

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

API 47 - 061 - 01744 County Monongalia District Clay
Quad Blacksville Pad Name MEPCO Field/Pool Name _____
Farm name MEPCO, LLC Well Number MEPCO 2H
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 4390671.2 Easting 572726.8
Landing Point of Curve Northing 4390398.5 Easting 572591.9
Bottom Hole Northing 4388374.7 Easting 573927.2

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 12/22/2017 Date drilling ceased 4/29/2018
Date completion activities began 9/13/2018 Date completion activities ceased 9/24/2018
Verbal plugging (Y/N) NA Date permission granted NA Granted by NA

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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug
Freshwater depth(s) ft 906' Open mine(s) (Y/N) depths N
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:
MDK 10/28/2019

API 47-061 - 01744

Farm name MEPCO, LLC

Well number MEPCO 2H

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	NA	N/A	Grouted In
Surface	17-1/2"	13-3/8"	1,400	N	54.6	N/A	Y, 48 bbl
Coal							
Intermediate 1	12-1/4"	9-5/8"	2,457	N	40	N/A	Y, 17 bbl
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	16,602	N	20	N/A	N
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	-	-	3 Yds	-	-	-
Surface	Class A + 2%	1,090	15.6	1.20	1308	CTS	8
Coal							
Intermediate 1	Class A + 1%	800	15.6	1.19	1309	CTS	8
Intermediate 2							
Intermediate 3							
Production	50:50 Class A + Additives	3,190	14.5	1.17	3736	2,300'	48
Tubing							

Drillers TD (ft) 16,619'

Loggers TD (ft) 16,589'

Deepest formation penetrated Marcellus

Plug back to (ft) NA

Plug back procedure NA

Kick off depth (ft) 2,785'

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

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

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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	7770	7830	Tully
Hamilton	7830	7890	Hamilton
Marcellus	7890	8082	Marcellus
Onondaga	8082	8114	Onondaga
Huntersville chert	8114		Huntersville chert

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MEPCO 2H STIMULATION INFORMATION

Stage Number	Report Date	Avg Treating Rate	Avg Treating Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Total Proppant Amount (lbs)	Flush Volume (bbls)	Total Clean Fluid (Bbls)	Pad Volume (bbls)
1	9/13/2018	81	8,268	5,306	5,723	296,820	371	6,451	460
2	9/13/2018	80	8,379	7,146	5,243	354,346	365	7,699	429
3	9/14/2018	79	9,088	7,562	5,000	350,740	362	7,622	378
4	9/14/2018	76	8,969	7,330	5,741	350,540	355	7,836	428
5	9/14/2018	79	8,802	7,093	5,674	308,620	348	7,149	429
6	9/15/2018	80	8,877	6,917	5,603	350,900	349	7,488	402
7	9/15/2018	80	8,985	7,182	6,040	350,424	340	7,422	329
8	9/15/2018	79	8,967	6,872	4,922	350,000	348	7,513	429
9	9/16/2018	78	8,933	7,292	5,205	296,210	348	8,369	429
10	9/16/2018	78	8,982	7,545	5,361	349,400	324	7,368	355
11	9/16/2018	75	8,868	7,179	4,954	351,740	322	7,935	429
12	9/17/2018	76	8,624	7,682	5,372	350,420	317	7,483	429
13	9/17/2018	79	8,607	7,013	5,258	350,960	311	7,226	270
14	9/17/2018	80	8,403	6,650	5,433	351,970	319	7,521	429
15	9/18/2018	81	8,481	6,737	5,251	350,600	309	7,321	428
16	9/18/2018	80	8,684	6,717	5,345	356,800	302	7,419	341
17	9/18/2018	81	8,432	6,350	5,372	350,700	297	7,270	210
18	9/18/2018	76	8,560	6,838	5,484	351,020	297	7,109	429
19	9/19/2018	80	8,858	6,712	5,589	346,700	284	7,366	315
20	9/19/2018	78	8,728	6,708	5,197	350,920	283	7,583	278
21	9/19/2018	75	8,626	7,309	5,295	351,500	278	7,235	429
22	9/20/2018	77	8,754	7,169	5,506	349,553	278	7,188	428
23	9/20/2018	81	8,562	7,007	5,380	351,143	269	7,117	429
24	9/20/2018	79	8,461	6,785	5,631	338,670	268	6,875	429
25	9/21/2018	79	8,293	6,543	4,952	349,880	263	7,906	630
26	9/21/2018	81	8,123	6,486	5,655	344,160	258	7,130	436
27	9/21/2018	80	8,118	6,352	5,231	349,800	254	7,277	425
28	9/21/2018	80	8,105	6,475	5,079	350,420	248	6,900	429
29	9/22/2018	79	8,202	6,794	5,125	350,680	245	7,092	429
30	9/22/2018	80	8,018	6,543	5,486	349,620	241	7,133	429
31	9/22/2018	80	8,092	7,011	5,288	350,140	232	7,071	429
32	9/22/2018	79	8,020	6,508	5,206	353,080	237	7,225	430
33	9/23/2018	78	7,936	6,965	5,335	353,240	232	7,746	429
34	9/23/2018	80	7,993	6,586	5,251	351,220	220	7,123	429
35	9/23/2018	81	7,839	6,878	5,436	347,060	217	7,026	429
36	9/23/2018	77	7,988	6,761	5,813	320,970	214	7,071	700
37	9/24/2018	79	7,671	6,243	5,800	345,420	211	8,057	429
38	9/24/2018	80	7,888	7,366	5,165	350,820	204	7,151	429
39	9/24/2018	80	8,160	6,977	5,169	294,380	196	6,438	428
40	9/24/2018	81	7,680	6,328	5,288	350,840	199	7,467	689

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MEPCO 2H PERFORATION RECORD				
Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	9/13/2018	-	16,554	-
2	9/13/2018	16,259	16,416	40
3	9/14/2018	16,059	16,217	40
4	9/14/2018	15,860	16,018	40
5	9/14/2018	15,661	15,818	40
6	9/15/2018	15,461	15,619	40
7	9/15/2018	15,262	15,419	40
8	9/15/2018	-	15,220	40
9	9/16/2018	14,863	15,021	40
10	9/16/2018	14,664	14,821	40
11	9/16/2018	14,464	14,622	40
12	9/17/2018	14,265	14,423	40
13	9/17/2018	14,066	14,223	40
14	9/17/2018	-	14,024	40
15	9/18/2018	13,667	13,825	40
16	9/18/2018	13,468	13,625	40
17	9/18/2018	13,268	13,426	40
18	9/18/2018	13,069	13,226	40
19	9/19/2018	12,870	13,027	40
20	9/19/2018	12,670	12,828	40
21	9/19/2018	12,471	12,628	40
22	9/20/2018	12,272	12,429	40
23	9/20/2018	12,072	12,230	40
24	9/20/2018	11,873	12,031	40
25	9/21/2018	11,673	11,831	40
26	9/21/2018	11,474	11,632	40
27	9/21/2018	11,275	11,432	40
28	9/21/2018	11,075	11,233	40
29	9/22/2018	10,876	11,033	40
30	9/22/2018	10,677	10,834	40
31	9/22/2018	10,477	10,635	40
32	9/22/2018	10,278	10,435	40
33	9/23/2018	10,079	10,236	40
34	9/23/2018	9,879	10,037	40
35	9/23/2018	9,680	9,837	40
36	9/23/2018	9,480	9,638	40
37	9/24/2018	9,281	9,439	40
38	9/24/2018	9,082	9,239	40
39	9/24/2018	8,882	9,040	40
40	9/24/2018	8,683	8,841	40

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NORTHEAST NATURAL ENERGY, LLC

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

Slot: Slot #02
 Well: MEPCO LLC 2H
 Wellbore: MEPCO LLC 2H PWB

Grid System: NAD83 (Latest Vers. Virginia SP, Indiana Zone NAD83, US Feet)
 * True North was transformed from different geoid datum
 North Reference: Grid North
 Scale: True distance
 Patterson 334 (KB) to Mean Sea Level: 1449 ft
 Mean Sea Level to Ground level (At Slot, Slot #02): 25 ft
 Coordinates are in feet referenced to M

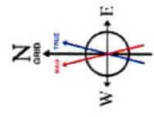
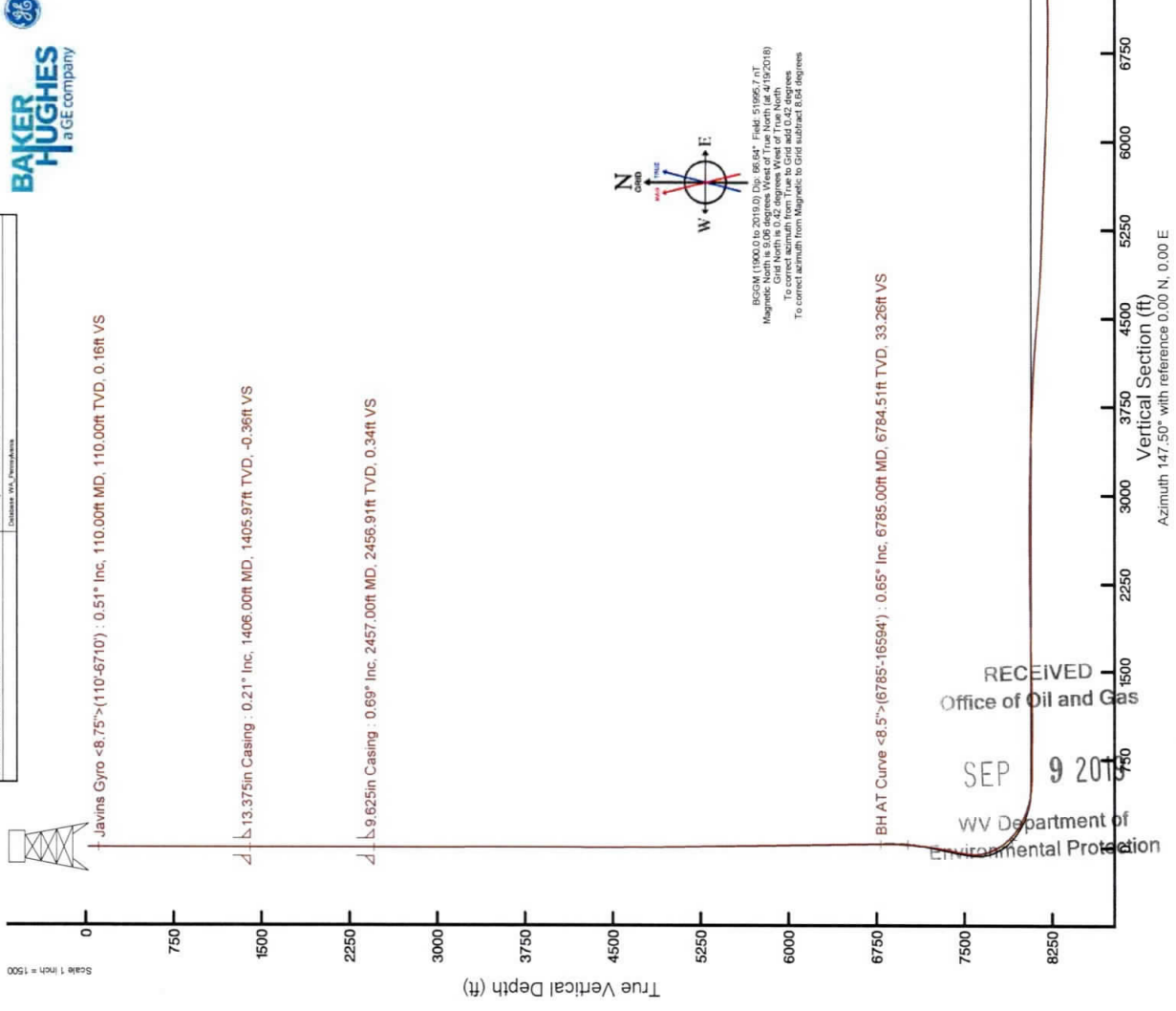
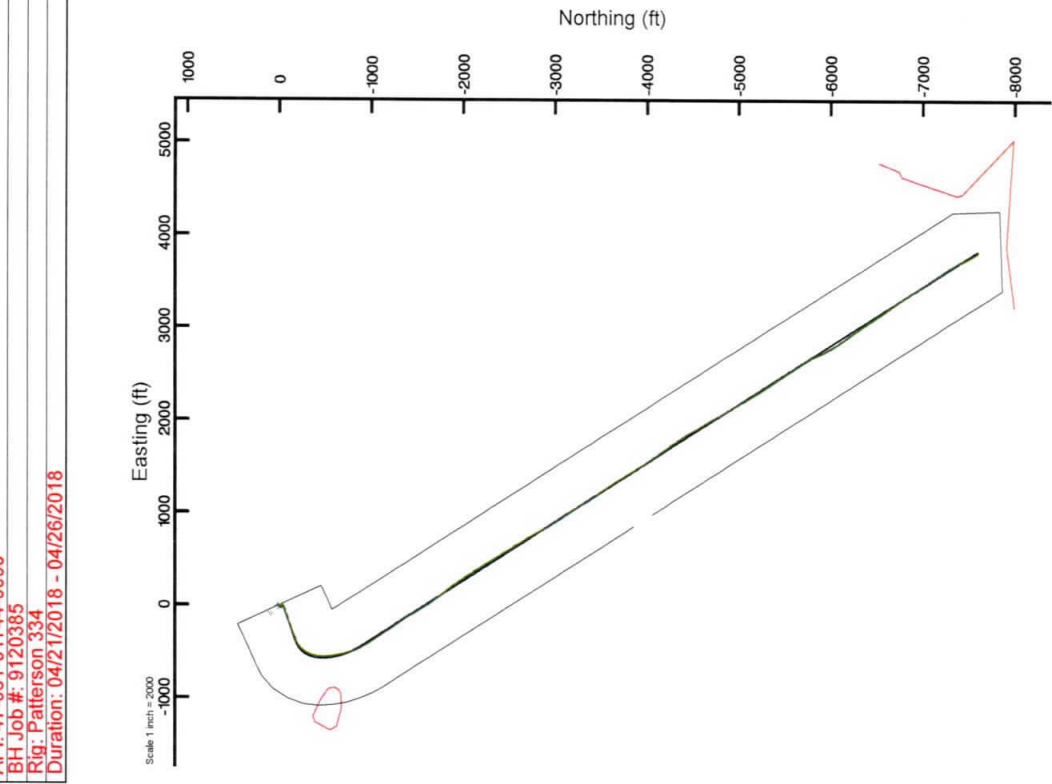


Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
MEPCO Pad	1784821.230	424282.090	39°39'46.962"N	80°09'09.866"W
Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude
105.00	84.82	1784906.040	424177.100	39°39'45.930"N
Slot #02				80°09'07.771"W
Patterson 334 (KB) to Ground level (At Slot, Slot #02): 25 ft				
Mean Sea Level to Ground level (At Slot, Slot #02): 1449 ft				

Comments

API: 47-061-01744-0000
 BH Job #: 9120385
 Rig: Patterson 334
 Duration: 04/21/2018 - 04/26/2018



ESGM (1983.0 to 2018.0) DTM 66687 Field 61866 7 FT
 Magnetic Grid North (used 04/2018)
 Magnetic Grid North is 0.42 degrees West of True North
 To correct azimuth from True to Grid add 0.42 degrees
 To correct azimuth from Magnetic to Grid subtract 0.04 degrees

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BH Projection: 91.11° Inc, 16619.00ft MD, 8201.36ft TVD, 8460.03ft VS
 5.5in Casing Production: 91.11° Inc, 16619.00ft MD, 8201.36ft TVD, 8460.03ft VS

Scale 1 inch = 1500
 Azimuth 147.50° with reference 0.00 N, 0.00 E

Primary Cementing Proposal

NORTHEAST NATURAL ENERGY LLC

Mepco 2H

5 1/2 IN PRODUCTION CASING

Well Location

County: *Monongalia*
 State: *West Virginia*

Rig Name: **Patterson 334**

Water Estimates

Spacer: 58.3 [bbls]
 Total Mix Water: 376.1 [bbls]
 Displacement: 368.7 [bbls]
 Wash up: 30.0 [bbls]

Total Water Estimate: 833.1 [bbls]

Well Information

Casing Size: 5 1/2 [in]
 Casing Depth: 16602 [ft]
 TVD: 8100 [ft]
 O.H. 1 Size: 8 3/4 [in]
 O.H. 1 Depth: 6825 [ft]
 O.H. 2: 8 1/2 [in]

Pvs.Casing Size: 9 5/8 [in]
 Pvs. Casing Depth: 2457 [ft]
 BHST: 157 [°F]
 BHCT: 145 [°F]

Prepared For: *Jay Hewitt*

Date Prepared: 4/27/18

Prepared By: *Neal Johnson*

Phone: 830-480-7327

Fax: 304-884-6687

Email: neal.johnson@cjes.com

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NORTHEAST NATURAL ENERGY LLC

Mepco 2H

5 1/2 IN PRODUCTION CASING

Well Bore Information

Drilling Fluid 12.5 ppg Synthetic Based Drilling Fluid
 Spacers

Previous Casing Depth:
 2457 [ft]

Casing in Casing Factor:
 0.2609 [cuft/ft]



Total Annular Excess
 10.0%

Casing in OH1 Factor:
 0.2526 [cuft/ft]
 (Without Excess)

Casing in OH2 Factor
 0.2291 [cuft/ft]
 (Without Excess)

Casing Capacity Factor:
 0.1253 [cuft/ft]

Tail Cement

Top: 2300 [ft]
 Fill: 14302 [ft]
 Excess: 10 %
 Vol: 3736 [cuft]

Shoe Track Length
 80 [ft]

Measured Depth

16,602 [ft]

Note: Drawing may not be 100%
 Accurate with different situations.

Displacement Volume: 369 [bbbls]

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NORTHEAST NATURAL ENERGY LLC

Mepco 2H

5 1/2 IN PRODUCTION CASING

Mud / Cement Spacer System:

100 bbls CJ810 PureScrub Spacer + 1 gal/bbl CPC35 @ 13.5 [lb/gal]

No Lead System

Tail System

3190 sks = 665.3 bbls

50:50 CJ010:CJ910 + 3% CJ111 (BWOW) + 0.25% CJ210F + 0.2% CJ500U + 0.2% CJX157011

Mix Weight: 14.50 [lb/gal]

Yield: 1.17 [cuft/sk]

Mix Water: 4.95 [gal/sk]

Displacement Fluid

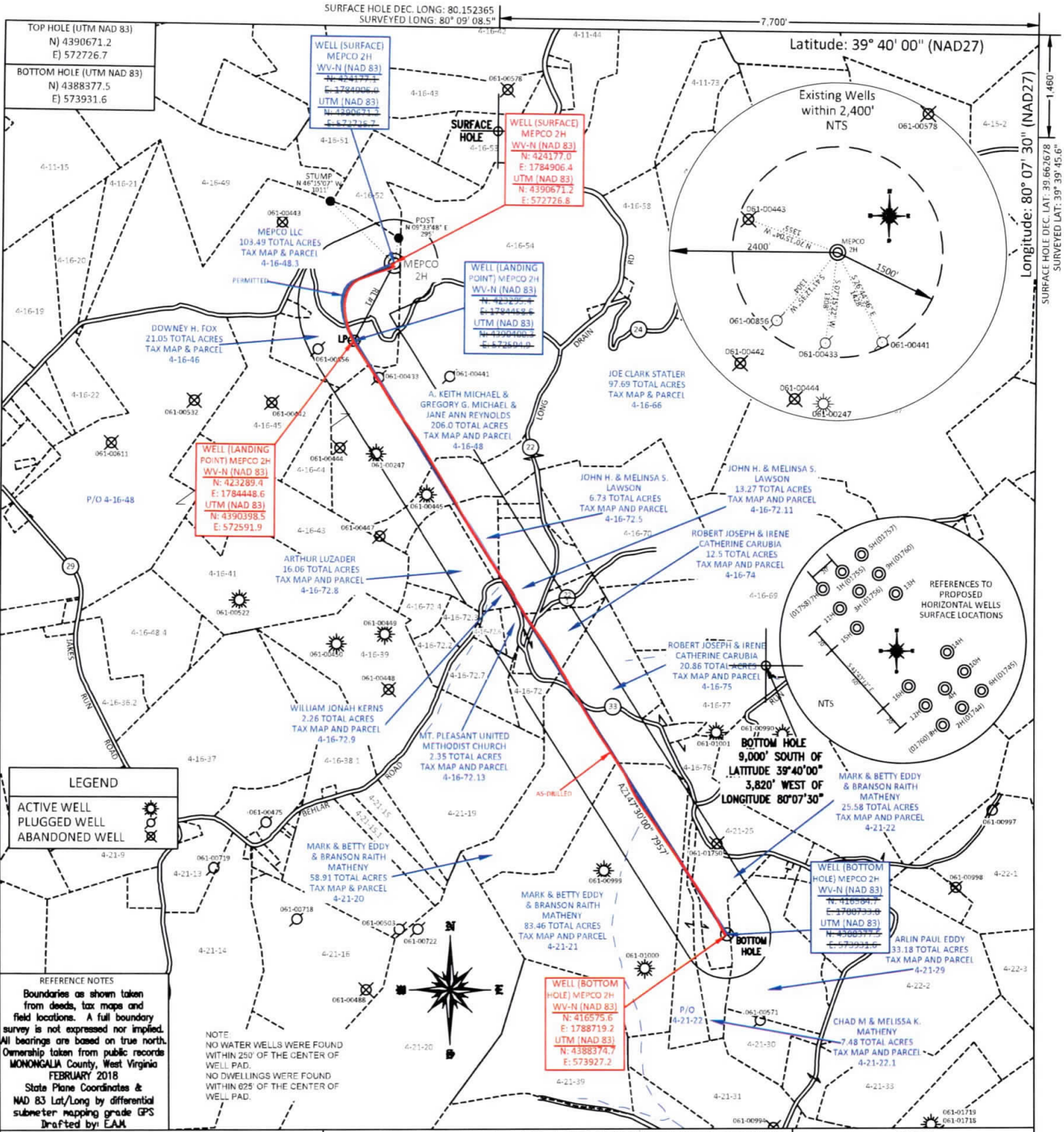
369 bbls of Water

Always refigure on location!!!!

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FILE #: NNE16
 DRAWING #: 2923
 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 WVDEP

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

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

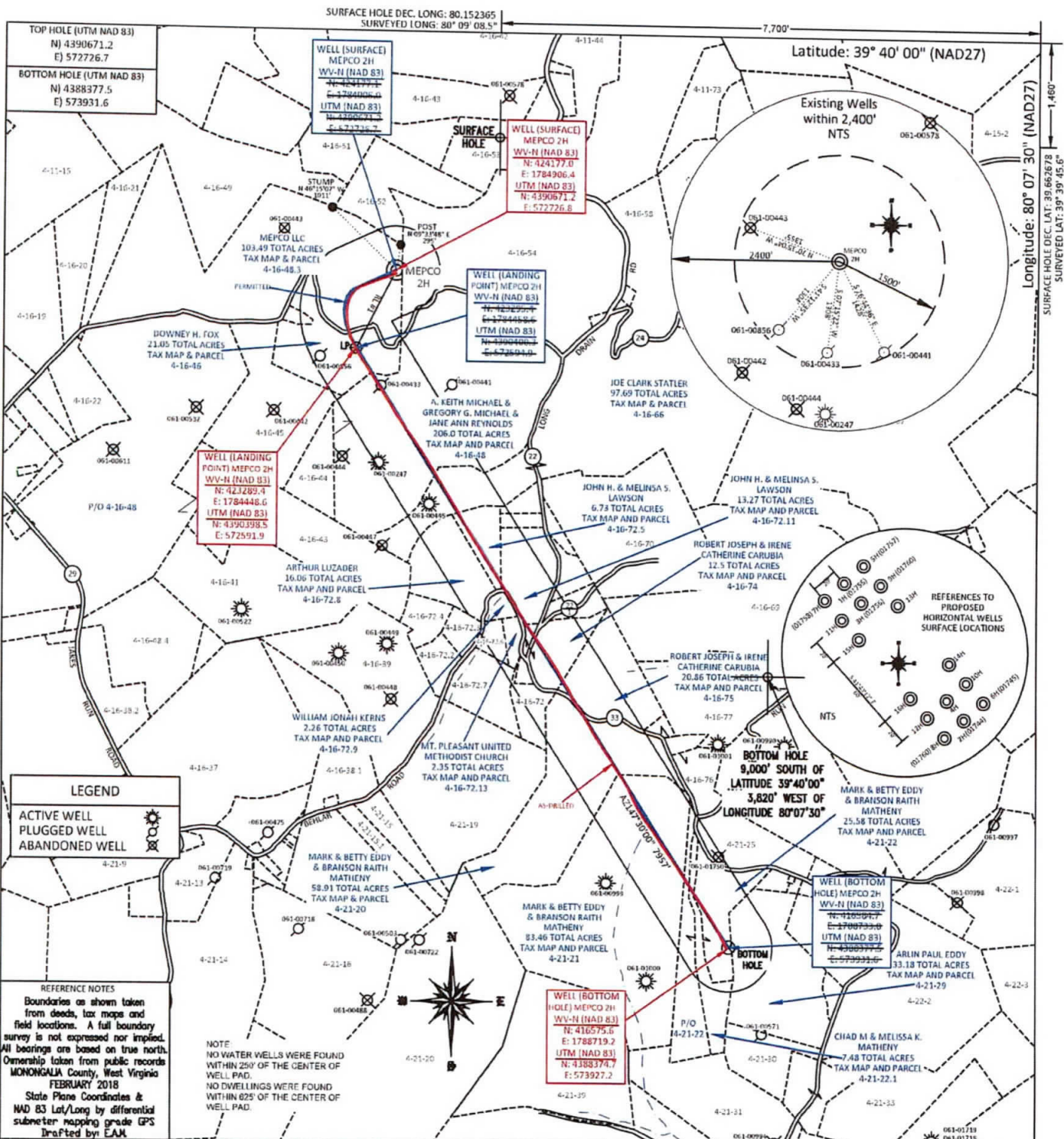
WATERSHED: DUNKARD CREEK
 COUNTY/DISTRICT: MONONGALIA / CLAY
 SURFACE OWNER: MEPCO LLC
 OIL & GAS ROYALTY OWNER: NNE LLC ET AL
 LEASE NUMBERS:

DATE: AUGUST 5, 2019
 OPERATOR'S WELL #: MEPCO 2H (AS-DRILLED)
 API WELL #: 47 STATE 61 COUNTY 01744 PERMIT

AS-BUILT ELEVATION: 1,420.20'
 QUADRANGLE: BLACKSVILLE and Gas
 ACREAGE: 103.49 +/-
 ACREAGE: 601.71 +/- 9 2019

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

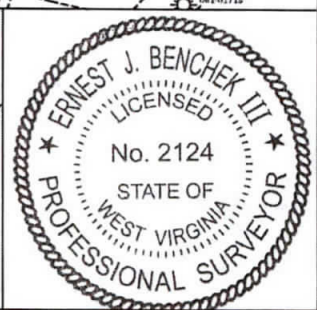
TARGET FORMATION: MARCELLUS
 ESTIMATED DEPTH: TVD: 8,222' TMD: 16,761.43'
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301
 DESIGNATED AGENT: JOHN ADAMS
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301



FILE #: NNE16
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 WYDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304

Well Type: Oil Waste Disposal 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 2H (AS-DRILLED)
 API WELL #: 47 61 01744
 STATE COUNTY PERMIT

AS-BUILT ELEVATION: 1,420.20'
 QUADRANGLE: BLACKSVILLE
 ACREAGE: 103.49 +/-
 ACREAGE: 601.71 +/-

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: 16,761.43'
 WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC
 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
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