(NE) I tical (TVD) Re tion (VS) Refer	Reference: eference:	GL 1343.1	51 ESS MC+57 4 + 8 1351. N,0.00E,3.9	1	
Wellpath:					Sur	vey Calculation	n Method:	Minimum (Sybase
Survey							•				
MD	1	A -1	710			Мар	Map	< Lat	itude>		gitude -
мш ft	luci deg	Azim deg	TVD ft	+N/-S ft	+E/-W fl	Northing ft	Easting ft	Deg Min	Sec	Deg Mir	i Sec
2000.00	91.37	12.93	908.77	989.46	600.06	495811.24	1698474.33	39 51	22.778 N	80 34	26.601 V
2100.00	88.20	7.68	911.15	1087.67	618.37		1698492.64	39 51	23.751 N	80 34	26.381
2200.00	92.25	4.37	909.32	1186.86	630.68		1698504.95	39 51	24.733 N	80 34	26.238 V
2300.00	88.33	0.64	908.47	1286.76	633.81		1698508.08	39 51	25.720 N	80 34	26.214 V
2400.00	88.88	1.36	910.73	1386.69	636.75		1698511.02	39 51	26.708 N	80 34	26.191 V
2500.00	90.57	1,57	911.36	1486.66	638.59	496308.44	1698512.86	39 51	27.696 N	80 34	26.183 V
2600.00	87.80	3.03	911.67	1586.55	643.02		1698517.29	39 51	28.684 N	80 34	26.141 V
2700.00	90.24	4.03	915.37	1686.29	648.89		1698523.16	39 51	29.670 N	80 34	26.081 V
2800.00	92.63	2.40	910.81	1785.86	656.67		1698530.94	39 51	30.655 N	80 34	25.997 V
2900.00	89.80	1.01	910.68	1885.81	659.03		1698533.30	39 51	31.643 N	80 34	25.982 V
3000.00	92.16	1.80	906.79	1985.70	661.20	496807.48	1698535.47	39 51	32.631 N	80 34	25.970
3100.00	91.44	2.71	903.25	2085.56	664.86		1698539.13	39 51	33.618 N	80 34	25.938 V
3200.00	88.51	0.85	902.22	2185.45	668.28		1698542.55	39 51	34.606 N	80 34	25.909
3300.00	89.67	3.10	903.43	2285.39	671.17		1698545.44	39 51	35.594 N	80 34	25.888 V
3400.00	90.00	3.71	903.54	2385.23	676.94		1698551,21	39 51	36.581 N	80 34	25.829 V
3500.00	92.22	3.41	901.34	2485.01	683.10	497306.79	1698557.37	39 51	37.568 N	80 34	25.765 V
3600.00	91.27	4.89	898.71	2584.73	690.01		1698564.28	39 51	38.554 N	80 34	25.692 V
3700.00	88.31	3.70	898.50	2684.39	697.70		1698571.97	39 51	39.540 N	80 34	25.609 V
3800.00	89.96	2,92	899.66	2784.22		497605.00	1698577.69	39 51	40.527 N	80 34	25.551 V
3900.00	90.27	2.81	899.83	2884.11	708.09		1698582.36	39 51	41.515 N	80 34	25.506 V
4000.00	92.11	2.87	896.62	2983.86	714.19	497805.64	1698588.46	39 51	42.501 N	80 34	25.443 V
4100.00	9 1.58	3.05	894.81	3083.73	718.84		1698593.11	39 51	43,489 N	80 34	25.399 V
4132.00	92.78	3.44	893.59	3115.65	720.65	497937.43	1698594.92	39 51	43.805 N	80 34	25.380 V
Fargets											
New-		Description	7100			Map	Map		titude>		igitude —
Name		Description	TVD ft	+N/-S ft	+E/-W ft	Northing ft	g Easting ft	Deg Mi	D 260	Deg Mi	0 3 60
Interce	pt TD de (Radius	· 1\	917.00	330.10	275.62	495151.8	8 1698149.89	39 51	16.224 N	80 34	30.660 W
West C	Center TD		917.00	3121.91	718.95	497943.5	91698593.22	39 51	43.866 N	80 34	25.403 W

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VAY Department of Environmental Protoction



Office of Oil and Gas

SEP 2 5 2017

Vin Devalument of tion

Scientific Drilling Survey Report



VP/Depertment of

Field: Site: Well: /	MARSHALL MC 57 WEL ACCESS MI	ompany, LLC COUNTY, W L LOCATION C-57	V			Date: 5/8/2008 Co-ordinate(NE) Vertical (TVD) R Section (VS) Refe	Reference Reference erence:	te: Wi : GL Wi	L 1343.14 + 8 ell (0.00N,0.00	DE,62.48Azi)	h
Wellpath:	EAST LEG					Survey Calculation	on Metho	od: Mi	nimum Curval	ture Db:	Sybase
Field:		L COUNTY, V Vest Virginia a		vania Operat	ions						
Geo Datum	n:US State F : NAD27 (C Mean Sea	Plane Coordina Iarke 1866) Level	ate System	1927		Map Zone: Coordinate S Geomagnetic			l Virginia, Nort Centre 305	Ihem Zone	
Site:	MC 57 WE	LL LOCATIO	N								
C	Marshall C	0., WV	Nonthia		1 70 B	Lotitudes		39 51	12.929 N		
Site Position From:	a: Map		Northic Easting	•	21.78 ft 74.27 ft				34.143 W		
Position Un	certainty:	0.00	ft Č			North Refere			Grid		
Ground Lev	vel:	1343.14	<u>î</u>			Grid Conver	gence:		-0.69 deg		
Well:	ACCESS	MC-57				Slot Name:					
Well Positia	+E	/-S 0.00 /-W 0.00 0.00	ft Easting		21.78 fl 74.27 fl				12.929 N 34.143 W		
Position Un Wellpath:			n			Drilled From		WES	T LEG		
•		-		11.1.4.4.4.96		Tie-on Depth	1:	1	321.00 ft		
Current Da Magnetic Da		1343.14 + 8 4/25/2008		Height 138	51. 14 II	Above Syster Declination:	n Dsiam	: wear	n Sea Level -8.48 deg		
Field Streng		53292	۵T			Mag Dip Ang	gle:		67.82 deg		
Vertical Sec		th From (TVD)	+N/-S		+E/-W	-	Direc			
		<u>ft</u>		<u>fl</u>		<u>ft</u>		deg			
		0.00		0.00		0.00		62.48			
Survey Pro	gram for Def			0.00		0.00		62.48			
Date: 5/6	<i>/</i> 2008	finitive Wellpa Validated:		0.00		Version: 0			· · · · · · · · · ·		
Survey Prog Date: 5/6 Actual From ft	<i>/</i> 2008	finitive Wellpa		0.00				62.48 Teol Nem	· · · · · · · · · ·		
Date: 5/6 Actual From	Й2008 m То	linitive Wellpa Validated:	No (0)	0.00		Version: 0		Teol Nem	· · · · · · · · · ·		
Date: 5/6 Actual From ft 50.00	Ž2008 π To ft 646.00	finitive Wellpa Validated: Survey Survey #1	No (0)	0.00		Version: 0 Toolcode	5	Teol Nem Drop Gyr(e	atic	
Date: 5/6 Actual From ft 50.00 646.00 1321.00 Survey	72008 m To ft 646.00 1321.00 3765.00	initive Wellpa Validated: Survey Survey #1 Survey #2 Survey #1	No (0) (0)			Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS	;	Tool Nem Drop Gyrc Scientific	e o Systematic MWD System		
Date: 5/6 Actual From ft 50.00 646.00 1321.00	72008 π To ft 646.00 1321.00	finitive Wellpa Validated: Survey Survey #1 Survey #2	No (0)	+N/-S ft	+E/-W ft	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS Y VS ft	DLS deg/100	Teol Nem Drop Gyro Scientific Build fit deg/10	e o Systematic MWD System Turn Oft deg/100ft	Tool/Comment	
Date: 5/6 Actual From ft 50.00 646.00 1321.00 Survey MD ft 0.00	72008 π To ft 646.00 1321.00 3765.00 Iscl deg 0.48	initive Wellpa Validated: Survey Survey #1 Survey #2 Survey #4 Azim deg 226.20	No (0) (0) TVD ft 0.00	+N/-S ft 0.00	ft 0.00	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS VVS R 0.00	DLS deg/100 0.00	Tool Nem Drop Gyrc Scientific Build fit deg/10 0.00	e o Systematic MWD System Tura Oft deg/100ft 0.00	Tool/Comment	
Date: 5/6 Actual From ft 50.00 646.00 1321.00 Survey MD ft 0.00 100.00	72008 m To ft 646.00 1321.00 3765.00 Iacl deg 0.48 0.17	initive Wellpa Validated: Survey Survey #1 Survey #2 Survey #1 Azim deg 226.20 274.10	No (0) (0) TVD ft 0.00 100.00	+N/-S ft 0.00 -0.22	ft 0.00 -0.32	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS r t t 0.00 -0.38	DLS deg/100	Teol Nem Drop Gyro Scientific Build fit deg/10	e o Systematic MWD System Turn Oft deg/100ft	Tool/Comment TIE LINE Drop Gyro-SY:	 S
Date: 5/6 Actual From ft 50.00 646.00 1321.00 Survey MD ft 100.00 200.00 300.00	72008 m To ft 646.00 1321.00 3765.00 Incl deg 0.48 0.17 0.23 0.42	Azim deg 226.20 274.10 200.30 151.50	No (0) (0) TVD ft 0.00 100.00 200.00 300.00	+N/-S ft 0.00 -0.22 -0.36 -0.89	ft 0.00 -0.32 -0.55 -0.43	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS R 0.00 -0.38 -0.65 -0.79	DLS deg/100 0.00 0.39 0.24 0.32	Tool Nam Drop Gyro Scientific Build ft deg/10 0.00 -0.31 0.08 0.19	e D Systematic MWD System Turn Oft deg/100ft 0.00 47.90 -73.80 -48.80	Tool/Comment Tile LiNE Drop Gyro-SY: Drop Gyro-SY Drop Gyro-SY	S S S
Date: 5/6 Actual From ft 50.00 646.00 1321.00 Survey MD ft 0.00 100.00 200.00	72008 m To ft 646.00 1321.00 3765.00 Iscl deg 0.48 0.17 0.23	initive Wellpa Validated: Survey Survey #1 Survey #2 Survey #1 Azim deg 226.20 274.10 200.30	No (0) (0) TVD ft 0.00 100.00 200.00	+N/-S ft 0.00 -0.22 -0.36	ft 0.00 -0.32 -0.55	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS R 0.00 -0.38 -0.65 -0.79	DLS deg/100 0.00 0.39 0.24	Tool Nem Drop Gyra Scientific Build fit deg/10 0.00 -0.31 0.08	e D Systematic MWD System Oft deg/100ft 0.00 47.90 -73.80	Tool/Comment TIE LINE Drop Gyro-SY Drop Gyro-SY	S S S
Date: 5/6 Actual From ft 50.00 646.00 1321.00 Survey MD ft 100.00 200.00 300.00	72008 m To ft 646.00 1321.00 3765.00 Incl deg 0.48 0.17 0.23 0.42	Azim deg 226.20 274.10 200.30 151.50	No (0) (0) TVD ft 0.00 100.00 200.00 300.00 399.99 499.99	+N/-S ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS 7 VS ft 0.00 -0.38 -0.65 -0.79 -0.89 -0.81	DLS deg/100 0.00 0.39 0.24 0.32 0.16 0.34	Tool Nam Drop Gyrc Scientific Build fit deg/10 0.00 -0.31 0.08 0.19 -0.10 0.16	e D Systematic MWD System Oft deg/100ft 0.00 47.90 -73.80 -48.80 18.80 -44.20	Teol/Comment TIE LINE Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY	S S S S S
Date: 5/6 Actual From ft 50.00 646.00 1321.00 Survey MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00	72008 To ft 646.00 1321.00 3765.00 Iscl deg 0.48 0.17 0.23 0.48 0.17 0.23 0.42 0.32 0.48 0.34	initive Wellpa Validated: Survey #1 Survey #2 Survey #2 Survey #1 Azim deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00	No (0) (0) TVD ft 0.00 100.00 200.00 300.00 399.99 499.99 599.99	+N/-S ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15 0.71	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS r vS ft 0.00 -0.38 -0.65 -0.79 -0.89 -0.81 -0.52	DLS deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17	Tool Nem Drop Gyro Scientific Build fit deg/10 0.00 -0.31 0.08 0.19 -0.10 0.16 -0.14	e D Systematic MWD System Oft deg/100ft 0.00 47.90 -73.80 -48.80 18.80 18.80 18.80 13.90	Tool/Comment TIE LINE Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY	S S S S S
Date: 5/6 Actual From ft 50.00 646.00 1321.00 500.00 ft 100.00 200.00 300.00 400.00 500.00 600.00 700.00	72008 m To ft 646.00 1321.00 3765.00 Iscl deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.34 0.64	initive Wellpa Validated: Survey #1 Survey #2 Survey #2 Survey #1 Azim deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50	No (0) (0) TVD ft 0.00 100.00 200.00 300.00 399.99 499.99 599.99 699.99	+N/-S ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15 0.71 0.71	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS R 0.00 -0.38 -0.65 -0.79 -0.89 -0.81 -0.52 -0.91	DLS deg/100 0.00 0.24 0.32 0.16 0.34 0.17 0.37	Tool Nem Drop Gyro Scientific Build fit deg/10 0.00 -0.31 0.06 0.19 -0.10 0.16 -0.14 0.30	e D Systematic MWD System Turn Oft deg/100ft 0.00 47.90 -73.80 -48.80 18.80 18.80 -44.20 13.90 26.50	Teol/Comment TIE LINE Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY	S S S S S
Date: 5/6 Actual From ft 50.00 646.00 1321.00 Survey MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00	72008 To ft 646.00 1321.00 3765.00 Incl deg 0.48 0.48 0.47 0.23 0.42 0.32 0.48 0.34 0.34 0.64 27.74	Azim 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36	No (0) (0) TVD ft 100.00 200.00 300.00 399.99 499.99 599.99 699.99 699.99 797.25	+N/-S ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15 0.71	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS r vs f f 0.00 -0.38 -0.65 -0.79 -0.89 -0.81 -0.52 -0.91 14.67	DLS deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17	Tool Nem Drop Gyro Scientific Build fit deg/10 0.00 -0.31 0.08 0.19 -0.10 0.16 -0.14	e D Systematic MWD System Oft deg/100ft 0.00 47.90 -73.80 -48.80 18.80 18.80 18.80 13.90	Teol/Comment TIE LINE Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY	S S S S S
Date: 5/6 Actual From ft 50.00 646.00 1321.00 Survey MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00	72008 m To ft 646.00 1321.00 3765.00 Iocl deg 0.48 0.17 0.23 0.42 0.32 0.42 0.32 0.42 0.32 0.44 0.34 0.54 0.54 10,05 10,	Azim deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60	No (0) (0) TVD ft 0.00 100.00 200.00 300.00 399.99 499.99 599.99 699.99 699.99 699.99 699.99 699.99 699.99 699.99 699.99	+N/-S ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96	ft 0.000 -0.32 -0.55 -0.43 -0.19 0.15 0.71 0.71 11.24 54.04	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS 7 VS ft 0.00 -0.38 -0.65 -0.79 -0.89 -0.89 -0.81 -0.52 -0.91 14.67 78.40	DLS deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50	Tool Nam Drop Gyro Scientific Scientific 0.00 -0.31 0.08 0.19 -0.10 0.16 -0.14 0.30 27.09 31.38	e D Systematic MWD System Oft deg/100ft 0.00 47.90 -73.80 -48.80 18.80 18.80 -44.20 13.90 26.50 -131.14 4.24	Teol/Comment TIE LINE Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY Drop Gyro-SY	S S S S S
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Date: 5/6 Actual From ft 50.00 646.00 1321.00 Survey MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.60 800.00 900.00 1000.00 1100.00 1200.00 1300.00 1300.00 1300.00	72008 To ft 646.00 1321.00 3765.00 Iscl deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34 89.19 90.65 92.85 91.35	Azim deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46 40.17 47.87 53.02 56.20	No (0) (0) (0) TVD ft 0.00 100.00 200.00 300.00 399.99 599.99 599.99 599.99 599.99 599.99 599.99 599.99 599.99 599.99 599.99 599.99 599.99 599.50 866.49 804.82 916.13 918.78 918.56	+N/-S ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 137.36 213.75 291.42 367.37	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15 0.71 0.71 11.24 54.04 112.19 175.48 238.40 303.44	Version: 0 Toolcode Drop Gyro-SYS MWD-SDI-SYS 7 VS ft 0.00 -0.38 -0.65 -0.79 -0.89 -0.81 -0.52 -0.91 14.67 78.40 162.96 254.39 346.08 438.85 533.21	DLS deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.37 28.17 31.50 16.48 10.75 2.88 1.62	Tool Nam Drop Gyro Scientific Scientific 0.00 -0.31 0.08 0.19 -0.10 0.16 -0.14 0.30 27.09 31.38 16.47 10.75 2.85 1.46	e D Systematic MWD System Oft deg/100ft 0.00 47.90 -73.80 -48.80 18.80 18.80 -44.20 13.90 26.50 -131.14 4.24 -0.61 0.05 0.42 0.71	Tool/Comment TIE LINE Drop Gyro-SY: Drop Gyro-SY: Drop Gyro-SY: Drop Gyro-SY: Drop Gyro-SY: Drop Gyro-SY:	S S S S S S S S S S
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Scientific Drilling Survey Report

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Company: Field: Site: Well: Wellpath:	MARSHA		W		Vei Sec	ordinate(NI rtical (TVD) tion (VS) Re	E) Reference: Reference:	GL 1 Well	0:41:48 : ACCESS I 343.14 + 8 (0.00N,0.00 mum Curvat	1351.1)E,62.4	BAzi)	: 2 h Sybase
Survey												
MD	Incl	Azim	TVD	+N/-S	+E/-W	VS		Build	Turn	Tool	Comment	
ft	deg	deg	ft	ft	ft	fi	deg/100ft d	jeg/100fl	deg/100ft			
2100.00	88.50	64.19	911.15	799.40	969.22	1228.92	2.70	-2.64	0.58	MWD	-SDI-SYS	3
2200.00	92.34	62.88	911.31	844.46	1058.45	1328.87	4.06	3.85	-1.31		-SDI-SYS	
2300.00	90.77	60.55	908.82	891.54	1146.62	1428.82		-1.57	-2.33	MWD	-SDI-SYS	3
2400.00	89.65	61.37	907.45	940.55	1233.78	1528.76	1.38	-1.12	0.82	MWD	-SDI-SYS	5
2500.00	88.36	62.84	910.82	987.11	1322.21	1628.70	1.96	-1.29	1.47	MM	-SDI-SYS	2
2600.00	91.19	62.68	912.23	1032.55	1411.26	1728.67	2.83	2.83	-0.16		SDISTS	
2700.00	92.02	60.04	908.93	1079.86	1499.29	1828.60	2.77	0.84	-2.64		-SDI-SYS	
2800.00	89.50	58.48	906.80	1131.50	1584.88	1928.37		-2.52	-1.55		-SDI-SYS	
2900.00	89.98	60.55	906.44	1184.04	1669.94	2028.09	2.12	0.48	2.06		-SDI-SYS	
3000.00	89.19	61.55	909.73	1232.36	1757.42	2127.99	1.27	-0.79	1.00	MM	-SDI-SYS	
3100.00	91.28	60.70	907.37	1279.47	1845.59	2227.95	2.25	2.08	-0.85		-SDI-SYS	
3200.00	87.83	59.90	907.07	1329.65	1932.06	2327.82	3.54	-3.45	-0.80		-SDI-SYS	
3300.00	93.10	63.03	906.80	1378.42	2019.27	2427.70	6.13	5.27	3.13		-SDI-SYS	
3400.00	89.51	64.13	903.55	1422.33	2109.03	2527.59		-3.59	1.11		-SDI-SYS	
3500.00	88.40	65.26	907.18	1464.91	2199.43	2627.44	1.58	-1.11	1.13	MWD	-SDI-SYS	:
3600.00	92.50	68.33	904.25	1504.23		2727.06	5.12	4.09	3.07		-SDI-SYS	
3700.00	89.88	68.56	902.30	1541.22		2826.51		-2.62	0.22		-SDI-SYS	
3765.00	86.32	70.00	904.46	1564.12	2444.93	2891.00		-5.47	2.22		-SDI-SYS	
Targets												
Name		Description	TVD ft	+N/-S fi	+E/-W	Mar / North ft			- Latitude eg Min Se		← Lon Deg Mit	gitude —> 1 Sec
Interce	pt TD de (Radius	e: 1)	917.00	330.10) 275.62	49515	1.88 1698149	.89 3	9 51 16.22	4 N	80 34 3	30.660 W
East Lo		•	917.00	1585.50) 2435.23	496407	7.281700309	.50 3	9 51 28.88	15 N	80 34	3.161 W

RECEIVED Office of Oil and Gas

SEP 2 5 2017

VM Decentration of Environmental Protoction

Scientific Drilling Survey Report - Geographic



NAY Depertment of

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Field: Site:	MARSHALI MC 57 WE ACCESS N	Company, LLC L COUNTY, 1 LL LOCATIO 1C-57	N V				Co Ve Se	ate: 5/8/2008 p-ordinate(NE) ertical (TVD) R ection (VS) Refe urvey Calculatio	Reference: leference: erence:	Wa GL Wa	. 1343. ⁻ 38 (0.00	34 ESS MC 14 + 8 13 N,0.00E, Curvature	51.1 62.48Az	i)		1 se
Field:		LL COUNTY West Virginia		noculuza	ia Oper	tions	1									
	U.S.A. n:US State ; NAD27 (0	Plane Coordi Clarke 1866)		•	•	110115		Map Zone: Coordinate S		Well	Centre	a, Norther	m Zone			
								Geomagnetic	MIGGEI:	igrf20						
Site:		ELL LOCATI	ON													
Site Position	Marshall (n:	Co., WV	N	forthing:	4948	21.78	ft	Latitude:	39	51	12.929	N				
From: Position Un	Map	0.00		asting:	16978	74.27	fl	Longitude: North Refere		34	34.143 Grid	W				
Ground Lev		1343.14						Grid Converg			-0.69	deg				
Weil:	ACCESS	MC-57						Slot Name:								
Well Positio)n: +N	v-s 0.00) ft N	orthing:	4948	21.78	fl	Latitude:	39	51	12.929	N				
Position Un	_	24-W 0.00 0.00		asting :	16978	74.27	fl	Longitude:	80	34	34.143	W				
Wellpath:	EASTLE							Drilled From:	:	WES	TLEG				•	
•				••		E1 44	A	Tie-on Depth:	:	1	321.00					
Current Dat Magnetic Da		1343.14 + 8 4/25/2008		н	eight 13	31.14	ц	Above System Declination:		меап	Sea Le -8.48					
Field Streng		53292			+N/-S			Mag Dip Ang	le:	D:	67.82	deg				
Vertical Sec	The	ath Farmer (The						+E/•W		Direc	100				•	
	tion: Dej	nth From (TV ft	<i></i> ,		-11/-3 ft			ft		deg						
	•	ft 0.00						ft 0.00		deg 62.48						
Survey Prog Date: 5/6/	gram for De /2008	ft	atb		ft											
Survey Prog Date: 5/6/ Actual From ft 50.00 646.00	gram for De /2008 n To ft 646.00 1321.00	ft 0.00 Unitive Wellp Validated Survey Survey # Survey #	atb : No 1 (0) 2 (0)		ft		Т(0.00 ersion: 0 oolcode rop Gyro-SYS	Too	62.48 I Name D Gyro	System					
Survey Prog Date: 5/6/ Actual From ft 50.00 646.00 1321.00	gram for De /2008 n To ft 646.00	ft 0.00 finitive Wellp Validated Survey Survey #	atb : No 1 (0) 2 (0)		ft		Т(0.00 ersion: 0 oolcode	Too	62.48 I Name D Gyro	System	natic ystematic				
Survey Prog Date: 5/6/ Actual From ft 50.00 646.00 1321.00	gram for De /2008 n To ft 646.00 1321.00	ft 0.00 Unitive Wellp Validated Survey Survey # Survey #	atb : No 1 (0) 2 (0)		ft		T D M	0.00 ersion: 0 oolcode rop Gyro-SYS WD-SDI-SYS Map	Too	62.48 I Name o Gyro entific N	Systen AWD S		> <_		gitude	
Survey Prog Date: 5/6/ Actual From ft 50.00 646.00 1321.00	gram for De /2008 n To ft 646.00 1321.00	ft 0.00 Unitive Wellp Validated Survey Survey # Survey #	atb : No 1 (0) 2 (0)		ft	+E/- fi	T D M W	0.00 ersion: 0 oolcode rop Gyro-SYS WD-SDI-SYS	Tool Droj Scie	62.48 I Name D Gyro entific M	Systen AWD S	ystematic	> <_		gitude Sec	
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Survey Prog Date: 5/6/ Actual From ft 50.00 646.00 1321.00 Survey MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 500.00 600.00 900.00 1000.00 1000.00 1000.00 1300.00 1300.00 1500.00 1600.00	ram for De 72008 n To ft 646.00 1321.00 3765.00 Incl deg 0.48 0.17 0.23 0.42 0.32 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34 89.19 90.65 92.85 91.35 91.65	ft 0.00 Galitive Wellp Validated Survey # Survey # Survey # Azim deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46 40.17 47.87 53.02 56.20	1 (0) 2 (0) 1 (0) 2 (0) 1 TVI ft 0.0 100.0 200.0 300.0 309.9 499.9 599.9 699.9 699.9 699.9 699.9 699.9 699.9 591.9 699.9 591.9 691.9 10.0	100 100 100 199 199 199 199 199 199 102 113 132 132 144 143 133 151 199 56	ft 0.00 0.00 0.22 0.36 -0.28 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 55.96 37.36 13.75 91.42 65.96 37.36 13.75 91.42 65.96 04.48 62.87	fi 0.0 -0.3 -0.4 -0.4 -0.4 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	Ti Di M W W 2000 355 555 133 19 155 71 24 24 29 188 400 44 77 23 39	0.00 ersion: 0 oolcode rop Gyro-SYS WD-SDI-SYS WD-SDI-SYS WD-SDI-SYS 494821.78 494821.78 494820.89 494820.89 494820.89 494820.22 494819.75 494819.75 494819.75 494819.30 494819.44 494831.94 494831.94 494887.74 494959.14 495035.53 495113.20 495189.15 495261.64 495326.26 495326.26 495326.26	Tool Drog Scie Map Easting ft 1697874.22 1697873.94 1697873.94 1697874.92 1697874.92 1697874.92 1697874.92 1697874.93 1697874.93 1697874.94 1697885.51 1697986.46 1698049.77 1698112.67 1698112.67 1698112.67 1698112.67 1698122.50 1698403.66	62.48	System AWD S 	ystematic itude	> < Deg N 80 N 80 N 80 N 80 N 80 N 80 N 80 N 80	Min 34 34 34 34 34 34 34 34 34 34 34 34 34	Sec 34.14 34.14 34.14 34.14 34.14 34.14 34.14 34.14 34.13 34.10 33.46 32.72 31.92 31.13 30.30 29.44 28.47 27.44	370VV 370VV 370VV 370VV 370VV 55 130VV 561VV 80 80 80 80 80 80 80 80 80 80 80 80 80
Survey Prog Date: 5/6/ Actual From ft 50.00 646.00 1321.00 Survey MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1000.00 1000.00 1000.00 1000.00 1300.00 1400.00 1500.00 1500.00 1700.00	gram for De 72008 n To ft 646.00 1321.00 3765.00 Incl deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.34 0.34 0.64 27.74 59.11 75.58 86.34 89.19 90.65 92.85 91.35 91.65 87.95	ft 0.00 Ualidated Survey Survey Survey Survey Survey Survey Survey Azim deg 226.20 274.10 200.30 151.50 170.30 125.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46 40.17 47.87 53.02 56.20 58.22	atb : No 1 (0) 2 (0) 1 TVI ft 0.0 100.0 200.0 300.0 300.0 309.9 499.9 599.9 699.9 699.9 699.9 699.9 599.9 699.9 599.9 699.9 599.9 699.9 599.9 699.9 599.5 915.5 912.8 911.0 910.0	100 100 100 199 199 199 199 199 199 199	ft 0.00 N/-S ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 55.96 37.36 13.75 91.42 57.37 39.86 04.48 52.87 16.15	fi 0.0 -0.3 -0.4 -0.	Ti Di M W 2000 32 55 55 13 19 15 71 71 24 9 18 8 40 44 77 23 9 86	0.00 ersion: 0 oolcode rop Gyro-SYS WD-SDI-SYS WD-SDI-SYS WD-SDI-SYS 494821.78 494821.78 494821.78 494821.78 494820.89 494820.89 494820.89 494820.89 494820.89 494820.89 494820.89 494820.89 494820.53 494819.30 494819.30 494819.30 494819.30 494819.30 494819.30 495355.53 49513.20 495389.15 495261.64 495326.26 495384.65 495384.65 495437.93	Tool Drog Scie Map Easting ft 1697874.22 1697873.39 1697873.39 1697873.39 1697873.39 1697874.92 1697874.92 1697874.92 1697874.92 1697874.92 1697874.93 1697985.42 1697985.42 1698122.50 1698177.71 1698246.34 1698322.50 1698403.66 1698408.23	62.48 D Gyro o Gyro o Gyro D D 7 3 3 3 3 3 3 3 3 3 3 3 3 3	System AWD S Lat rg Min 19 51 19 51 10	ystematic itude	> < Deg N 80 N 80 N 80 N 80 N 80 N 80 N 80 N 80	Min 34 34 34 34 34 34 34 34 34 34 34 34 34	Sec 34.14 34.14 34.14 34.14 34.14 34.14 34.14 34.14 34.13 34.00 33.46 32.72 31.92 31.13 30.30 29.44 28.47 27.44 26.36	37085 13300 66190 325
Survey Prog Date: 5/6/ Actual From ft 50.00 646.00 1321.00 Survey MD ft 0.00 100.00 200.00 300.00 300.00 500.00 600.00 500.00 600.00 500.00 1000.00 1000.00 1100.00 1300.00 1400.00 1500.00	ram for De 72008 n To ft 646.00 1321.00 3765.00 Incl deg 0.48 0.17 0.23 0.42 0.32 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34 89.19 90.65 92.85 91.35 91.65	ft 0.00 Galitive Wellp Validated Survey # Survey # Survey # Azim deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46 40.17 47.87 53.02 56.20	1 (0) 2 (0) 1 (0) 2 (0) 1 TVI ft 0.0 100.0 200.0 300.0 309.9 499.9 599.9 699.9 699.9 699.9 699.9 699.9 699.9 591.9 699.9 591.9 691.9 10.0	100 100 100 199 199 199 199 199 199 199	ft 0.00 0.00 0.22 0.36 -0.28 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 55.96 37.36 13.75 91.42 67.37 39.86 04.48 52.87	fi 0.0 -0.3 -0.4 -0.4 -0.4 0.7 0.7 0.7 0.7 0.7 0.7 0.7 0.7	T D M W 32555 43 99 15571 71 71 71 19 88 80 44 93 86 01	0.00 ersion: 0 oolcode rop Gyro-SYS WD-SDI-SYS WD-SDI-SYS WD-SDI-SYS 494821.78 494821.78 494821.78 494821.78 494821.78 494821.42 494820.22 494820.22 494819.75 494820.22 494819.75 494819.30 494819.44 494887.74 494959.14 495035.53 495113.20 495113.20 495113.20 495138.15 495261.64 495326.26 495384.65 495384.65	Tool Drog Scie Map Easting ft 1697874.22 1697873.94 1697873.94 1697874.92 1697874.92 1697874.92 1697874.92 1697874.93 1697874.93 1697874.94 1697885.51 1697986.46 1698049.77 1698112.67 1698112.67 1698112.67 1698112.67 1698122.50 1698403.66	62.48 1 Name D Gyro 0 Gyro 0 Gyro 0 Gyro 0 Gyro 0 Gyro 1 3 3 3 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 1 3 3 3 3 3 3 3 3 1	System AWD S 	ystematic itude	> < Deg N 80 N 80 N 80 N 80 N 80 N 80 N 80 N 80	Min 34 34 34 34 34 34 34 34 34 34 34 34 34	Sec 34.14 34.14 34.14 34.14 34.14 34.14 34.14 34.14 34.13 34.10 33.46 32.72 31.92 31.13 30.30 29.44 28.47 27.44	37085 13300 66190 3257 VVVV VVVV VVVVVVVVVVVVVVVVVVVVVVVVVVV

Scientific Drilling Survey Report - Geographic

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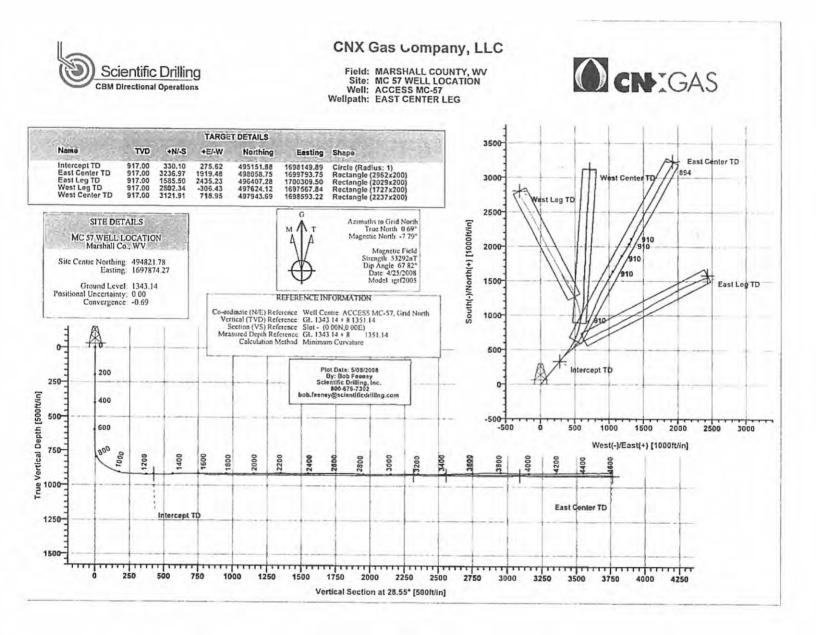
Company: Field: Site: Well: Well: Wellpath:	MARSHAL		w	·		Date: 5/8/200 Co-ordinate(NE) Vertical (TVD) F Section (VS) Ref	Reference: Reference: erence:	ne: 10:45:34 Well: ACCESS MC GL 1343.14 + 8 13 Well (0.00N,0.00E,	51.1 62.48Azi)
Survey	EAST LEG	, 		* *		Survey Calculati	on Method:	Minimum Curvatun	Db: Sybase
MD ft	Inci deg	Azim deg	TVD ft	+N/-S ft	+E/-W ft	Map Northing fl	Map Easting ft	< Latitude Deg Min Sec	> < Longitude Deg Min Sec
2000.00	91.13	63.62	910.39	755.88	879.21	495577.66	1698753.48	39 51 20.503	N 80 34 22.986
2100.00	88.50	64.19	911.15	79 9 .40	969.22	495621.18	1698843.49	39 51 20.943	
2200.00	92.34	62.88	911.31	844.46	1058.45	495666.24	1698932.72	39 51 21.399	N 80 34 20.701
2300.00	90.77	60.55	908.82	891.54	1146.62		1699020.89	39 51 21.875	
2400.00	89.65	61.37	907.45	940.55	1233.78	495762.33	1699108.05	39 51 22.370	N 80 34 18.468
2500.00	88.36	62.84	910.82	987.11	1322.21	495808.89	1699196.48	39 51 22.840	N 80 34 17,341
2600.00	91.19	62.68	912.23	1032.55	1411.28	495854.33	1699285.53	39 51 23.300	
2700.00	92.02	60.04	908.93	1079.86	1499.29	495901.64	1699373.56	39 51 23.778	
2800.00	89.50	58.48	906.80	1131.50	1584.88	495953.28	1699459.15	39 51 24.298	
2900.00	89.98	60.55	906.44	1184.04	1669.94	496005.82	1699544.21	39 51 24.827	
3000.00	89.19	61.55	909.73	1232.36	1757.42	496054.14	1699631.69	39 51 25.315	N 80 34 11.798
3100.00	91.28	60.70	907.37	1279.47	1845.59	496101.25	1699719.86	39 51 25.791	
3200.00	87.83	59.90	907.07	1329.65	1932.06	496151.43	1699806.33	39 51 26.297	
3300.00	93.10	63.03	906.80	1378.42	2019.27	496200.20	1699893.54	39 51 26.789	
3400.00	89.51	64.13	903.55	1422.33	2109.03	496244.11	1699983.30	39 51 27.234	
3500.00	88.40	65.26	907.18	1464.91	2199.43	496286.69	1700073.70	39 51 27.665	N 80 34 6.166 V
3600.00	92.50	68.33	S04.25	1504.23	2291.27	496326.01	1700165.54	39 51 28.065	
3700.00	89.88	68.56	902.30	1541.22	2384.15	496363.00	1700258.42	39 51 28.441	
3765.00	86.32	70.00	904.46	1564.12	2444.93	496385.90	1700319.20	39 51 28.675	
Targets								······	
Name		Decemination	73/7			Map	Мар	< Latitude	-> < Longitude

Name	Description	TVD ft	+N/-S ft	+E/-W îl	Map Northing ft	Map Easting ft	< Latitude> Deg Min Sec	- Longitude -> Deg Min Sec
Intercept TD -Circle (Ra		917.00	330.10	275.62	495151.881	698149.89	39 51 16.224 N	80 34 30.660 W
East Leg TD		917.00	1585.50	2435.23	496407.281	1700309.50	39 51 28.885 N	80 34 3.161 W

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Scientific Drilling Survey Report

SEP 2 5 2017

V.M Der artment of Environmenter Protection

Site: Well: Wellpath:	MARSHAL		w				Verti Sectio	: 5/8/20 rdinate(NI ical (TVD) on (VS) Re ey Calcula	E) Referen Reference eference:	ice: c:	GL 1343.14	ESS MC-57, Gr 4 + 8 1351.1 4,0.00E,28.55A	zi)	
Field:		LL COUNTY West Virginia		Pennsylva	inia Ope	erations				÷				
Geo Datur	m:US State	Plane Coordi Clarke 1866) a Level	inate §	System 19	127		С	Map Zone: Coordinate Geomagnet	System:	v	Vest Virginia, Vell Centre Inf2005	Northern Zone	1	
Site:	MC 57 W	ELL LOCATI	ON											
Site Positio From: Position U: Ground La	Map acertainty:	Co., WV 0.00 1343.14) ft	Northing: Easting:		4821.78 7874.27	ft L N	atitude: .ongitude: lorth Refer Grid Conve	rence:	39 5 80 3-		Ň		
Well:	ACCESS	MC-57					S	lot Name:						
Well Positi Position U	+E	U-S 0.00 U-W 0.00 0.00) ft	Northing: Easting :		4821.78 7874.27		atitude: .ozgitude:		39 5 ⁻ 80 34				
Wellpath: Current Di Magnetic I Field Stren Vertical Se	atum: GL Data: ligth:	NTER LEG - 1343.14 + 8 4/25/2008 53292 oth From (TV) ft	l I nT	E	Jeight +N/-: fl	1351.14 (S	Ti ft Al Di M +t	Prilled From ie-on Dept bove Syste Peclination; 12g Dip An E/-W fl	th: :m Datum :	: M Di	AST LEG 1479.00 f ean Sea Lev -8.48 c 67.82 c irection eg	iel leg		
		0.00			0.00		0.	0.00		28.	55			
Date: 5/8 Actual From ft	8/2008 m To ft	finitive Wellp Validated Survey	: No				Versi Toolc			Tool N	Ribc			With Constant
50.00 646.00 1321.00 1479.00	648.00 1321.00 1479.00 4610.00	Survey #1 Survey #2 Survey #1 Survey #1	2 (0) 1 (3)				MWD	Gyro-SYS D-SDI-SYS D-SDI-SYS	6	Scienti	yro Systema fic MWD Sys fic MWD Sys	tematic		
Survey	inel	Azim	 TU		NIC	+ E/ M		Ne						
MD ft	Incl deg	Azim deg	TV ft		+N/-S ft	+ E/- V ft		VS ft	DLS deg/100	Buil ft deg/	d Tura 100ft deg/10	Tool/Con lOft	nment	
MD	deg 0.48	deg 226.20	ft 0.	.00	ft 0.00	ft 0.0(0	ft 0.00	deg/100 0.00	ft deg/ 0.0	100ft deg/10 0 0.00	TIE LINE		
MD ft 0.00 100.00 200.00	deg 0.48 0.17 0.23	deg	ft 0. 100. 200.	.00 .00 .00	ft	ft 0.00 -0.32	0	ft 0.00 -0.35	deg/100 0.00 0.39	ft deg/ 0.0 -0.3	100ft deg/10 0 0.00 1 47.90	TIE LINE Drop Gyr	TO-SYS	
MD ft 0.00 100.00 200.00 300.00	deg 0.48 0.17 0.23 0.42	deg 226.20 274.10 200.30 151.50	ft 0. 100. 200. 300.	.00 .00 .00 .00	ft -0.22 -0.36 -0.89	ft 0.00 -0.32 -0.55 -0.43	D 2 5 3	ft 0.00 -0.35 -0.57 -0.99	deg/100 0.00	ft deg/ 0.0	100ft deg/10 0 0.00 1 47.90 6 -73.80	TIE LINE Drop Gyr Drop Gyr	IO-SYS	
MD ft 0.00 100.00 200.00 300.00 400.00	deg 0.48 0.17 0.23 0.42 0.32	deg 226.20 274.10 200.30 151.50 170.30	ft 0. 100. 200.	.00 .00 .00 .00	ft -0.22 -0.36	ft 0.00 -0.32 -0.55	D 2 5 3	ft 0.00 -0.35 -0.57	deg/100 0.00 0.39 0.24	ft deg/ 0.0 -0.3 0.0	100ft deg/10 0 0.00 1 47.90 6 -73.80 9 -48.80	TIE LINE Drop Gyr	IO-SYS IO-SYS IO-SYS	
MD ft 0.00 100.00 200.00 300.00 400.00 500.00	deg 0.48 0.17 0.23 0.42 0.32 0.48	deg 226.20 274.10 200.30 151.50 170.30 126.10	ft 0. 100. 200. 300. 399. 499.	00 00 00 00 99 99	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15	D 2 5 3 9	ft 0.00 -0.35 -0.57 -0.99 -1.46 -1.71	deg/100 0.00 0.39 0.24 0.32	ft deg/ -0.3 0.0 0.1	100ft deg/10 0 0.00 11 47.90 6 -73.80 9 -48.80 0 18.80	Dift TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr	ID-SYS ID-SYS ID-SYS ID-SYS ID-SYS	
MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00	ft 0. 100. 200. 300. 399. 499. 599.	00 00 00 00 99 99 99	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15 0.71	0 2 5 3 9 5	ft 0.00 -0.35 -0.57 -0.99 -1.46 -1.71 -1.84	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17	ft deg/ -0.3 -0.3 0.0 0.1 -0.1 -0.1	100ft deg/10 0 0.00 11 47.90 66 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.80	TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr	TO-SYS TO-SYS TO-SYS TO-SYS TO-SYS	
MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.64	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50	ft 0. 200. 300. 399. 499. 599. 699.	00 00 00 00 99 99 99 99	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15 0.71 0.71	D 2 5 3 9 5 1	ft 0.00 -0.35 -0.57 -0.99 -1.46 -1.71 -1.84 -2.59	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37	ft deg/ 0.0 -0.3 0.0 0.1 -0.1 0.1 -0.1 0.3	100ft deg/10 0 0.00 11 47.90 6 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.90 0 26.50	Oft TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr	TO-SYS TO-SYS TO-SYS TO-SYS TO-SYS	
MD ft 0.00 200.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00	ft 0. 100. 200. 300. 399. 499. 599.	00 00 00 00 99 99 99 99 99 99 99 99 99 25	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48	ft 0.00 -0.32 -0.55 -0.43 -0.19 0.15 0.71	D 2 5 3 9 5 1 1	ft 0.00 -0.35 -0.57 -0.99 -1.46 -1.71 -1.84	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17	ft deg/ -0.3 -0.3 0.0 0.1 -0.1 -0.1	100ft deg/10 0 0.00 11 47.90 6 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.90 0 26.50 9 •131.14	Oft TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr	TO-SYS TO-SYS TO-SYS TO-SYS TO-SYS	
MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 600.00 800.00 900.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.64 27.74	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36	ft 0. 100. 200. 300. 399. 499. 599. 699. 797. 866.	00 00 00 99 99 99 99 99 99 99 99 99 99 9	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96	ft 0.00 -0.33 -0.55 -0.43 -0.15 0.71 0.71 11.24 54.04	D 2 5 3 9 5 1 1	ft 0.00 -0.35 -0.57 -0.99 -1.48 -1.71 -1.84 -2.59 14.30 83.77	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50	ft deg/ 0.0 -0.3 0.0 0.1 -0.1 -0.1 0.3 27.0 31.3	100R deg/10 0 0.00 1 47.90 6 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.90 0 26.50 9 •131.14 8 4.24	Oft TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr	TO-SYS TO-SYS TO-SYS TO-SYS TO-SYS	
MID ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04	ft 0. 100. 200. 300. 399. 499. 599. 699. 797. 866. 904. 916.	00 00 00 99 99 99 99 99 99 99 99 99 99 9	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 37.36 13.75	ft 0.00 -0.33 -0.55 -0.43 -0.15 0.15 0.15 0.71 0.71 11.24	0 2 5 5 3 9 9 5 1 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	ft 0.00 -0.35 -0.57 -0.99 -1.48 -1.71 -1.84 -2.59 14.30	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50 16.48	ft deg/ 0.0 -0.3 0.0 0.1 -0.1 0.1 -0.1 0.3 27.0 31.3 16.4	100ft deg/10 0 0.00 1 47.90 6 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.90 0 26.50 9 •131.14 8 4.24 7 -0.61	Oft TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr	TO-SYS TO-SYS TO-SYS TO-SYS TO-SYS	
MID 100.00 200.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 100.00 200.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34 89.19	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46	ft 0. 100. 200. 300. 399. 499. 599. 699. 599. 699. 866. 904. 916. 918.	00 00 00 99 99 99 99 99 99 99 99 99 99 9	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 37.36 13.75 91.42	ft 0.04 -0.37 -0.55 -0.43 -0.15 0.71 0.71 11.24 54.04 112.19 175.48 238.40) 22 55 33 99 1 4 4 4 4 4 4 4 4 4 4 4 1 3 2 2 0 31	ft 0.00 -0.35 -0.57 -0.99 -1.48 -1.71 -1.84 -2.59 14.30 83.77 74.28	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50	ft deg/ 0.0 -0.3 0.0 0.1 -0.1 -0.1 0.3 27.0 31.3	100ft deg/10 0 0,00 11 47,90 6 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.90 0 26.50 9 •131.14 8 4.24 7 -0.61 5 0.05	Oft TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr	TO-SYS TO-SYS TO-SYS TO-SYS TO-SYS	
MID ft 0.00 100.00 200.00 300.00 400.00 500.00 500.00 600.00 800.00 800.00 800.00 1000.00 1000.00 300.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04	ft 0. 100. 200. 300. 399. 499. 599. 599. 797. 866. 904. 916. 918. 918.	00 00 00 99 99 99 99 99 99 99 99 99 99 9	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 37.36 13.75	ft 0.00 -0.33 -0.55 -0.43 -0.15 0.71 0.71 11.24 54.04 112.19 175.48 238.40 303.44	D 22 55 5 1 1 4 4 1 3 22 0 3 4 4 4	ft 0.00 -0.35 -0.57 -0.99 -1.48 -1.71 -1.84 -2.59 14.30 83.77 74.28 71.63 869.92 67.72	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50 16.48 10.75 2.88 1.62	ft deg/ 0.0 -0.3 0.0 0.1 -0.1 0.1 -0.1 0.1 -0.1 0.3 27.0 31.3 16.4 10.7 2.8 1.4	100ft deg/10 0 0.00 14 47.90 6 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.80 0 26.50 9 •131.14 8 4.24 7 -0.61 5 0.05 5 0.42 6 0.71	KOR TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr	0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS	
MID ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 100.00 100.00 300.00 300.00 400.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34 89.19 90.65 92.85	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46 40.17 47.87	ft 0. 100. 200. 309. 399. 499. 599. 699. 797. 866. 904. 916. 918. 916.	00 00 00 99 99 99 99 99 99 99 99 99 99 9	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 37.36 13.75 91.42 67.37 39.86	ft 0.00 -0.37 -0.55 -0.43 -0.15 0.71 0.71 11.24 54.04 112.19 175.48 238.40 303.44 372.07	0 2 5 5 1 5 1 1 1 3 2 1 3 2 1 3 4 4 4 4 7 5 6	ft 0.00 -0.35 -0.57 -0.99 -1.48 -1.71 -1.84 -2.59 14.30 83.77 74.28 71.63 85.92 667.72 664.20	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50 16.48 10.75 2.88 1.62 8.00	ft deg/ 0.0 -0.3 0.0 0.1 -0.1 0.1 -0.1 0.1 27.0 31.3 16.4 10.7 2.8 1.4 2.2	100R deg/10 0 0.00 1 47.90 6 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.90 0 26.50 9 •131.14 8 4.24 7 -0.61 5 0.05 5 0.42 6 0.71 0 7.69	Koft TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr MWD-SD	10-SYS 10-SYS 10-SYS 10-SYS 10-SYS 10-SYS 10-SYS	
MID ft 0.00 200.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 100.00 100.00 1200.00 300.00 1400.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34 89.19 90.65 92.85 90.52	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46 40.17 47.87 48.57	ft 0. 100. 200. 300. 399. 499. 599. 699. 797. 866. 904. 916. 918. 916. 918. 916.	00 00 00 99 99 99 99 99 99 89 82 13 25 49 13 22 78 22 56 33 54 49 55 39 55	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 37.36 13.75 91.42 67.37 39.86 05.11	ft 0.00 -0.37 -0.55 -0.43 -0.15 0.71 0.71 11.24 54.04 112.19 175.48 238.40 303.44 372.07 447.72	0 2 5 3 3 3 3 4 4 4 4 7 5 6 2 6	ft 0.00 -0.35 -0.57 -0.99 -1.48 -1.71 -1.84 -2.59 14.30 83.77 74.28 271.63 869.92 167.72 164.20 57.67	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50 16.48 10.75 2.88 1.62 8.00 2.44	ft deg/ 0.0 -0.3 0.0 0.1 -0.1 0.1 -0.1 0.3 27.0 31.3 16.4 10.7 2.8 1.4 2.2 -2.3	100ft deg/10 0 0.00 11 47.90 6 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.90 0 26.50 9 •131.14 8 4.24 7 -0.61 5 0.05 5 0.42 6 0.71 0 7.69 3 0.70	KOR TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr MWD-SD MWD-SD	0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS	
MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34 89.19 90.65 92.85	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46 40.17 47.87 48.57 40.60	ft 0. 100. 200. 300. 399. 499. 599. 699. 797. 866. 916. 916. 916. 916. 916. 916. 912. 912.	00 00 00 99 99 99 99 99 99 99 99 99 99 9	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 37.36 13.75 91.42 67.37 39.86 05.11 77.06	ft 0.04 -0.37 -0.55 -0.43 -0.15 0.15 0.71 0.71 11.24 54.04 112.19 175.48 238.40 303.44 372.07 447.72 517.08	0 2 5 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 4 4 4 4	ft 0.00 -0.35 -0.57 -0.99 -1.48 -1.71 -1.84 -2.59 14.30 83.77 74.28 271.63 69.92 67.72 64.20 557.67 54.02	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50 16.48 10.75 2.88 1.62 8.00 2.44 7.98	ft deg/ 0.0 -0.3 0.0 0.1 -0.1 0.1 -0.1 0.3 27.0 31.3 16.4 10.7 2.8 1.4 2.2 -2.3 0.3	100ft deg/10 10 0.00 11 47.90 16 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.90 0 26.50 9 •131.14 8 4.24 7 -0.61 5 0.05 5 0.42 6 -7.19	KOR TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr MWD-SD MWD-SD	0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS	
MD ft 0.00 100.00 200.00 300.00 400.00 500.00 600.00 700.00 800.00 900.00 1000.00 1200.00 1300.00 1400.00	deg 0.48 0.17 0.23 0.42 0.32 0.48 0.34 0.64 27.74 59.11 75.58 86.34 89.19 90.65 92.85 90.52 90.88	deg 226.20 274.10 200.30 151.50 170.30 126.10 140.00 166.50 35.36 39.60 38.99 39.04 39.46 40.17 47.87 48.57	ft 0. 100. 200. 300. 399. 499. 599. 699. 797. 866. 904. 916. 918. 916. 918. 916.	00 00 00 99 99 99 99 99 99 99 99 99 99 9	ft 0.00 -0.22 -0.36 -0.89 -1.56 -2.03 -2.48 -3.34 10.16 65.96 37.36 13.75 91.42 67.37 39.86 05.11	ft 0.00 -0.37 -0.55 -0.43 -0.15 0.71 0.71 11.24 54.04 112.19 175.48 238.40 303.44 372.07 447.72	0 2 5 5 5 1 5 1 5 1 1 3 2 1 3 2 5 1 3 4 4 4 7 5 5 5 1 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5	ft 0.00 -0.35 -0.57 -0.99 -1.48 -1.71 -1.84 -2.59 14.30 83.77 74.28 271.63 869.92 167.72 164.20 57.67	deg/100 0.00 0.39 0.24 0.32 0.16 0.34 0.17 0.37 28.17 31.50 16.48 10.75 2.88 1.62 8.00 2.44	ft deg/ 0.0 -0.3 0.0 0.1 -0.1 0.1 -0.1 0.3 27.0 31.3 16.4 10.7 2.8 1.4 2.2 -2.3	100R deg/10 0 0.00 1 47.90 6 -73.80 9 -48.80 0 18.80 6 -44.20 4 13.90 0 26.50 9 -131.14 8 4.24 7 -0.61 5 0.42 6 0.71 0 7.69 3 0.70 6 -7.97 2 -9.09	KOR TIE LINE Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr Drop Gyr MWD-SD MWD-SD	0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS 0-SYS	

Scientific Drilling Survey Report

T CENTER LEG acl Azim eg deg 0.76 24.31 1.62 23.13 0.29 22.63 0.43 24.21 0.94 25.48 0.37 27.43 1.34 29.30 0.14 29.58 1.78 31.71 1.71 29.33 0.10 29.68	TVD ft 910.08 908.42 905.21 909.38 907.72 907.55 907.24 905.56 910.30 911.26	+N/-S ft 926.12 1017.43 1109.54 1201.39 1291.78 1381.36 1469.67 1556.44	+E/-W ft 709.40 750.11 788.89 828.17 870.88 915.29 962.20	urvey Calcula VS ft 1152.54 1252.21 1351.65 1451.10 1550.92 1650.83	DLS	Build deg/100f 0.47 0.87 -2.33 0.14 1.51	Turn Curvat Turn t deg/100ft -0.69 -1.18 -0.50 1.58 1.27	Tool/Comm MWD-SDI-5 MWD-SDI-5 MWD-SDI-5 MWD-SDI-5 MWD-SDI-5	SYS SYS SYS SYS
eg deg 0.76 24.31 1.62 23.13 0.29 22.63 0.43 24.21 0.94 25.48 0.37 27.43 1.34 29.30 0.14 29.58 0.78 31.71 0.71 29.33	ft 910.08 908.42 905.21 909.38 907.72 907.55 907.24 905.56 910.30	ft 926.12 1017.43 1109.54 1201.39 1291.78 1381.36 1469.67 1556.44	ft 709.40 750.11 788.89 828.17 870.88 915.29	ft 1152.54 1252.21 1351.65 1451.10 1550.92 1650.83	deg/100ft 0.84 1.47 2.39 1.59 1.97	deg/100f 0.47 0.87 -2.33 0.14 1.51	-0.69 -1.18 -0.50 1.58	MWD-SDI-S MWD-SDI-S MWD-SDI-S MWD-SDI-S	SYS SYS SYS SYS
eg deg 0.76 24.31 1.62 23.13 0.29 22.63 0.43 24.21 0.94 25.48 0.37 27.43 1.34 29.30 0.14 29.58 0.78 31.71 0.71 29.33	ft 910.08 908.42 905.21 909.38 907.72 907.55 907.24 905.56 910.30	ft 926.12 1017.43 1109.54 1201.39 1291.78 1381.36 1469.67 1556.44	ft 709.40 750.11 788.89 828.17 870.88 915.29	ft 1152.54 1252.21 1351.65 1451.10 1550.92 1650.83	deg/100ft 0.84 1.47 2.39 1.59 1.97	deg/100f 0.47 0.87 -2.33 0.14 1.51	-0.69 -1.18 -0.50 1.58	MWD-SDI-S MWD-SDI-S MWD-SDI-S MWD-SDI-S	SYS SYS SYS SYS
1.62 23.13 0.29 22.63 0.43 24.21 0.94 25.48 0.37 27.43 1.34 29.30 0.14 29.58 0.71 29.33	908.42 905.21 909.38 907.72 907.55 907.24 905.56 910.30	1017.43 1109.54 1201.39 1291.78 1381.36 1469.67 1556.44	750.11 788.89 828.17 870.88 915.29	1252.21 1351.65 1451.10 1550.92 1650.83	1.47 2.39 1.59 1.97	0.87 -2.33 0.14 1.51	-1.18 -0.50 1. 5 8	MWD-SDI-S MWD-SDI-S MWD-SDI-S	sys Sys Sys
29 22.63 0.43 24.21 0.94 25.48 0.37 27.43 1.34 29.30 0.14 29.58 1.76 31.71 0.71 29.33	905.21 909.38 907.72 907.55 907.24 905.56 910.30	1109.54 1201.39 1291.78 1381.36 1469.67 1556.44	788.89 828.17 870.88 915.29	1351.65 1451.10 1550.92 1650.83	2.39 1.59 1.97	-2.33 0.14 1.51	-0.50 1.58	MWD-SDI-S MWD-SDI-S	SYS SYS
24.3 24.21 9.94 25.48 9.37 27.43 1.34 29.30 9.14 29.58 1.76 31.71 9.71 29.33	909.38 907.72 907.55 907.24 905.56 910.30	1201.39 1291.78 1381.36 1469.67 1556.44	828.17 870.88 915.29	1451.10 1550.92 1650.83	1.59 1.97	0.14 1.51	1.58	MWD-SDI-S	SYS
0.94 25.48 0.37 27.43 1.34 29.30 0.14 29.58 1.78 31.71 0.71 29.33	907.72 907.55 907.24 905.56 910.30	1291.78 1381.36 1469.67 1556.44	870.88 915.29	1550.92 1650.83	1.97	1.51			
1.34 29.30 0.14 29.58 1.78 31.71 0.71 29.33	907.24 905.56 910.30	1469.67 1556.44			2 50				
1.34 29.30 0.14 29.58 1.78 31.71 0.71 29.33	905.56 910.30	1556.44	962.20		£.3U	-1.57	1.95	MWD-SDI-S	SYS
6.78 31.71 0.71 29.33	910.30			1750.82	2.72	1.97	1.88	MWD-SDI-S	SYS
0.71 29.33			1011.86	1850.77	2.22	-2.20	0.28	MWD-SDI-S	
	911.26	1642.42	1062.66	1950,57	3.17	-2.35	2.12	MWD-SDI-S	
.10 29.68		1728.67	1113.20	2050.49	4,59	3.93	-2.38	MWD-SDI-S	SYS
	910.72	1815.60	1162.62	2150.47	0.70	-0.61	0.35	MWD-SDI-S	
1.63 31.89	908.64	1901.63	1213.50	2250.36	2.68 2.89	1.53	2.21 0.09	MWD-SDI-S	
3.74 31.98 3.83 24.07	908.57 910.72	1986.43 2074. 7 5	1266.48 1313.12	2350.16 2450.03	2.89	-2.89 1.09	-7.91	MWD-SDI-S MWD-SDI-S	
3.07 26.11	906.64	2165.34	1355.18	2549.71	3.83	3.24	2,04	MWD-SDI-S	
60 27.25	903 44	2254 57	1400 18	2649 60	2 79	-2 47	1.14	MWD-SDL9	SYS
								MWD-SDI-S	
.65 28.74	897.75	2431.17	1493.79	2849.46	1,40	-0.32	1.36	MWD-SDI-S	SYS
8.61 28.30	897.39	2519.02	1541.53	2949.45	3.08	-3.05	-0.44	MWD-SDI-S	SYS
.03 28.14	900.89	2607.41	1588.16	3049.38	0.45	0.43	-0.15	MWD-SDI-S	SYS
.72 28.73	901.69	2695.29	1635.87	3149.37	0.90	0.68	0.59	MWD-SDI-S	
80 28.66	900.59		1684.08		0.11				
).94 29.73).75 30.54	897.43	2958.27 3044.79	1780.14	3449.32 3549.26	0.83	-0.38	0.81	MWD-SDI-S	
					4.02	0.00	0.50		
1.04 29.77	893.91	3226.54	1935.40	3759.17	0.00	0.00	0.00	MWD-SDI-S	
					p Ma				Longitude
Description	TVI fi					iog C	deg Min Se	c Deg	Min Sec
)	917.0	0 330.1	10 275.	62 49515	51.88169814	9.89	39 51 16.22	4 N 80 3	34 30.660 W
TD	917.0	10 3236.1	97 1919.	48 49805	58.75169979	3.75	39 51 45.14	15 N 80 3	34 10.026 W
	.07 26.11 .07 27.25 .97 27.38 .65 28.74 .61 28.30 .03 28.14 .72 28.73 .80 28.66 .32 28.31 .94 29.73 .75 30.54 .84 30.04 .04 29.77 .04 29.77 .04 29.77 .04 29.77	07 26.11 906.64 60 27.25 903.44 97 27.38 902.26 65 28.74 897.75 61 28.30 897.39 03 28.14 900.89 72 28.73 901.69 80 28.66 900.59 32 28.31 899.80 94 29.73 897.43 75 30.54 895.23 84 30.04 895.02 04 29.77 893.91 Description TVC ft 917.0 adius: 1) TD 917.0	07 26.11 906.64 2165.34 60 27.25 903.44 2254.57 97 27.38 902.26 2343.34 65 28.74 897.75 2431.17 61 28.30 897.39 2519.02 .03 28.14 900.89 2607.41 .72 28.73 901.69 2695.29 80 28.66 900.59 2782.89 .32 28.31 899.80 2870.87 .94 29.73 897.43 2958.27 .75 30.54 895.02 3131.15 .04 29.77 894.10 3217.86 .04 29.77 893.91 3226.54 Description TVD +N/-ft .04 29.77 893.91 3226.54 TO 917.00 330. adius: 1) 917.00 3236.5	0.07 26.11 906.64 2165.34 1355.18 60 27.25 903.44 2254.57 1400.18 .97 27.38 902.26 2343.34 1446.21 .65 28.74 897.75 2431.17 1493.79 .61 28.30 897.39 2519.02 1541.53 .03 28.14 900.89 2607.41 1588.16 .72 28.73 901.69 2695.29 1635.87 .80 28.66 900.59 2782.89 1684.08 .32 28.31 899.80 2870.87 1731.62 .94 29.73 897.43 2958.27 1780.14 .75 30.54 895.02 3131.15 1880.63 .04 29.77 894.10 3217.86 1930.44 .04 29.77 893.91 3226.54 1935.40	07 26.11 906.64 2165.34 1355.18 2549.71 60 27.25 903.44 2254.57 1400.18 2649.60 .97 27.38 902.26 2343.34 1446.21 2749.57 .65 28.74 897.75 2431.17 1493.79 2849.46 .61 28.30 897.39 2519.02 1541.53 2949.45 .03 28.14 900.89 2607.41 1588.16 3049.38 .72 28.73 901.69 2695.29 1635.87 3149.37 .80 28.66 900.59 2782.89 1684.08 3249.36 .32 28.31 899.80 2870.87 1731.62 3349.35 .94 29.73 897.43 2958.27 1780.14 3449.32 .75 30.54 895.02 3131.15 1880.63 3649.21 .04 29.77 894.10 3217.86 1930.44 3749.18 .04 29.77 893.91 3226.54	.07 26.11 906.64 2165.34 1355.18 2549.71 3.83 .60 27.25 903.44 2254.57 1400.18 2649.60 2.72 .97 27.38 902.26 2343.34 1446.21 2749.57 1.38 .65 28.74 897.75 2431.17 1493.79 2849.46 1.40 .61 28.30 897.39 2519.02 1541.53 2949.45 3.08 .03 28.14 900.89 2607.41 1588.16 3049.38 0.45 .72 28.73 901.69 2695.29 1635.87 3149.37 0.90 .80 28.66 900.59 2782.89 1684.08 3249.36 0.11 .32 28.31 899.80 2870.87 1731.62 3349.35 1.56 .94 29.73 897.43 2958.27 1780.14 3449.32 1.48 .75 30.54 895.02 3131.15 1880.63 3649.21 1.03 .04 29.77 894.10 3217.86 1930.44 3749.18 1.23	07 26.11 906.64 2165.34 1355.18 2549.71 3.83 3.24 60 27.25 903.44 2254.57 1400.18 2649.60 2.72 -2.47 .97 27.38 902.26 2343.34 1446.21 2749.57 1.38 1.37 .65 28.74 897.75 2431.17 1493.79 2849.46 1.40 -0.32 .61 28.30 897.39 2519.02 1541.53 2949.45 3.08 -3.05 .03 28.14 900.89 2607.41 1588.16 3049.38 0.45 0.43 .72 28.73 901.69 2695.29 1635.87 3149.37 0.90 0.68 .80 28.66 900.59 2782.89 1684.08 3249.36 0.11 0.09 .32 28.31 899.80 2870.87 1731.62 3349.35 1.56 1.51 .94 29.73 897.43 2958.27 1780.14 3449.32 1.48 -0.	07 26.11 906.64 2165.34 1355.18 2549.71 3.83 3.24 2.04 60 27.25 903.44 2254.57 1400.18 2649.60 2.72 -2.47 1.14 .97 27.38 902.26 2343.34 1446.21 2749.57 1.38 1.37 0.13 .65 28.74 897.75 2431.17 1493.79 2849.46 1.40 -0.32 1.36 .61 28.30 897.39 2519.02 1541.53 2949.45 3.08 -3.05 -0.44 .03 28.14 900.89 2607.41 1588.16 3049.38 0.45 0.43 -0.15 .72 28.73 901.69 2695.29 1635.87 3149.37 0.90 0.68 0.59 .80 28.66 900.59 2782.89 1684.08 3249.36 0.11 0.09 -0.07 .32 28.31 899.80 2870.87 1731.62 3349.35 1.56 1.51 -0.36 <td>$\begin{array}{cccccccccccccccccccccccccccccccccccc$</td>	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

47.0.5 0.1 100

Scientific Drilling Survey Report - Geographic

SEP 2 5 2017

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Company Field: Site: Well: Wellpath:	MC 57 WI ACCESS	LL COUNTY ELL LOCATI	'. WV			Date: 5/8/200 Co-ordinate(NE Vertical (TVD) Section (VS) Re Survey Calculat	C) Reference: Reference: ference:	GL 1343. Weii (0.0		Pag 7, Grid Noi .1 1.55Azi)	e: 1
Field:	Northern	ALL COUNT West Virgin	Y, WV tia and Pe	ennsylvania (perations						
Geo Datu	U.S.A. tem:US State tm: NAD27 (m: Mean Se	Clarke 1866	rdinate Sy	ystem 1927		Map Zone: Coordinate Geomagnet		West Virgini Well Centre Igrf2005	a, Northern	Zone	
Site:	MC 57 V	ELL LOCAT	TION						······		
Site Pasit From: Position I Ground I	ion: Map Jocertainty:	Co., WV 0.(1343. ⁻	E 00 ft		494821.78 597874.27		80 ence:	51 12.929 34 34.143 Grid -0.69	Ŵ		
Well:	ACCESS	MC-57				Slot Name:					
Well Posi Position (E/-W 0.0		iorthing: asting : 10	494821.78 597874.27 1	t Latitude: t Longitude:	39 80	51 12.929 34 34.143			
Wellpath: Current E Magnetic Field Stre Vertical S	Datum: G Data: ngth:	ENTER LEG L 1343.14 + 4/25/200 5329 pth From (T' ft	8)8)2 nT	! +	1351.14 f W-S	Drilled From Tie-on Dept Above Syste Declination: Mag Dip An +E/-W ft	h: m Datum: gle:	EAST LEG 1479.00 Mean Sea Le -8.48 67.82 Direction	deg		
******		0.00			00	0.00		deg 8.55	·····		
Survey Pr Date: 5/ Actual Fro ft 50.00	om To ft	Velidate Survey	đ: No			Version: O Toolcode		Name			
50.00 646.00 1321.00 1479.00 Survey	646.00 1321.00 1479.00 4610.00	Survey # Survey # Survey # Survey #	#2 (0) #1 (3)			Drop Gyro-SYS MWD-SDI-SYS MWD-SDI-SYS	Scier	Gyro System ntific MWD Syntific MWD Syntific MWD Syntheside	/stematic		
MD ft	Inci	Azim	TVD	• • • =		Map Northing	Map Easting	< Lati Deg Min	tude> Sec	< Long Deg Min	itude> Sec
0.00	deg 0.48	deg 226.20	ft 0.06	ft 0 0.00	ft) 0.00	ft 494821.78	ft 1697874.27			_	
100.00 200.00 300.00 400.00	0.17 0.23 0.42 0.32	274.10 200.30 151.50	100.00 200.00 300.00	0 -0.22 0 -0.36 0 -0.89	2 -0.32 5 -0.55 9 -0.43	494821.56 494821.42 494820.89	1697873.95 1697873.72 1697873.84	39 51 39 51 39 51	12.929 N 12.927 N 12.925 N 12.920 N	80 34 80 34	34.143 W 34.147 W 34.150 W 34.148 W
500.00 600.00	0.32 0.48 0.34	170.30 126.10 140.00	399.99 499.99 599.99	-2.03	0.15		1697874.08 1697874.42 1697874.98	39 51	12.913 N 12.909 N	80 34 80 34	34.145 W 34.141 W
700.00 800.00 900.00	0.64 27.74 59.11	166.50 35.36 39.60	699.99 797.25 866.49	-3.34 5 10.16	0.71	494818.44 494831.94 494887.74	1697874,98 1697885.51 1697928.31	39 51 39 51	12.904 N 12.896 N 13.031 N 13.587 N	80 34 80 34	34.133 W 34.133 W 34.000 W 33.460 W
1000.00 1100.00 1200.00	75.58 86.34 89.19	38.99 39.04 39.46	904.82 916.13 9 18.78	213.75 291.42	175.48 238.40	494959.14 495035,53 495113.20	1697986.46 1698049.75 1698112.67	39 51	14.300 N 15.062 N 15.837 N	80 34 80 34	32.726 W 31.926 W 31.131 W
1300.00 1400.00	90.65 92.85 90.52	40.17 47.87 48.57	918.56 916.54	439.86	372.07	495189.15 495261.64	1698177.71 1698246.34	39 51 39 51	16.595 N 17.320 N	80 34 80 34	30.309 W 29.440 W
13401401	90.52	48.57 40.60	912.99 912.39		517.08	495326.89 495398.84	1698321.99 1698391.35		17.974 N 18.693 N		28.480 W 27.601 W
1500.00 1600.00 1700.00 1800.00 1900.00	89.86 90.79 90.29	31.51 26.84 25.00	912.40 912.34 910.43	745.35	623.93	495479.03 495567.13 495656.95	1698450.95 1698498.20 1698542.10	39 51	19.492 N 20.369 N		26.850 W 26.257 W



Scientific Drilling Survey Report - Geographic

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Company: Field: Site:	MARSHA MC 57 W	Company, LLC LL COUNTY, V ELL LOCATIO	w		Date: 5/8/2008 Time: 11:05:10 Co-ordinate(NE) Reference: Well: ACCESS MC-5 Vertical (TVD) Reference: GL 1343.14 + 8 135 Section (VS) Reference: Well (0.00N,0.00E,2)						l. İ				
Well:	ACCESS					ion (VS) Refe							_		
Wellpath:	EAST CE	NTER LEG			Sun	ey Calculatio	n Method:	Minimum		D	b: S	yoas	8		
Survey															
						Мар	Мар		itude —>		Longit		>		
MD	Incl	Azim	TVD	+N/-S	+E/-W	Northing	Easting	Deg Min	Sec	Deg	Min	Sec			
ft	deg	deg	ft	<u>f</u>	<u>ft</u>	ft	fl								
	00.76	04.94	910.08	926.12	709.40	495747,90	1698583.67	39 51	22.165 N	80 3	M 2	5.189	3 10		
2000.00 2100.00	90.76 91.62	24.31 23.13	910.08 908.42	920.12 1017.43	709.40	495/47.80	1698624.38	39 51	23.072 N	80 3		4.681			
			905.21	1109.54	788.89	495931.32	1698663.16	39 51	23.987 N	80 3		4.198			
2200.00	89.29	22.63	909.38	1201.39	828.17		1698702.44	39 51	24.899 N			3.708			
2300.00	89.43	24.21				496023.17	1698745.15	39 51	25.798 N			3.175			
2400.00	90. 9 4	25.48	907.72	1291.78	870.88	490113.30	1090/45.15	29 21	23.790 14	00 3	~ 2	3,173			
2500.00	89.37	27.43	907.55	1381.36	915.29		1698789.56	39 51	26.688 N	80 3		2.619			
2600.00	91.34	29.30	907.24	1469.67	962.20		1698836.47	39 51	27.567 N			2.031			
2700.00	89.14	29.58	905.56	1556.44	1011.86	496378.22	1698886.13	39 51	28.430 N			1.407			
2800.00	86.78	31.71	910.30	1642.42	1062.66	496464.20	1698936.93	39 51	29.286 N			0.769			
2 9 00.00	90.71	29.33	911.26	1728.67	1113.20	496550.45	1698987.47	39 51	30.144 N	80 3	94 2	0.134	V		
3000.00	90.10	29.68	910.72	1815.60	1162.62	496637.38	1699036.89	39 51	31.009 N	8D 3	14 1 ¹	9.514	ı v		
3100.00	91.63	31.89	908.64	1901.63	1213.50		1699087.77	39 51	31.865 N	80 3		8.875			
3200.00	88.74	31.98	908.57	1986.43	1265.48		1699140.75	39 51	32,709 N	80 3		8.208			
3300.00	89.83	24.07	910.72	2074.75	1313.12		1699187.39	39 51	33.588 N	80 3		7.624			
	93.07	24.07	906.64	2165.34	1355.18	496987.12	1699229.45	39 51	34.488 N	80 3		7.098			
3400.00	93.07	20.11	500.04	2105.34	1355.10	430307.12	1055225,40	33 31	04.400 M	00 .		1.000			
3500.00	90.60	27.25	903.44	2254.57	1400.18	497076.35	1699274.45	39 51	35.375 N	80 3		6.535			
3600.00	91.97	27.38	902.26	2343.34	1446.21	497165,12	1699320.48	39 51	36.258 N	80 3		5.958			
3700.00	91.65	28.74	897.75	2431.17	1493.79	497252.95	1699368.06	39 51	37.131 N	80 3	1 1	5.362	2 V		
3600.00	88.61	28.30	897.39	2519.02	1541.53	497340.80	1699415.80	39 51	38.005 N	80 3	14 1-	4.763	3 V		
3900.00	89.03	28.14	900.89	2607.41	1588.16	497429,19	1699462.43	39 51	38.884 N	80 3	94 1 [.]	4.178	3 V		
4000.00	89.72	28.73	901.69	2695.29	1635.87	497517.07	1699510.14	39 51	39.758 N	80 3	и 1	3.580	۱v		
4000.00	89.80	28.66	900.59	2782.89	1684.08		1699558.35	39 51	40.630 N	80 3		2.975			
4100.00			900.59 899.80	2870.87	1731.62	497692.65	1699605.89	39 51	41.505 N	80 3		2.379			
4200.00	91.32 90.94	28.31 29.73	899.80 897.43	2958.27	1780.14	497892.05	1699654.41	39 51	41.505 N 42.374 N	80 3		2.375			
4300.00					1780.14	497760.05	1699704.50	39 51	42.374 N 43.235 N	80 3		1.141			
4400.00	90.75	30.54	895.23	3044.79	1030.23	43/000.3/	1039704.30	33 31	4J.2JJ IN	00 3	~ I	1.141			
4500.00	89.84	30.04	895.02	3131.15	1880.63	497952.93	1699754.90	39 51	44.095 N	80 3		0.508			
4600.00	91.04	29.77	894.10	3217.86	1930.44	498039.64	1699804.71	39 51	44.957 N	80 3		9.882			
4610.00	91.04	29.77	893.91	3226.54	1935.40	498048.32	1699809.67	39 51	45.044 N	80 3	94	9.820) V		
Targets															
						Мар	Мар		atitude>		Long				
Name		Description	TVD ft	+N/-S ft	+E/-W ft	Northin ft	g Easting ft	Deg M	ln Sec	Deg	Min	Sec			
	ept TD		917.00	330.1	0 275.62	495151.8	38 1698 149.89	39 51	16.224 N	80	34 30	.660	W		
East C	cle (Radiu Center TD	•	917.00	3236.9	7 1919.48	498058.7	751699793.75	39 51	39 51 45.145 N			80 34 10.026 W			
-Re	ctangle (29	962x200)													