

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

API 47-001-03307H6A County Barbour District Pleasant  
Quad Philippi Pad Name PHL3HS Field/Pool Name Philippi  
Farm Name PHILIPPI DEVELOPMENT, INC. Well Number PHL3CHS  
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 4,338,905.60 m Easting 581,564.95 m  
Landing Point of Curve Northing 4,338,416.51 m Easting 581,462.86 m  
Bottom Hole Northing 4,336,845.26 m Easting 583,164.06 m

Elevation (ft) 1444.50' 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 11/19/2013 Date drilling commenced 08/06/2014 Date drilling ceased 11/14/2014  
Date completion activities began 01/07/2015 Date completion activities ceased 01/22/2015  
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 plug

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Freshwater depth(s) ft 328', 544', 665' Open mine(s) (Y/N) depths N  
Salt water depth(s) ft N/A Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 451', 544', 665' Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) Y

Reviewed by:

Batton, Daniel

JK 7/2/15

WS 7/14/15

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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"	80'	N	J-55 106.5# / 80'	N/A	Y
Surface	17 1/2"	13 3/8"	777'	N	J-55 54.5# / 777.0'	N/A	Y
Coal	-	-	-	-	-	-	-
Intermediate 1	12 1/4"	9 5/8"	2319'	N	J-55 36# / 2319.0'	N/A	Y
Intermediate 2	-	-	-	-	-	-	-
Intermediate 3	-	-	-	-	-	-	-
Production	8 3/4"	5 1/2"	16352.4'	N	P-110 20# / 16352.4'	N/A	N
Tubing	5 1/2"	2 3/8"	8200'	N	J-55 4.7# / 8200'	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	77	15.6	1.18	91	Surface	24
Surface	Class A	573	15.6	1.20	687	Surface	8
Coal	-	-	-	-	-	-	-
Intermediate 1	Class A	759	15.6	1.19	903	Surface	8
Intermediate 2	-	-	-	-	-	-	-
Intermediate 3	-	-	-	-	-	-	-
Production	Class A (Lead) / Class A (Tail)	3170	14.2 / 14.8	1.26 / 1.25	3970	2119	8
Tubing	-	-	-	-	-	-	-

Drillers TD (ft) 7502.2' Loggers TD (ft) 7739'

Deepest formation penetrated: Marcellus Plug back to (ft) N/A

Plug back procedure: N/A

Kick Off Depth (ft) 7563.52'

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  Yes  No 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)
1	1/7/2015	16226	16085	30	Marcellus
2	1/7/2015	16046	15863	40	Marcellus
3	1/8/2015	15819	15638	40	Marcellus
4	1/8/2015	15592	15409	40	Marcellus
5	1/8/2015	15365	15182	40	Marcellus
6	1/9/2015	15138	14955	40	Marcellus
7	1/9/2015	14911	14728	40	Marcellus
8	1/9/2015	14684	14501	40	Marcellus
9	1/10/2015	14457	14274	40	Marcellus
10	1/10/2015	14230	14047	40	Marcellus
11	1/10/2015	14003	13820	40	Marcellus
12	1/11/2015	13776	13593	40	Marcellus
13	1/12/2015	13549	13366	40	Marcellus
14	1/12/2015	13322	13139	40	Marcellus
15	1/13/2015	13095	12912	40	Marcellus
16	1/13/2015	12868	12685	40	Marcellus
17	1/14/2015	12641	12458	40	Marcellus
18	1/14/2015	12414	12231	40	Marcellus
19	1/15/2015	12187	12004	40	Marcellus
20	1/16/2015	11960	11774	40	Marcellus
21	1/16/2015	11730	11544	40	Marcellus
22	1/17/2015	11500	11314	40	Marcellus
23	1/17/2015	11270	11084	40	Marcellus
24	1/18/2015	11040	10854	40	Marcellus
25	1/18/2015	10806	10624	40	Marcellus
26	1/19/2015	10580	10394	40	Marcellus
27	1/19/2015	10350	10170	40	Marcellus
28	1/19/2015	10120	9934	40	Marcellus
29	1/20/2015	9890	9704	40	Marcellus
30	1/20/2015	9660	9474	40	Marcellus
31	1/20/2015	9430	9244	40	Marcellus
32	1/21/2015	9200	9014	40	Marcellus
33	1/21/2015	8970	8784	40	Marcellus
34	1/21/2015	8740	8554	40	Marcellus
35	1/22/2015	8510	8323	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	1/7/2015	66.2	8545	8996	5085	400300	10175	3923
2	1/7/2015	68	8483	8020	5190	400250	9282	3502
3	1/8/2015	66	8542	7913	5216	395900	8930	3620
4	1/8/2015	67	8516	7584	5239	400900	8882	3577
5	1/8/2015	67	8491	7566	5165	400450	9112	3519
6	1/9/2015	71	8564	7175	5393	400400	10009	3559
7	1/9/2015	69	8513	7605	5354	300150	7128	3475
8	1/9/2015	60	8345	7496	5446	301360	7118	3470
9	1/10/2015	67.9	8528	7498	5554	300050	6927	3473
10	1/10/2015	68.7	8539	6868	5485	300400	7061	3478
11	1/10/2015	65	8306	7191	5444	300200	7772	3608
12	1/11/2015	66	8330	7977	5333	300200	7659	3547
13	1/12/2015	69	8301	8604	5368	300050	6871	3537
14	1/12/2015	70	8377	7500	5346	300350	6773	3369
15	1/13/2015	65	8265	7285	5307	300100	6756	3395
16	1/13/2015	75	8247	6929	5790	300120	6994	3396
17	1/14/2015	79.4	8455	6775	5869	300050	6749	3424
18	1/14/2015	81	8321	6837	5521	300050	7072	3424
19	1/15/2015	76	8527	6776	5736	300700	6888	3425
20	1/16/2015	78	8542	6822	5566	300200	7314	3494
21	1/16/2015	70	8247	7175	5317	300450	6842	3436
22	1/17/2015	73	8223	6845	5064	300650	6835	3468
23	1/17/2015	74	8306	6945	5207	300050	6580	3359
24	1/18/2015	71.5	8255	7402	5451	300550	6490	3376
25	1/18/2015	74	8331	7450	5139	300250	6339	3474
26	1/19/2015	72	8148	7797	5487	300300	6782	3385
27	1/19/2015	78	8401	7740	5673	300200	6450	3334
28	1/19/2015	76	8165	7209	5555	301250	6728	3381
29	1/20/2015	77	8326	8015	5798	300000	6473	3297
30	1/20/2015	70	8515	7953	5824	300150	7875	3668
31	1/20/2015	68	8217	7122	5649	300610	6661	3366
32	1/21/2015	72	8372	8203	5465	300200	6339	3373
33	1/21/2015	72	8440	7910	5527	288850	6471	3393
34	1/21/2015	73	8124	7856	5127	300900	6397	3346
35	1/22/2015	79	7937	8124	5489	312000	6403	3333



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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	80			
SHALE	80	171			Red
SAND/SHALE	171	451			Red/Light Brown/Light Gray/Dark Gray
SAND/SHALE/COAL	451	515			Dark Gray / Black Gray
SAND/SHALE	515	642			Gray Brown
SHALE	642	706			Brown / Gray Brown
SAND/SHALE	706	1556			Gray Brown / Gray
SAND	1556	1588			Brown
SAND/SHALE	1588	1747			Gray Brown
SAND	1747	1809			Brown
SAND/SHALE	1809	3566			Gray Brown / Light Gray
SHALE	3566	4293			Darker Gray
SAND/SHALE	4293	5398			Light Gray
SHALE	5398	6327			Dark Gray
SAND/SHALE	6327	6831			Light Gray
SHALE	6831	7019			Dark Gray
BURKETT	7515	7542	7869	7896	Medium Gray
TULLY	7542	7588	7896	7960	Light Gray
HAMILTON SHALE	7588	7739	7966	8299	Medium Gray
MARCELLUS	7739		8299		Black

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## Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	1/7/2015
Job End Date:	1/22/2015
State:	West Virginia
County:	Barbour
API Number:	47-001-03307-00-00
Operator Name:	CONSOL Energy Inc.
Well Name and Number:	PHL 3C
Longitude:	-80.05562070
Latitude:	39.19548340
Datum:	NAD83
Federal Tribal Well:	NO
True Vertical Depth:	7,758
Total Base Water Volume (gals):	10,610,794
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	88.47259	
Sand (Proppant), DAP-903, DWP-111, DWP-614, DWP-901, DWP-NE1	CWS	Propping Agent, Scale Inhibitor, Gel Slurry, Viscosifier, Breaker, Non-Emulsifier	Crystalline silica (Quartz)	14808-60-7	100.00000	11.05062	
			Hydrochloric acid	7647-01-0	35.00000	0.31070	
			2-Propenoic acid, polymer with 2-propenamide, sodium salt	25987-30-8	40.00000	0.03951	
			Distillates (petroleum), hydrotreated middle	64742-46-7	60.00000	0.03778	
			Calcite	471-34-1	1.00000	0.01713	
			Guar gum	9000-30-0	60.00000	0.00813	
			Illite	12173-60-3	1.00000	0.00794	
			2-Propenoic acid, polymer with sodium phosphonate	71050-62-9	60.00000	0.00663	
			Dimethylcocoamine, bis (chloroethyl) ether, diquaternary ammonium salt	68607-28-3	40.00000	0.00540	
			Isopropanol	67-63-0	40.00000	0.00540	
			Goethite	1310-14-1	0.10000	0.00539	

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		Poly(oxyethylene)nonylphenol ether	9016-45-9	5.00000	0.00494
		Sorbitan monooleate	1338-43-8	5.00000	0.00494
		Methanol	67-56-1	15.00000	0.00469
		Apatite	84476-38-6	0.10000	0.00376
		Biotite	1302-27-8	0.10000	0.00376
		Ilmenite	98072-94-7	0.10000	0.00294
		Fatty acids, tall-oil	61790-12-3	0.10000	0.00133
		Alcohols, C14-15, ethoxylated	68951-67-7	0.10000	0.00133
		Alkenes, C>10 a-	64743-02-8	0.10000	0.00133
		Modified thiourea polymer	68527-49-1	0.10000	0.00133
		Quaternary ammonium compounds, bis(hydrogenated tallow alkyl)dimethyl, salts with bentonite	68953-58-2	5.00000	0.00068
		Diallyldimethylammonium chloride	7398-69-8	5.00000	0.00067
		Propargyl Alcohol	107-19-7	0.10000	0.00044
		Ammonium Persulfate	7727-54-0	100.00000	0.00033
		Oxirane, 2-methyl-, polymer with oxirane, monodecyl ether	37251-67-5	1.50000	0.00020
		Formaldehyde	50-00-0	0.10000	0.00009
		Sodium chloride	7647-14-5	0.10000	0.00004

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)

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