

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

API 47 - 061 - 01789 County Monongalia District Clay
Quad Blacksville Pad Name MEPCO Field/Pool Name _____
Farm name MEPCO, LLC Well Number MEPCO 12H
Operator (as registered with the OOG) Northeast Natural Energy LLC
Address 707 Virginia Street E., Suite 1200 City Charleston State WV Zip 25301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4390671.7 Easting 572718.0
Landing Point of Curve Northing 4390290.2 Easting 572209.5
Bottom Hole Northing 4388239.6 Easting 573565.9

Elevation (ft) 1,420' 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

Drilling 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)
Synthetic Based Mud - Horizontal Section: BIO-BASE 365, CALCIUM CHLORIDE POWDER, G-SEAL PLUS, HRP, LIME, M-I WATE (BARITE),
M-I-X II MEDIUM, MEGADRIL P SYSTEM, MEGADRIL P SYSTEM RENTAL, MEGAMUL, SAFE-CARB 250, VERSATHIN HF, VERSAWET, VG-PLUS, VINSEAL MEDIUM, WALNUT NUT PLUG MEDIUM

Date permit issued 11/03/2017 Date drilling commenced 11/27/2017 Date drilling ceased 06/01/2018
Date completion activities began 10/08/2018 Date completion activities ceased 10/20/2018
Verbal plugging (Y/N) N Date permission granted NA Granted by NA Of NA of Oil and Gas

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 906' Open mine(s) (Y/N) depths _____
Salt water depth(s) ft 2027', 2250', 2460' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 848', 930' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed

Reviewed by:
MJK 10/28/2019

API 47-061 - 01789 Farm name MEPCO, LLC Well number MEPCO 12H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	30"	24'	40'	N	52.78	N/A	Grouted In
Surface	17-1/2"	13-3/8"	1,400'	N	54.6	N/A	Y, 35 bbl
Coal							
Intermediate 1	12-1/4"	9-5/8"	2,443'	N	40	N/A	Y, 40 bbl
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	17,515'	N	20	N/A	N, 1185'
Tubing	N/A	2-7/8"		N	4.7	N/A	
Packer type and depth set							

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	4,500 PSI Grout	36	-	3 Yds	27	CTS	48
Surface	Class A + 2%	1130	15.6	1.20	1356	CTS	8
Coal							
Intermediate 1	Class A + 1%	852	15.6	1.19	1014	CTS	8
Intermediate 2							
Intermediate 3							
Production	50:50 Class A + Additives	3260	14.5	1.17	3821	1185'	48
Tubing							

Drillers TD (ft) 17,515' Loggers TD (ft) 17,485'

Deepest formation penetrated Marcellus Plug back to (ft) NA

Plug back procedure NA

Kick off depth (ft) 6167'

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 _____

Surface: Bow spring centralizers every 3rd joint or approximately 120'
 Intermediate: Bow spring centralizers every 3rd joint or approximately 120'
 Production: Rigid body centralizers placed at a minimum of every other joint (~80') from TD to surface

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

API 47- 061 - 01789 Farm name MEPCO, LLC Well number MEPCO 12H

PRODUCING FORMATION(S)	DEPTHS		
Marcellus	7890'	TVD	17,515' MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2949 psi Bottom Hole 4154 psi DURATION OF TEST 48 hrs

OPEN FLOW Gas 2524 mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	0		0		Please See Attachment

Please insert additional pages as applicable.

Drilling Contractor Highlands Drilling
Address 900 Virginia Street E. City Charleston State WV Zip 25301

Logging Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Cementing Company Universal Pressure Pumping
Address 2198 University Dr City Lemont Furnace State PA Zip 15456

Stimulating Company Producers Services
Address 109 Graham St City Zanesville State OH Zip 43701

Please insert additional pages as applicable.

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Completed by Hollie Medley Telephone 304-212-0422
Signature Hollie Medley Title Regulatory Manager Date 08/08/2019

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

Lithology/Formation	Top Depth in FT TVD	Bottom Depth in FT TVD	Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)
Shale/Sand	0	384	Shale/Sand
Shale	384	400	Shale
sand/shale	400	466	sand/shale
shale	466	470	shale
Sandstone/shale/coal	470	570	Sandstone/shale/coal
sand/shale	570	848	sand/shale
coal	848	853	coal
sand/shale	853	930	sand/shale
coal	930	933	sandstone/shale/coal - water @ 906'
sand/shale	933	1214	sand/shale
shale/red rock	1214	1651	shale/red rock
sand/shale	1651	2010	sand/shale
red rock	2010	2110	red rock
Big Lime	2110	2248	Big Lime
Big Injun	2248	2370	Big Injun
siltstone	2370	2430	siltstone
Berea	2430	2450	Berea
siltstone	2450	2610	siltstone
Gantz	2610	2630	Gantz
Upper Devonian undifferentiated	2630	2920	Upper Devonian undifferentiated
red rock/siltstone	2920	3080	red rock/siltstone
Devonian silt/sand/shale	3080	7290	Devonian silt/sand/shale
Middlesex	7290	7530	Middlesex
Burkett	7530	7710	Burkett
Geneseo	7710	7770	Geneseo
Tully	7710	7830	Tully
Hamilton	7830	7890	Hamilton
Marcellus	7890	8082	Marcellus
Onondaga	8082	8114	Onondaga
Huntersville chert	8114		Huntersville chert

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MEPCO 12H STIMULATION INFORMATION

Stage Number	Report Date	Avg Treating Rate (BPM)	Avg Treating Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Total Proppant Amount (lbs)	Flush Volume (bbbls)	Total Clean Fluid (Bbbls)	Pad Volume (bbbls)
1	10/8/18	80	7,916	6,918	6,807	303,240	388	6,564	551
2	10/9/18	79	8,264	6,981	5,324	348,400	378	7,561	422
3	10/9/18	80	8,571	6,619	5,526	351,060	379	7,315	429
4	10/9/18	80	9,076	7,067	5,702	350,120	370	7,457	253
5	10/10/18	80	9,050	7,038	5,582	357,260	383	7,553	418
6	10/10/18	78	8,811	6,876	5,178	352,970	367	7,470	429
7	10/10/18	80	8,887	6,468	5,228	351,980	365	7,602	456
8	10/10/18	80	8,863	6,504	5,588	351,240	360	7,470	328
9	10/11/18	80	9,019	7,132	5,579	349,250	350	7,389	330
10	10/11/18	79	9,185	6,595	5,725	289,520	349	6,612	430
11	10/11/18	77	8,990	6,767	5,101	351,280	345	7,475	429
12	10/11/18	75	8,936	6,919	6,087	298,260	339	6,802	377
13	10/12/18	80	8,931	6,968	6,282	349,630	337	6,864	285
14	10/12/18	78	9,005	7,283	5,743	296,930	333	7,449	430
15	10/12/18	80	8,804	6,912	5,306	350,740	330	7,554	428
16	10/13/18	79	8,762	7,492	5,915	357,600	323	7,792	372
17	10/13/18	74	8,997	7,295	5,319	236,940	311	5,667	345
18	10/13/18	77	8,582	7,528	5,851	351,000	311	7,509	429
19	10/13/18	80	8,484	6,950	5,954	351,260	315	7,089	231
20	10/14/18	79	8,573	7,559	5,957	350,340	307	7,139	206
21	10/14/18	78	8,681	7,103	5,481	318,480	300	7,023	429
22	10/14/18	79	8,315	6,815	5,817	349,330	291	7,412	429
23	10/15/18	80	8,519	6,780	1	343,200	297	7,325	334
24	10/15/18	76	8,733	7,559	5,316	282,860	284	8,038	429
25	10/15/18	75	8,418	7,396	5,346	351,010	280	7,471	429
26	10/15/18	78	8,502	7,166	5,650	350,600	275	7,248	225
27	10/16/18	79	8,656	7,226	5,524	349,160	270	7,121	145
28	10/16/18	75	8,298	6,822	5,528	350,480	270	7,307	429
29	10/16/18	78	8,535	7,280	5,824	352,680	265	7,298	150
30	10/17/18	77	8,692	7,281	5,692	305,440	260	6,720	165
31	10/17/18	76	8,144	7,021	6,064	351,200	253	7,741	429
32	10/17/18	80	8,283	6,999	5,426	350,200	250	7,205	429
33	10/17/18	79	8,175	7,342	5,543	352,100	245	7,187	150
34	10/18/18	79	8,238	6,983	6,135	355,440	239	7,361	150
35	10/18/18	79	7,891	7,301	5,632	350,080	243	7,417	429
36	10/18/18	78	7,937	7,042	5,708	350,550	241	7,544	428
37	10/18/18	77	8,210	7,047	5,809	350,410	220	8,347	150
38	10/19/18	80	8,009	7,101	5,559	351,320	223	7,171	200
39	10/19/18	79	8,367	7,182	5,250	327,240	235	7,228	428
40	10/19/18	78	8,039	6,967	5,203	349,740	212	7,998	430
41	10/19/18	78	7,860	7,902	5,338	350,310	210	7,124	150

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MEPCO 12H PERFORATION RECORD				
Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	10/8/18	-	17,436	0
2	10/9/18	17,144	17,302	40
3	10/9/18	16,943	17,102	40
4	10/9/18	16,743	16,901	40
5	10/10/18	16,543	16,701	40
6	10/10/18	16,342	16,501	40
7	10/10/18	16,142	16,300	40
8	10/10/18	15,941	16,100	40
9	10/11/18	15,741	15,899	40
10	10/11/18	15,541	15,699	40
11	10/11/18	15,340	15,499	40
12	10/11/18	15,140	15,298	40
13	10/12/18	14,939	15,098	40
14	10/12/18	14,739	14,897	40
15	10/12/18	14,539	14,697	40
16	10/13/18	14,338	14,497	40
17	10/13/18	14,138	14,296	40
18	10/13/18	13,937	14,096	40
19	10/13/18	13,737	13,895	40
20	10/14/18	13,537	13,695	40
21	10/14/18	13,336	13,494	40
22	10/14/18	13,136	13,294	40
23	10/15/18	12,935	13,094	40
24	10/15/18	12,735	12,893	40
25	10/15/18	12,535	12,693	40
26	10/15/18	12,334	12,492	40
27	10/16/18	12,134	12,292	40
28	10/16/18	11,933	12,092	40
29	10/16/18	11,733	11,891	40
30	10/17/18	11,532	11,691	40
31	10/17/18	11,332	11,490	40
32	10/17/18	11,132	11,290	40
33	10/17/18	10,931	11,090	40
34	10/18/18	10,731	10,889	40
35	10/18/18	10,530	10,689	40
36	10/18/18	10,330	10,488	40
37	10/18/18	10,130	10,288	40
38	10/19/18	9,929	10,088	40
39	10/19/18	9,729	9,887	40
40	10/19/18	9,528	9,687	40
41	10/19/18	9,328	9,486	40

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Cement Job Log

Customer: NORTHEAST NATURAL ENERGY LLC	Date: 5/31/2018	Serv. Supervisor: David Thorne
Cust. Rep.:	Ticket #: JWV1805-0030	Serv. Center: Jane Lew, WV
Lease: Mepco 12H	API Well #:	County: Monongalia State: West Virginia
Well Type:	Rig: Patterson 334	Type of Job: Production Casing

Materials Furnished by C&J ENERGY SERVICES

Plugs	Casing Hardware	Physical Slurry Properties					
		Sacks of Cement	Fluid Dens (lb/gal)	Yield (cuft/sk)	Mix Water (gal/sk)	Fluid Volume (bbbls)	Mix Water (bbbls)
Spacer 1: CJ810 PureScrub Spacer + 1 gal/bbl CPC35		-	13.5			100	
Lead							
Tail: 50:50 CJ010:CJ910 + 3% CJ111 (BWOW) + 0.25% CJ210F + 0.2% CJ500U + 0.2% CJX157011		3260	14.5	1.17	4.95	680	384

Displacement Chemicals:

OPEN HOLE DATA			TUBULAR DATA									
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSG/TBG/DP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)	
8 3/4		6212	Casing	5 1/2	20		17515		4.79			
8 1/2		17515										

PREVIOUS CASING DATA				PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
SIZE (in)	WEIGHT (lbs/ft)	ID (in)	DEPTH (ft)	TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP
9 5/8	40	8.84	2443					17515	17435		

WELL FLUID		DISPLACEMENT FLUID (STG 1)		DISPLACEMENT FLUID (STG 2)			WATER ON LOC (bbl)	DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)
TYPE	DENSITY	VOLUME	TYPE	DENSITY	VOLUME	TYPE				
Mud	12.3	387 bbl	Water	8.3 ppg			2000	3144	6536	

Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details
7:00 AM						0	Arrived On Location
7:00 AM						0	Rigged Up(waited on casing)
12:00 PM						0	Safety Meeting
12:30 PM		6000				0	Psi Test
12:35PM	3	870				0	Launched Plug
12:40 PM	8	943			100	100	Spacer
01:00PM	8	1200			679	779	Slurry (Top of cement 1185)
01:35PM	8	2060				779	Plug Ruptured 300 bbbls into cement
02:25PM						779	SD WL DP
2:30 PM	8	3600			387	1166	Disp(45 bbbls spacer back)
03:45PM	4	4100				1166	Plug Landed
04:00PM						1166	Released Psi (5.5 bbbls back)
04:03PM		4100				1166	Bumped Back Up On Plug (per company rep)
04:08PM						1166	Released Psi
06:00PM						1166	Washed Up Rigged Down
						1166	
						1166	
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Left Yard						Left Loc.			Start Pump	
Arrived Loc.						Returned Yd			End Pump	
Bumped Plug (psi)	Final Differential (psi)	Floats Held (Y/N)	PSI Left on Casing	Cement to Surface (bbl)	Full Circ. During Job (Y/N)	Max Pump Pressure (psi)	Standby Charged (hrs)	David Thorne		
Yes	3600	Yes			Yes			Service Supervisor		

NORTHEAST NATURAL ENERGY, LLC

Location: Monongalia County, WV
 Field: Monongalia
 Facility: MEPCO Pad

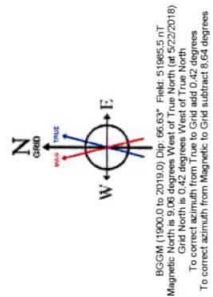
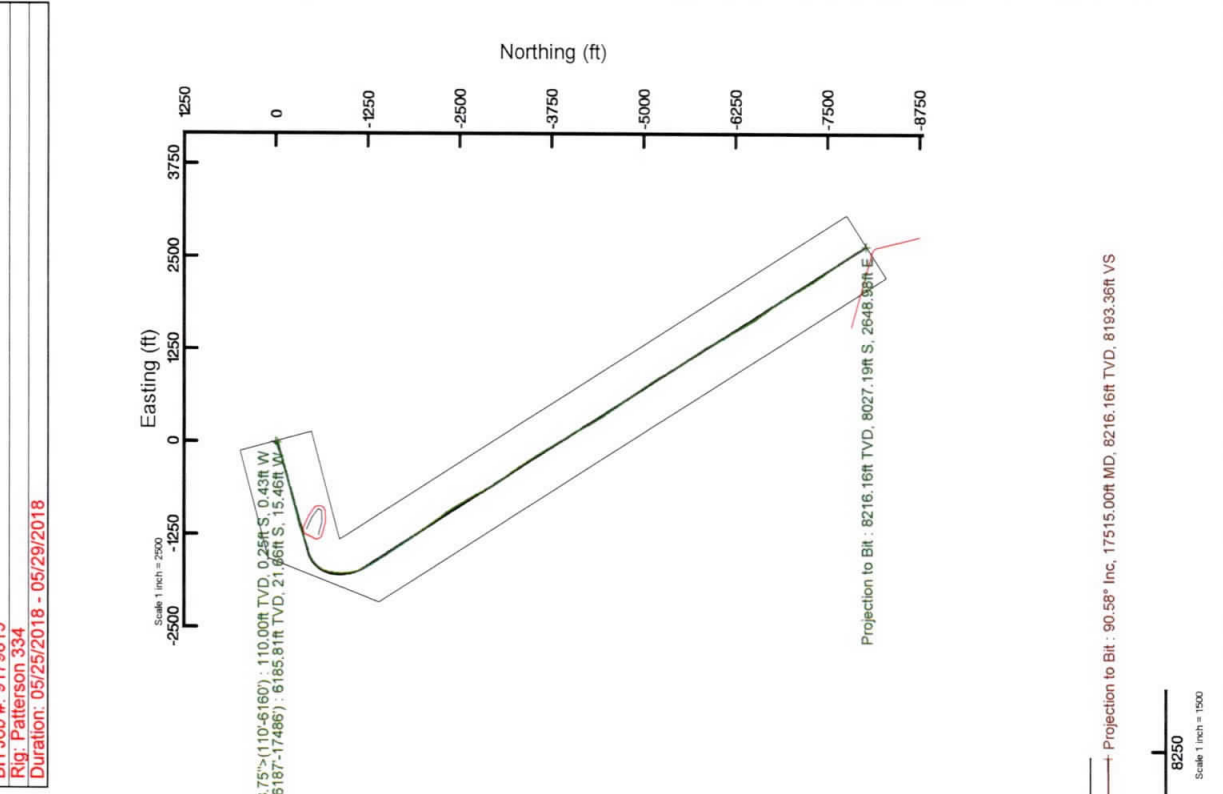
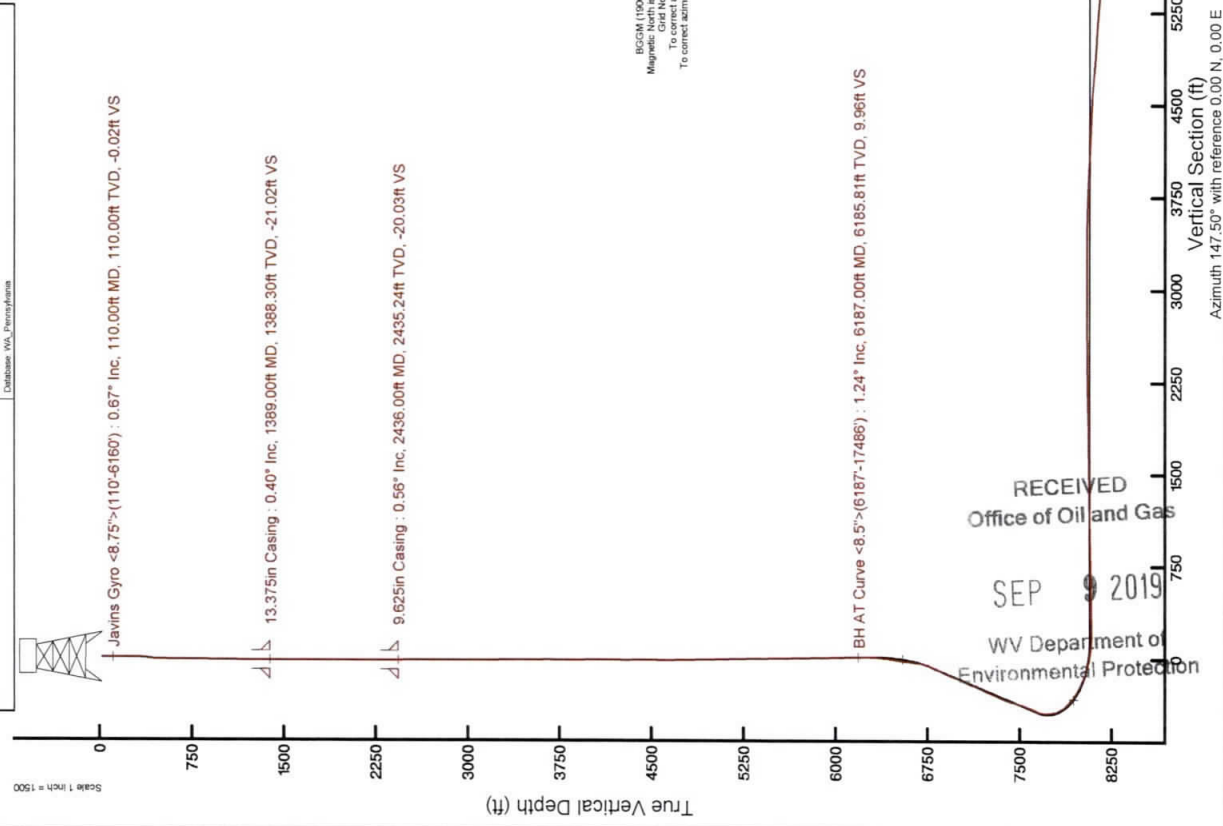
Slot: Slot #12
 Well: MEPCO LLC 12H
 Wellbore: MEPCO LLC 12H PWB

Grid System: NAD83 / Lambert West Virginia SP Northern Zone (6703), US feet
 True vertical depths are referenced to Patterson 334 (KB)
 Measured depths are referenced to Patterson 334 (KB)
 Patterson 334 (KB) to Mean Sea Level: 1449 feet
 Mean Sea Level to Ground level (At Slot, Slot #12): -1474 feet
 Coordinates are in feet referenced to Slot
 Database: WA, Pennsylvania

Location Information			
Facility Name	Grid East (US ft)	Grid North (US ft)	Longitude
MEPCO Pad	1784821.230	424282.090	80°09'08.866" W
Local N (ft)	Local E (ft)	Grid North (US ft)	Longitude
-103.38	56.57	39°39'45.944" N	80°09'08.133" W
Slot #12	1784877.800	424178.720	
Patterson 334 (KB) to Ground level (At Slot, Slot #12)			25ft
Mean Sea Level to Ground level (At Slot, Slot #12)			-1474ft
Patterson 334 (KB) to Mean Sea Level			1449ft

Comments

API: 47-061-01789-0000
 BH Job #: 9179815
 Rig: Patterson 334
 Duration: 05/25/2018 - 05/29/2018

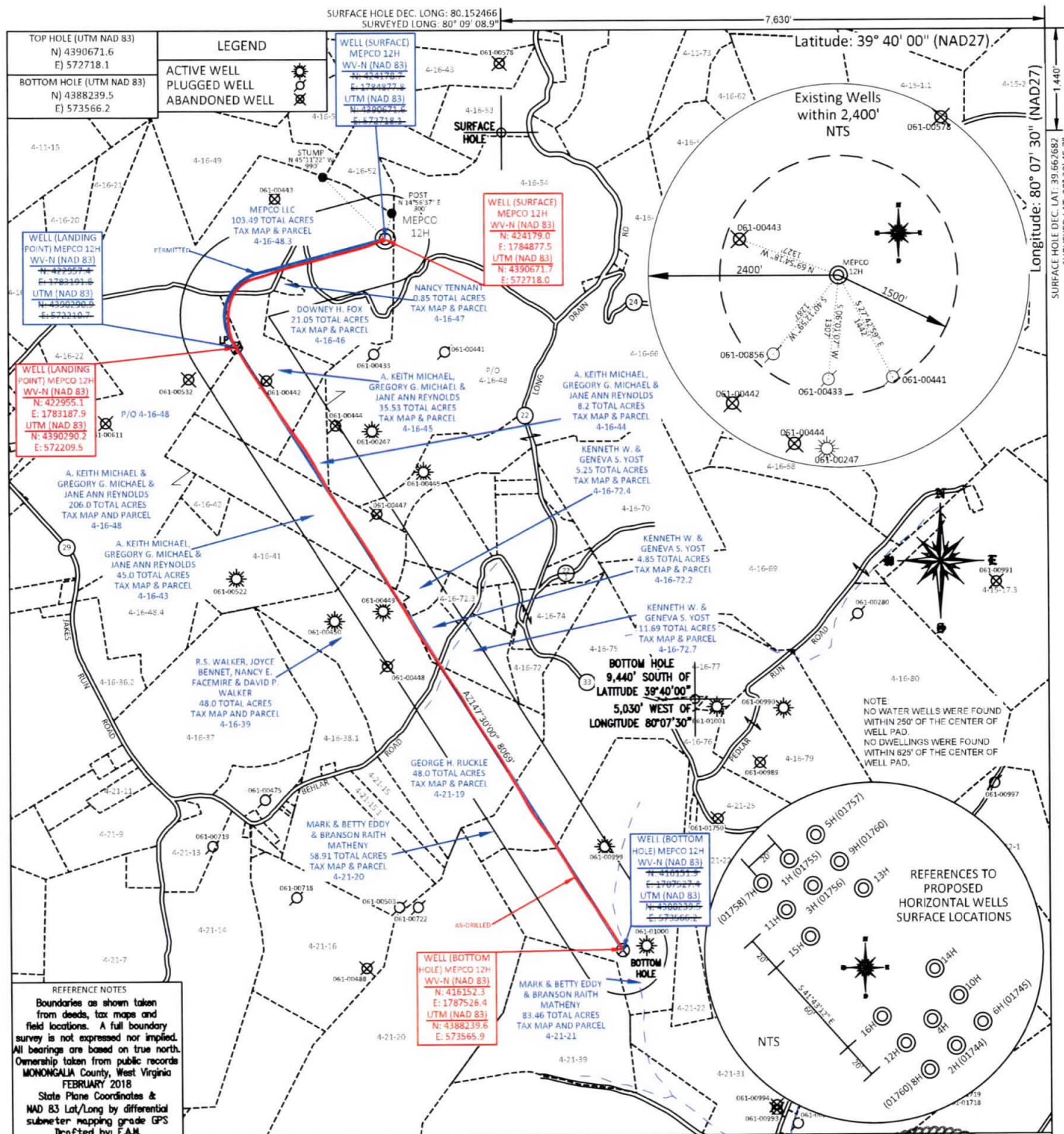


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Scale 1 inch = 1500

Vertical Section (ft)
 Azimuth 147.50° with reference 0.00 N, 0.00 E

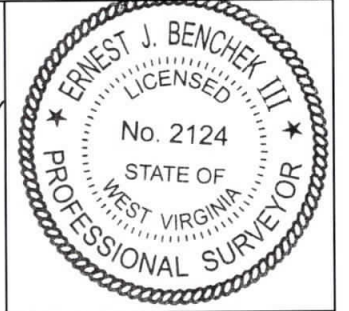
Scale 1 inch = 1500



FILE #: NNE16
 DRAWING #: 2932
 SCALE: PLAT: 1" = 1600'
TICK: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/200
 PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: [Signature]
 L.L.S. #2124 : Ernest J. Benchek III



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WYDEP

OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304

Well Type: Oil Waste Diposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: DUNKARD CREEK
 COUNTY/DISTRICT: MONONGALIA / CLAY
 SURFACE OWNER: MEPCO LLC
 OIL & GAS ROYALTY OWNER: NNE LLC ET AL
 LEASE NUMBERS: _____

DATE: AUGUST 5, 2019
 OPERATOR'S WELL #: MEPCO 12H (AS-DRILLED)
 API WELL #: 47 61 Office of Oil and Gas
 STATE COUNTY PERMIT

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AS-BUILT ELEVATION: 1,420.20'
 QUADRANGLE: BLACKSBURG
 ACREAGE: 103.49 +/-
 ACREAGE: 740.73 +/-

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 8,222' TMD: 17,597.43'
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC DESIGNATED AGENT: JOHN ADAMS
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301 CITY: CHARLESTON STATE: WV ZIP CODE: 25301