

JK

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Well Operator's Report of Well Work

API 47-001-03254H County Barbour District Pleasant
Quad Philippi Pad Name PHL10HS Field/Pool Name Philippi
Farm Name WATSON, MARY LOU & RONALD EARL CATE Well Number PHL10DHS
Operator (as registered with the OOG) CNX Gas Company LLC
Address P.O. Box 1248 City Jane Lew State WV Zip 26378

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top Hole Northing 4,340,916.71 m Easting 583,181.67 m
Landing Point of Curve Northing 4,340,726.88 m Easting 583,120.04 m
Bottom Hole Northing 4,339,716.10 m Easting 583,715.50 m

Elevation (ft) 1618.50' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilled Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine

Mud Type(s) and Additive(s)

Mineral Oil Based Mud, Bactericide, Polymers and Weighting Agents.

Date Permit Issued 10/13/2011 Date drilling commenced 08/10/2013 Date drilling ceased 04/23/2014
Date completion activities began 07/02/2014 Date completion activities ceased 07/17/2014
Verbal plugging (Y/N) N Date permission granted N/A Granted by N/A

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plu

Freshwater depth(s) ft 310', 580' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1815' Void(s) encountered (Y/N) depths N
Coal depth(s) ft None Reported Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) Y

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CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement Circulate (Y/N) * Provide details to the right *
Conductor	26"	20"	100'	N	J-55 96# / 100'	N/A	Y
Surface	17 1/2"	13 3/8"	638'	N	J-55 54.5# / 638'	44'/123'	Y
Coal	-	-	-	-	-	-	-
Intermediate 1	12 1/4"	9 5/8"	2009'	N	J-55 36# / 2009'	47'/127'	Y
Intermediate 2	-	-	-	-	-	-	-
Intermediate 3	-	-	-	-	-	-	-
Production	8 3/4"	5 1/2"	12258'	N	P-110 20# / 12258'	N/A	N
Tubing	5 1/2"	2 3/8"	7894'	N	P-110 4.7# / 7894'	N/A	N
Packer Type and Depth Set	None						

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft 3/sks)	Volume (ft 3)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	146	16.2	1.20	177	Surface	8
Surface	Class A	466	15.2	1.27	810	Surface	8
Coal	-	-	-	-	-	-	-
Intermediate 1	Class A	642	15.2	1.20	770	Surface	8
Intermediate 2	-	-	-	-	-	-	-
Intermediate 3	-	-	-	-	-	-	-
Production	Class A	2167	14.8	1.25	2708	1808'	8
Tubing	-	-	-	-	-	-	-

Drillers TD (ft) 7708' Loggers TD (ft) 7879'
 Deepest formation penetrated: Lower Marcellus Plug back to (ft) N/A
 Plug back procedure: N/A

Kick Off Depth (ft) 5365'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well Cored Yes No Conventional Sidewall Were Cuttings Collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____
Conductor - No centralizers used.. Fresh Water - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface.. Coal - Bow spring centralizers on first joint then every fourth joint to 100 feet from surface.. Intermediate - Bow spring centralizers one on the first two joints and every fourth joint until inside surface casing.. Production - Rigid bow spring centralizer on first joint then every 2 casing joints (free floating) through the lateral and the curve. (Note: cementing the 5 1/2" casing completely in open hole lateral and curve.)

WAS WELL COMPLETED AS SHOT HOLE No Yes DETAILS Plug and Perforation Shot Hole

WAS WELL COMPLETED OPEN HOLE Yes No DETAILS _____

WERE TRACERS USE Yes No TYPES OF TRACER(S) USED _____

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number Of Perforations	Formation(s)
					See Attached

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Avg Pump Rate (BPM)	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen / other (gals)
								See Attached

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Please insert additional pages as applicable.

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number Of Perforations	Formation(s)
1	7/2/2014	12229	12159	48	Marcellus
2	7/3/2014	12135	12013	40	Marcellus
3	7/3/2014	11985	11863	40	Marcellus
4	7/3/2014	11835	11713	40	Marcellus
5	7/4/2014	11685	11563	40	Marcellus
6	7/4/2014	11535	11413	40	Marcellus
7	7/5/2014	11385	11263	40	Marcellus
8	7/5/2014	11235	11113	40	Marcellus
9	7/5/2014	11085	10963	40	Marcellus
10	7/6/2014	10935	10813	40	Marcellus
11	7/7/2014	10785	10663	40	Marcellus
12	7/7/2014	10635	10513	40	Marcellus
13	7/8/2014	10485	10363	40	Marcellus
14	7/9/2014	10335	10213	40	Marcellus
15	7/9/2014	10185	10063	40	Marcellus
16	7/10/2014	10035	9913	40	Marcellus
17	7/10/2014	9885	9763	40	Marcellus
18	7/11/2014	9735	9613	40	Marcellus
19	7/12/2014	9585	9463	40	Marcellus
20	7/12/2014	9435	9313	40	Marcellus
21	7/13/2014	9285	9163	40	Marcellus
22	7/13/2014	9135	9013	40	Marcellus
23	7/15/2014	8985	8863	40	Marcellus
24	7/15/2014	8835	8713	40	Marcellus
25	7/16/2014	8685	8563	40	Marcellus
26	7/16/2014	8535	8413	40	Marcellus
27	7/17/2014	8385	8263	40	Marcellus
28	7/17/2014	8235	8113	40	Marcellus
29	7/17/2014	8085	7963	40	Marcellus

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STIMULATION INFORMATION PER STAGE

Stage No.	Stimulations Date	Avg Pump Rate (BPM)	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen / other (gals)
1	7/2/2014	81.7	8286	7028	4924	228550	6165	3452
2	7/3/2014	73.9	8356	7619	5276	330160	8691	3650
3	7/3/2014	84	8607	7555	5266	327050	6785	3654
4	7/3/2014	67.8	8418	8400	5232	384000	8225	3622
5	7/4/2014	82.8	8471	8180	5453	325470	6969	3499
6	7/4/2014	74	8452	7495	5329	326780	6468	3582
7	7/5/2014	84	8395	7817	5422	325920	7706	3705
8	7/5/2014	79.2	8477	7971	5469	313890	6453	3533
9	7/5/2014	51.2	8430	8271	6128	296430	15219	11308
10	7/6/2014	66.7	8382	7381	6776	295930	9958	6782
11	7/7/2014	78.5	8253	7646	5770	327500	6615	3711
12	7/7/2014	81	8295	8418	5321	330750	6723	3445
13	7/8/2014	77.2	8389	8062	5703	326680	10306	4009
14	7/9/2014	86	8279	7343	5486	322350	6386	3721
15	7/9/2014	86.4	8001	6908	5400	325210	6487	3544
16	7/10/2014	89.7	8107	7069	5550	323950	6643	3411
17	7/10/2014	89.6	8044	9314	5981	311150	6240	3490
18	7/11/2014	93.3	8103	6322	5794	328120	6738	3432
19	7/12/2014	90	8205	6524	5684	313480	7399	3440
20	7/12/2014	91.7	7997	6548	5642	339780	7812	3414
21	7/13/2014	91.6	8271	6574	5332	327920	7663	3581
22	7/13/2014	92.3	8884	6132	5575	326300	7376	3437
23	7/15/2014	90.2	7973	6586	5300	325290	6628	3328
24	7/15/2014	92	7876	6358	5944	325580	7946	3527
25	7/16/2014	92	7577	5889	5812	327340	6340	3385
26	7/16/2014	91.8	7593	6151	5169	326250	9045	3537
27	7/17/2014	92.7	7786	5865	5625	324920	6614	3496
28	7/17/2014	99	7831	6662	4847	326390	6926	3531
29	7/17/2014	94	7669	8138	4918	364320	7392	3529

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PRODUCING FORMATION(S)	DEPTHS	TVD	MD
MIDDLE MARCELLUS	7833'- 7865'		

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface 1500 psi Bottom Hole 4855 psi DURATION OF TEST 134 hrs
 OPEN FLOW Gas 4204 mcfpd Oil 0 bpd NGL 0 bpd Water 1146 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY / FORMATION	TOP DEPTH IN FT TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY TYPE OF FLUID (FRESHWATER,BRINE,GAS,H2S, ETC)
					SEE ATTACHED

Please insert additional pages as applicable.

Drilling Contractor Nabors Drilling USA
 Address 515 West Greens Road, Ste 1000 City Houston State TX Zip 77067
 Logging Company Horizon
 Address 7136 South Yale, Suite 414 City Tulsa State OK Zip 74136-6378
 Cementing Company CalFrac
 Address 2001 Summit View Rd City Smithfield State PA Zip 15478
 Stimulating Company CalFrac
 Address 2001 Summit View Rd City Smithfield State PA

Please insert additional pages as applicable.

Completed by CNX Gas WV Operations Company, LLC - Drilling and Completions Telephone 304-884-2000
 Signature Steve Spitler Title Steve Spitler - Completions Manager-Gas WV

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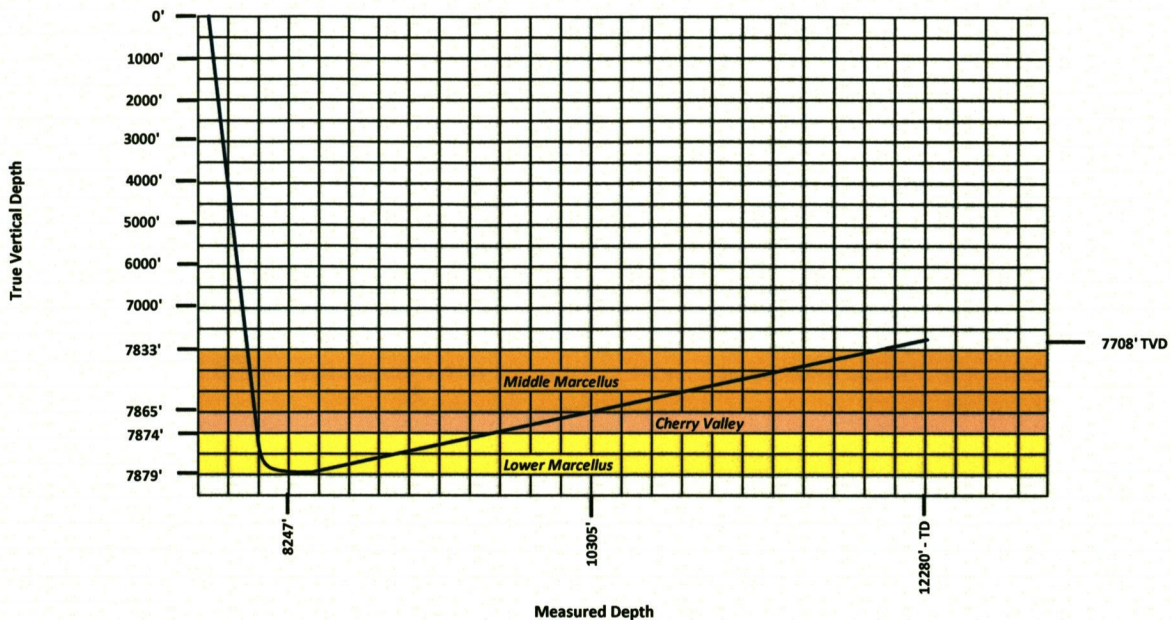
Farm name WATSON, MARY LOU &
RONALD EARL CATE

Well number PHL10DHS

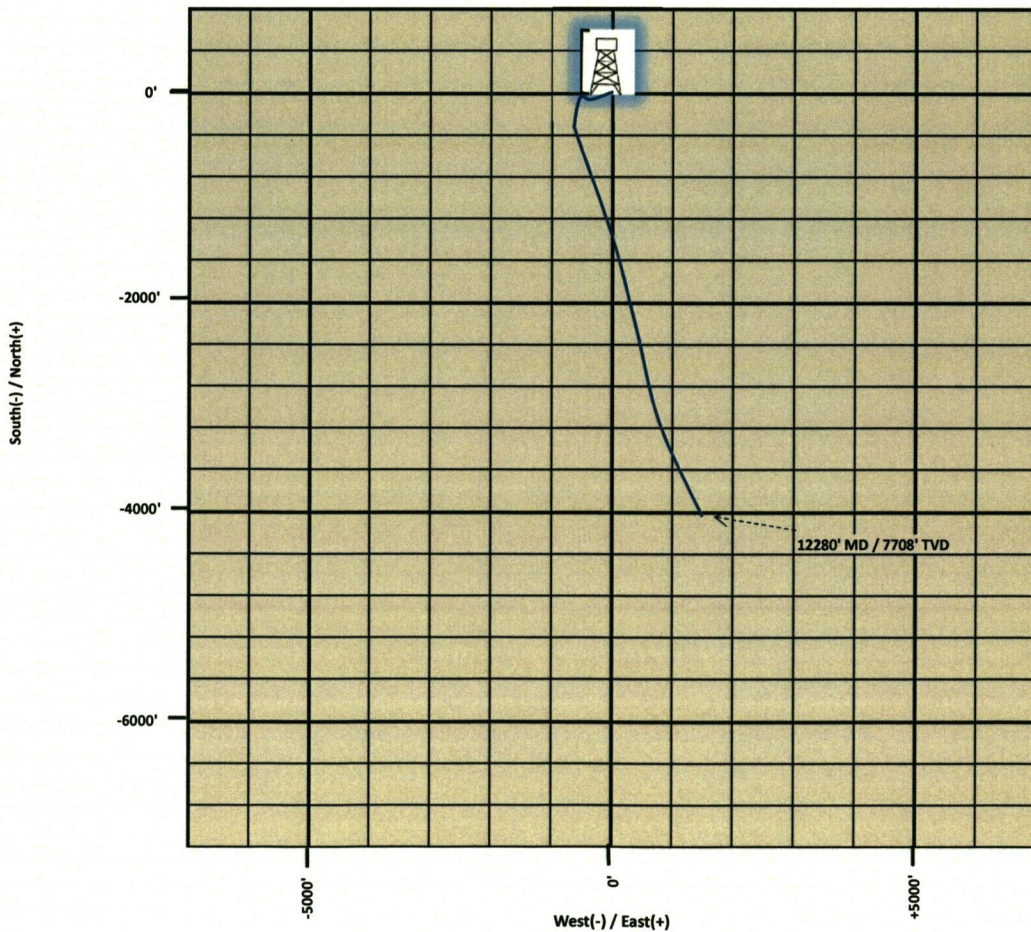
LITHOLOGY / FORMATION	TOP	BOTTOM	TOP	BOTTOM	DESCRIBE ROCK TYPE AND RECORD QUANTITY TYPE OF FLUID (FRESHWATER,BRINE,GAS,H2S, ETC)
	DEPTH IN FT TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
FILL	0	100			
SAND	100	240			Light Gray
SHALE	240	300			Dark Gray
SHALE	300	470			Light Gray
SAND	470	500			Light Gray
SHALE	500	720			Gray
SAND	720	950			Light Gray
SHALE	950	1100			Light Gray
SANDY/SHALE	1100	1160			Dark Gray
SAND	1160	1400			Light Gray
SHALE	1400	1660			Dark Gray
REDROCK	1660	1700			Red
LIME	1700	1950			Tan
SHALE	1950	1980			Dark Gray
SAND	1980	2200			Gray
SHALE	2200				Light Gray
FOURTH SAND	2313	2346			
SPEECHLEY	3166	3177			
BALLTOWN	3351	3387			
BRADFORD	3653	3895			
RILEY	4083	4264			
BENSON	4477	4543			
FIRST ELK	4709	4767			
SECOND ELK	4861	4941			
THIRD ELK	5120	5158			
FOURTH ELK	5391	5429			
SYCAMORE GRIT	6717	7121			
FRIB	7121	7571			
BURKETT	7571	7592			
TULLY LIMESTONE	7592	7651			
HAMILTON SHALE	7651	7817			
UPPER MARCELLUS	7817	7833			
MIDDLE MARCELLUS	7833	7865			
CHERRY VALLEY	7865	7874			
LOWER MARCELLUS	7874	7879			

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CNX PHL10DHS - Views Profile View



As Drilled View



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CNX PHL10DHS Gyro+MWD 6939.5ft to update Survey Report

(Non-Def Survey)

Report Date: April 21, 2014 - 12:05 PM
Client: CNX
Field: WV Barbour County (NAD27)
Structure / Slot: CNX PHL10 Pad / PHL10DHS
Well: PHL10DHS
Borehole: Original Borehole
UWI / AP#: Unknown / Unknown
Survey Name: CNX PHL10DHS Gyro+MWD 6939.5ft to update
Survey Date: April 08, 2014
Tort / AHD / DDI / ERD Ratio: 215.567 ° / 5032.484 ft / 6.228 / 0.639
Coordinate Reference System: NAD27 West Virginia State Plane, Northern Zone, US Feet
Location Lat / Long: N 39° 12' 48.42423", W 80° 2' 12.06047"
Location Grid N/E Y/X: N 260307.685 ftUS, E 1847932.338 ftUS
CRS Grid Convergence Angle: -0.3423 °
Grid Scale Factor: 0.9999665
Version / Patch: 2.7.1043.0

Survey / DLS Computation: Minimum Curvature / Lubinski
Vertical Section Azimuth: 156.987 ° (Grid North)
Vertical Section Origin: 0.000 ft, 0.000 ft
TVD Reference Datum: KB
TVD Reference Elevation: 1627.940 ft above MSL
Seabed / Ground Elevation: 1605.440 ft above MSL
Magnetic Declination: -9.521 °
Total Gravity Field Strength: 999.2717mgn (9.80665 Based)
Gravity Model: GARM
Total Magnetic Field Strength: 52190.602 nT
Magnetic Dip Angle: 66.393 °
Declination Date: April 08, 2014
Magnetic Declination Model: HDGM 2013
North Reference: Grid North
Grid Convergence Used: -0.3423 °
Total Corr Mag North->Grid North: -9.1792 °
Local Coord Referenced To: Well Head

Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (N/S ft)	EW (E/W ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
SHL	0.00	0.00	0.00	0.00	0.00	N 0.00	E 0.00	0.00	0.00	N/A	295.22M
	110.50	0.60	295.22	110.50	-0.43	N 0.25	W 0.52	0.58	295.22	0.54	315.47M
	210.50	0.28	315.47	210.50	-1.03	N 0.63	W 1.16	1.32	298.64	0.37	337.71M
	310.50	0.14	337.71	310.49	-1.37	N 0.91	W 1.36	1.64	303.64	0.14	343.19M
	410.50	0.07	343.19	410.49	-1.55	N 1.08	W 1.43	1.79	307.09	0.07	17.21M
	510.50	0.15	17.21	510.49	-1.71	N 1.26	W 1.40	1.89	311.92	0.10	42.2M
	563.50	0.11	42.20	563.49	-1.78	N 1.37	W 1.35	1.92	315.32	0.13	69.06M
	610.50	0.09	69.06	610.49	-1.80	N 1.41	W 1.29	1.91	317.69	0.11	75.47M
	710.50	0.15	75.47	710.49	-1.78	N 1.47	W 1.09	1.83	323.62	0.06	83.12M
	810.50	0.21	83.12	810.49	-1.71	N 1.53	W 0.78	1.71	333.06	0.06	79M
	910.50	0.21	79.00	910.49	-1.62	N 1.58	W 0.41	1.64	345.34	0.02	81.69M
	1010.50	0.27	81.69	1010.49	-1.52	N 1.65	W 0.00	1.65	359.95	0.06	84.84M
	1110.50	0.29	84.64	1110.49	-1.39	N 1.71	E 0.48	1.78	15.78	0.02	77.85M
	1210.50	0.28	77.85	1210.49	-1.26	N 1.79	E 0.97	2.03	28.61	0.04	82.38M
	1310.50	0.32	82.38	1310.49	-1.14	N 1.87	E 1.49	2.39	38.48	0.05	77.42M
	1410.50	0.35	77.42	1410.49	-1.01	N 1.98	E 2.08	2.86	48.23	0.04	87.36M
	1510.50	0.46	87.36	1510.48	-0.82	N 2.06	E 2.76	3.45	53.26	0.13	78.65M
	1610.50	0.40	78.65	1610.48	-0.61	N 2.15	E 3.51	4.11	58.49	0.09	93.64M
	1710.50	0.44	93.64	1710.48	-0.37	N 2.19	E 4.23	4.77	62.59	0.12	88.22M
	1810.50	0.30	88.22	1810.48	-0.10	N 2.18	E 4.88	5.34	65.93	0.14	92.23M
	1910.50	0.39	92.23	1910.47	0.14	N 2.17	E 5.48	5.89	68.36	0.09	78.2M
	2010.50	0.26	78.20	2010.47	0.33	N 2.21	E 6.04	6.43	69.94	0.15	94.36M
	2110.50	0.32	94.36	2110.47	0.50	N 2.23	E 6.54	6.91	71.16	0.10	97.5M
	2210.50	0.32	97.50	2210.47	0.77	N 2.17	E 7.10	7.42	72.97	0.02	107.18M
	2310.50	0.34	107.18	2310.47	1.11	N 2.05	E 7.66	7.93	75.01	0.06	117.93M
	2410.50	0.31	117.93	2410.47	1.51	N 1.84	E 8.18	8.38	77.35	0.07	119.15M
	2510.50	0.28	119.15	2510.47	1.91	N 1.59	E 8.63	8.78	79.56	0.03	120.06M
	2610.50	0.36	120.06	2610.46	2.36	N 1.31	E 9.12	9.21	81.80	0.08	114.17M
	2710.50	0.23	114.17	2710.46	2.75	N 1.07	E 9.57	9.63	83.60	0.13	110.36M
	2810.50	0.25	110.36	2810.46	3.05	N 0.92	E 9.96	10.00	84.75	0.03	108.8M
	2910.50	0.06	108.80	2910.46	3.24	N 0.82	E 10.21	10.25	85.39	0.19	111.37M
	3010.50	0.07	111.37	3010.46	3.31	N 0.78	E 10.32	10.35	85.66	0.01	116.37M
	3110.50	0.08	116.37	3110.46	3.41	N 0.73	E 10.44	10.47	86.00	0.01	124.48M
	3210.50	0.35	124.48	3210.46	3.72	N 0.53	E 10.75	10.77	87.20	0.27	125.85M
	3310.50	1.05	125.85	3310.45	4.76	S 0.18	E 11.75	11.75	90.89	0.70	127.02M
	3410.50	1.34	127.02	3410.43	6.56	S 1.42	E 13.43	13.50	96.05	0.29	125.34M
	3510.50	1.14	125.34	3510.41	8.42	S 2.70	E 15.17	15.41	100.10	0.20	134.1M
	3610.50	0.71	134.10	3610.39	9.84	S 3.71	E 16.43	16.84	102.72	0.45	147.58M
	3710.50	0.45	147.58	3710.39	10.79	S 4.47	E 17.08	17.66	104.67	0.29	179.1M
	3810.50	0.30	179.10	3810.39	11.42	S 5.07	E 17.30	18.02	106.32	0.25	188.77M
	3910.50	0.27	188.77	3910.38	11.87	S 5.56	E 17.27	18.14	107.85	0.06	202.55M
	4010.50	0.27	202.55	4010.38	12.23	S 6.01	E 17.14	18.16	109.33	0.06	222.13M
	4110.50	0.41	222.13	4110.38	12.55	S 6.49	E 16.81	18.02	111.12	0.18	219.16M
	4210.50	0.75	219.16	4210.38	13.00	S 7.27	E 16.16	17.71	114.22	0.34	218.05M
	4310.50	0.53	218.05	4310.37	13.53	S 8.14	E 15.46	17.47	117.77	0.22	211.53M
	4410.50	0.45	211.53	4410.37	13.98	S 8.84	E 14.97	17.38	120.56	0.10	209.11M
	4510.50	0.60	209.11	4510.36	14.53	S 9.63	E 14.51	17.41	123.58	0.15	196.09M
	4610.50	0.52	196.09	4610.36	15.21	S 10.52	E 14.13	17.61	126.68	0.15	162.95M
	4710.50	0.66	162.95	4710.35	16.13	S 11.51	E 14.17	18.25	129.09	0.36	160.77M
	4810.50	0.61	160.77	4810.35	17.24	S 12.56	E 14.51	19.20	130.88	0.06	153.63M
	4910.50	0.58	153.63	4910.34	18.27	S 13.52	E 14.91	20.13	132.19	0.08	149.88M
	5010.50	0.80	149.88	5010.33	19.47	S 14.58	E 15.49	21.27	133.26	0.22	138.36M
	5110.50	0.77	138.36	5110.32	20.80	S 15.68	E 16.29	22.61	133.92	0.16	130.34M
	5210.50	0.79	130.34	5210.32	22.05	S 16.63	E 17.26	23.97	133.94	0.11	127.48M
	5295.50	1.12	127.48	5295.30	23.30	S 17.51	E 18.36	25.38	133.65	0.39	128.8M
	5320.50	0.80	128.80	5320.30	23.67	S 17.77	E 18.69	25.79	133.55	1.28	160.7M
	5365.50	0.70	160.70	5365.30	24.22	S 18.23	E 19.03	26.35	133.77	0.94	228M
	5410.50	2.10	228.00	5410.28	24.76	S 19.04	E 18.51	26.55	135.81	4.31	243.7M
	5455.50	3.30	243.70	5455.23	25.10	S 20.17	E 16.73	26.20	140.37	3.11	251.4M
	5500.50	5.00	251.40	5500.11	25.03	S 21.37	E 13.71	25.39	140.37	3.97	255.3M
	5544.50	7.40	255.30	5543.85	24.47	S 22.70	E 9.15	24.47	140.37	6.44	260.2M
	5589.50	10.20	260.20	5588.32	23.14	S 24.11	E 2.42	24.23	140.37	6.44	35.31R
	5634.50	11.50	264.70	5632.52	20.86	S 25.20	W 5.97	25.90	193.33	3.45	22.23R
	5679.50	14.10	269.00	5676.39	17.44	S 25.71	W 15.92	30.24	211.76	6.15	12.93R
	5725.50	15.50	270.20	5720.87	12.92	S 25.79	W 27.67	37.82	227.02	1.12	31.37R
	5769.50	16.00	271.30	5763.22	8.11	S 25.63	W 39.61	47.18	237.09	1.32	54.49L
	5814.50	16.50	268.90	5806.42	3.17	S 25.61	W 52.20	58.14	243.86	1.86	87.07L
	5859.50	16.60	264.80	5849.56	-1.18	S 26.32	W 64.99	70.12	247.95	2.60	104.35L

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Table with columns: Comments, MD (ft), Incl (°), Azim Grid (°), TVD (ft), VSEC (ft), NS (N/S ft), EW (E/W ft), Closure (ft), Closure Azimuth (°), DLS (°/100ft), TF (°). Contains data for MD 5905.50 to 12280.00.

Survey Type: Non-Def Survey

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Comments	MD (ft)	Incl (°)	Azim Grid (°)	TVD (ft)	VSEC (ft)	NS (N/S ft)	EW (E/W ft)	Closure (ft)	Closure Azimuth (°)	DLS (°/100ft)	TF (°)
Survey Error Model: Survey Program:	ISCWSA Rev 0 *** 3-D 95.000% Confidence 2.7955 sigma										

Description	Part	MD From (ft)	MD To (ft)	EOU Freq (ft)	Hole Size (in)	Casing Diameter (in)	Survey Tool Type	Borehole / Survey
	1	0.000	22.500	Act Stns	30.000	30.000	SLB_NSG+MSHOT-Depth Only	Original Borehole / CNX PHL10DHS Gyro+MWD 6939.5ft to update
	1	22.500	6939.500	Act Stns	30.000	30.000	SLB_NSG+MSHOT	Original Borehole / CNX PHL10DHS Gyro+MWD 6939.5ft
	1	6939.500	12280.000	Act Stns	30.000	30.000	SLB_MWD-STD	Original Borehole / CNX PHL10DHS Gyro+MWD 6939.5ft

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	7/2/2014
Job End Date:	7/18/2014
State:	West Virginia
County:	Barbour
API Number:	47-001-03254-00-00
Operator Name:	CONSOL Energy Inc.
Well Name and Number:	PHL-10D
Longitude:	-80.03659670
Latitude:	39.21334170
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	7,879
Total Base Water Volume (gal):	9,170,796
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Customer & CWS	Base Fluid & Mix Water	Water	7732-18-5	100.00000	88.60689	
Sand (Proppant), DAP-903, DWP-111, DWP-614, DWP-901, BioClear 2000, DWP-NE1	CWS	Propping Agent, Scale Inhibitor, Gel Slurry, Viscosifier, Breaker, Biocide, Non-Emulsifier	Crystalline silica (Quartz)	14808-60-7	100.00000	10.85057	
			Hydrochloric acid	7647-01-0	35.00000	0.33023	
			Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.04486	
			2-Propenoic acid, polymer with 2-propenamide, sodium salt	25987-30-8	40.00000	0.03506	
			Guar gum	9000-30-0	60.00000	0.01856	
			Calcite	471-34-1	1.00000	0.01826	
			2,2-Dibromo-3-Nitrilopropionamide	10222-01-2	20.00000	0.01334	
			Polyethylene glycol mixture	25322-68-3	70.00000	0.01334	
			Dimethylcocoamine, bis (chloroethyl) ether, diquatary ammonium salt	68607-28-3	40.00000	0.00859	
			Isopropanol	67-63-0	40.00000	0.00859	

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		2-Propenoic acid, polymer with sodium phosphonate	71050-62-9	60.00000	0.00720
		Methanol	67-56-1	15.00000	0.00605
		Illite	12173-60-3	1.00000	0.00593
		Goethite	1310-14-1	0.10000	0.00480
		Poly(oxyethylene)nonylphenol ether	9016-45-9	5.00000	0.00438
		Sorbitan monooleate	1338-43-8	5.00000	0.00438
		Biotite	1302-27-8	0.10000	0.00306
		Apatite	64476-38-6	0.10000	0.00306
		Ilmenite	98072-94-7	0.10000	0.00219
		Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00155
		Alcohols, C14-15, ethoxylated	68951-67-7	0.10000	0.00142
		Alkenes, C>10 a-	64743-02-8	0.10000	0.00142
		Modified thiourea polymer	68527-49-1	0.10000	0.00142
		Fatty acids, tall-oil	61790-12-3	0.10000	0.00142
		Ammonium Persulfate	7727-54-0	100.00000	0.00128
		Diallyldimethylammonium chloride	7398-69-8	5.00000	0.00107
		Propargyl Alcohol	107-19-7	0.10000	0.00047
		Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00046
		Formaldehyde	50-00-0	0.10000	0.00009
		Sodium chloride	7647-14-5	0.10000	0.00005

Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.

Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)