

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

API 47 - 061 - 01739 County Monongalia District Clay
Quad Blacksville Pad Name Fisher Field/Pool Name _____
Farm name Aaron K. Fisher Well Number 13H
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 4394366.7 Easting 567427.9
Landing Point of Curve Northing 4394783.5 Easting 567714.6
Bottom Hole Northing 4396715.0 Easting 566212.4

Elevation (ft) 1,453' 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 12/07/15 Date drilling commenced 01/02/17 Date drilling ceased 03/08/17

Date completion activities began 07/04/17 Date completion activities ceased 07/17/17

Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

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

Freshwater depth(s) ft 1,352' Open mine(s) (Y/N) depths N

Salt water depth(s) ft 2,500' Void(s) encountered (Y/N) depths N

Coal depth(s) ft 350';1,930' Cavern(s) encountered (Y/N) depths N

Is coal being mined in area (Y/N) N

Reviewed

Reviewed by: [Signature]
07/20/2018
6/11/2018

API 47-061 - 01739 Farm name Aaron K. Fisher Well number 13H

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	94.71	N/A	Grouted In
Surface	17-1/2"	13-3/8"	1,428'	N	54.5	N/A	Y 25 bbl
Coal							
Intermediate 1	12-1/4"	9-5/8"	2,624'	N	40	N/A	Y 2 bbl
Intermediate 2							
Intermediate 3							
Production	8-3/4"	5-1/2"	17,235'	N	20	N/A	N, EST. 1,624'
Tubing	N/A	2-7/8"	N/A	N	6.5	N/A	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%	1,146	15.6	1.19	1,369.958	Surface	8
Coal							
Intermediate 1	Class A + 1%	871	15.6	1.19	1,033.083	Surface	8
Intermediate 2							
Intermediate 3							
Production	50:50 + Additives	3,450	14.5	1.18	4,064.958	1,624'	48
Tubing							

Drillers TD (ft) 17,252' Loggers TD (ft) 17,222'
 Deepest formation penetrated Marcellus Plug back to (ft) _____
 Plug back procedure _____

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Kick off depth (ft) 6,335'

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 _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

API 47- 061 - 01739 Farm name Aaron K. Fisher Well number 13H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
			Please	See	Attachment

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
						Please	See	Attachment

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Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS		
Marcellus	8,267.11'	TVD	17,252' MD

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3520 psi Bottom Hole _____ psi DURATION OF TEST 48 hrs

OPEN FLOW Gas 4984 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 Nabors
Address 82 Old Elkins Rd. City Buckhannon State WV Zip 26201

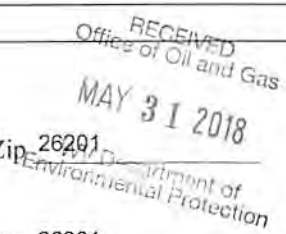
Logging Company Baker Hughes
Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Cementing Company C&J Energy Services
Address 380 Southpoint Blvd #210 City Canonsburg State PA Zip 15317

Stimulating Company BJ Services
Address 1036 E. Main St. City Bridgeport State WV Zip 26330

Please insert additional pages as applicable.

Completed by Hollie Medley Telephone 304-212-0422
Signature *Hollie Medley* Title Regulatory Manager Date 5-29-18



Customer: NORTHEAST NATURAL ENERGY LLC		Date:		Serv. Supervisor: David Thorne							
Cust. Rep.:		Ticket #: JWV1701-0003		Serv. Center: Jane Lew, WV							
Lease: Fisher 13H		API Well #:		County: Monongalia State: West Virginia							
Well Type:		Rig: US Energy 9-1		Type of Job: Surface 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 (bbls)	Mix Water (bbls)		
Spacer 1:	6% Gel			-	8.7			25			
Spacer 2:				-							
Scavenger											
Lead											
Tail:	CJ910 + 2% CJ110 + 0.25 LB/SK CJ600			1146	15.6	1.19	5.20	244	142		
Displacement Chemicals:											
OPEN HOLE DATA			TUBULAR DATA								
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSO/BO/OP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
17 1/2		1430	Casing	13 3/8	54.5		1428		12.61		
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
24	94.5	23.27							1388		
WELL FLUID		DISPLACEMENT FLUID			DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)	WATER ON LOC (bbl)			
TYPE	DENSITY	VOLUME	TYPE	DENSITY				2000			
dirty	8.7 ppg	215 bbl	water	8.3 ppg	335						
Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details				
0400pm							0 Arrived On Location				
0410pm							0 rigged up				
0445pm							0 safety meeting				
0500pm							0 washing casing down				
0640pm					250	250	250 PSI Test				
0645pm	7	225			25	275	Gel				
0650pm	7	300			10	285	water				
0655pm	6	350			242	527	Slurry				
0730pm						527	SD DP				
0735pm	8	540			215	742	Disp				
0800pm	3	1040				742	Plug Landed				
0900pm						742	Washed Up Rigged Down				
						742					
						742					
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						742					
Left Yard	0200pm			Left Loc.							
Arrived Loc.	0400pm			Left Loc.							
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)	David Thorne				
Yes	540	Yes		25	Yes	1200	Service Supervisor				

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Customer: NORTHEAST NATURAL ENERGY LLC	Date: 1/7/2017	Serv. Supervisor: Aaron Shreve
Cust. Rep.: JIM QUESENBERY	Ticket #: JWV17-0007	Serv. Center: Jane Lew, WV
Lease: Fisher 13H	API Well #:	County: Monongalia State: WV
Well Type:	Rig: US Energy 9-1	Type of Job: Intermediate 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 (bbls)	Mix Water (bbls)
Spacer 1:	6% Gel		-	8.7			25	
Spacer 2:			-					
Scavenger								
Lead								
Tail:	CJ910 + 1% CJ110		871	15.6	1.19	5.22	184	108

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)
12 1/4		1198	Casing	9 5/8	40		2622		8.84		

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
13 3/8	54.5	12.61	1424					45			

WELL FLUID		DISPLACEMENT FLUID			DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)	WATER ON LOC (bbl)
TYPE	DENSITY	VOLUME	TYPE	DENSITY				
		195 bbl	water	8.3 ppg	973	1473	1550	1000

Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details
9:30AM						0	Location Time/Still Running Casing
9:35AM						0	Spot trucks/Rig In
10:20AM						0	Finished Casing
11:00AM						0	Safety Meeting
11:30AM	3	80			220	220	Load Casing
12:40PM						220	Stab Head
12:50 PM	2	2500			2	222	PSI Test
1:00PM	4.5	200			25	247	Pumped Gel
1:05pm	4.5	180			10	257	Pumped Water Pad/Circulation
1:10PM	6	350			184	441	Pumped Cement
1:40PM	6	220			195	636	Released Plug/Displace
12:00 AM	3	1550			1	637	Landed Plug/2BBL Cement Back
						637	
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Left Yard	1/7/2017@7:15AM		Left Loc.	1/7/2017@3:30PMC			
Arrived Loc.	1/7/2017@9:30AM		Left Loc.				
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)	Aaron Shreve Service Supervisor
yes	1050	yes	no	2	yes	1550	

Customer: NORTHEAST NATURAL ENERGY LLC	Date: 3/7/2017	Serv. Supervisor: Ronnie Helmick
Cust. Rep.: Jamie	Ticket #: JWV1703-0008	Serv. Center: Jane Lew, WV
Lease: Fisher 13H	API Well #: 47-061-01739	County: Monongalia State: WV
Well Type: Gas	Rig: Nabors Drilling X08	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 + 0.5 gpb CJ880	230	13.5			50	50
Spacer 2:							
Scavenger							
Lead							
Tail:	50:50 CJ010:CJ910 + 0.3% CJ210F + 0.2% CJ500U + 0.2% CJX157011	3450	14.5	1.18	5.19	724	427

Displacement Chemicals:

OPEN HOLE DATA			TUBULAR DATA								
SIZE (in)	EXCESS (%)	DEPTH (ft)	TYPE (CSG/TB3/DP)	OD (in)	WEIGHT (lbs/ft)	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)
8 3/4		6311	Casing	5 1/2	20	BTC	17252	C-75	4.79	8610	8830
8 1/2	10	10941									

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	2624					17252	17229		

WELL FLUID		DISPLACEMENT FLUID			DIFF PRESS (psi)	CSG LIFT (psi)	MAX PRESS (psi)	WATER ON LOC (bbl)
TYPE	DENSITY	VOLUME	TYPE	DENSITY				
mud	12.5 ppg	381 bbl	water	8.3 ppg	6040	6959	7000	1500

Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Ann. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details
9:30 PM						0	arrived on location
11:00 PM						0	customer requested time
11:15 PM						0	pre rig up meeting
11:30 PM						0	start spotting trucks
12:05 AM						0	Start rigging up to V door
2:30 AM						0	Safety meeting
2:53 AM		7044				0	Pressure test
3:07 AM	3	647			50	50	start Spacer @ 13.5 ppg
3:20 AM	6	987			685	735	Start cement @ 14.5 ppg
5:20 AM						735	shut down, wash lines drop the plug
						735	plug wouldn't fit head. Took head off and plug wouldn't fit in casing
						735	company man had a different plug we used it
5:40 AM	7	3700			382	1117	Start displacement
6:41 AM		4571				1117	plug landed
						1117	hold pressure for 5 min
6:46 AM						1117	bled off 6 bbls of water back
6:50 AM						1117	washup truck and rig down
						1117	
8:30 AM						1117	C&J released
						1117	
						1117	Thank you for calling C&J Energy
						1117	

Left Yard	3/7/17 @ 18:00	Left Loc.	3/8/17 @ 8:30				
Arrived Loc.	3/7/17 @ 21:30	Returned Yd	3/8/17 @ 10:00				
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)	Ronnie Helmick Service Supervisor
Yes	4571	Yes	0	0	Yes	4500	

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Perforation Record					
Stage No.	Report Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation
1	7/4/2017	16,980	16,858	40	Marceullus
2	7/4/2017	16,823	16,721	40	Marceullus
3	7/4/2017	16,683	16,566	40	Marceullus
4	7/5/2017	16,527	16,365	40	Marceullus
5	7/6/2017	16,327	16,166	40	Marceullus
6	7/6/2017	16,128	15,967	40	Marceullus
7	7/7/2017	15,929	15,768	40	Marceullus
8	7/7/2017	15,730	15,569	40	Marceullus
9	7/7/2017	15,531	15,369	40	Marceullus
10	7/7/2017	15,332	15,170	40	Marceullus
11	7/7/2017	15,132	14,971	40	Marceullus
12	7/8/2017	14,933	14,772	40	Marceullus
13	7/8/2017	14,734	14,573	40	Marceullus
14	7/8/2017	14,535	14,374	40	Marceullus
15	7/9/2017	14,336	14,174	40	Marceullus
16	7/9/2017	14,137	13,975	40	Marceullus
17	7/9/2017	13,937	13,776	40	Marceullus
18	7/9/2017	13,738	13,577	40	Marceullus
19	7/10/2017	13,539	13,378	40	Marceullus
20	7/10/2017	13,340	13,179	40	Marceullus
21	7/10/2017	12,141	12,979	40	Marceullus
22	7/11/2017	12,941	12,780	40	Marceullus
23	7/11/2017	12,742	12,581	40	Marceullus
24	7/11/2017	12,545	13,382	40	Marceullus
25	7/12/2017	12,344	12,183	40	Marceullus
26	7/12/2017	12,145	11,983	40	Marceullus
27	7/12/2017	11,946	11,784	40	Marceullus
28	7/12/2017	11,746	11,585	40	Marceullus
29	7/13/2017	11,547	11,386	40	Marceullus
30	7/13/2017	11,348	11,187	40	Marceullus
31	7/13/2017	11,149	10,988	40	Marceullus
32	7/14/2017	10,950	10,788	40	Marceullus
33	7/14/2017	10,751	10,589	40	Marceullus
34	7/14/2017	10,551	10,390	40	Marceullus
35	7/14/2017	10,352	10,191	40	Marceullus
36	7/15/2017	10,153	9,992	40	Marceullus
37	7/15/2017	9,954	9,793	40	Marceullus
38	7/16/2017	9,755	9,593	40	Marceullus
39	7/16/2017	9,556	9,394	40 RECEIVED	Marceullus
40	7/16/2017	9,356	9,195	40	Marceullus

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Stimulation Report

Stage No.	Report Date	Avg Treating Rate (BPM)	Avg Treating Pressure (psi)	Breakdown Pressure (psi)	ISIP (psi)	Total Amount of Proppant (lbs)	Total Clean Fluid (Bbls)
1	7/4/2017	79	8,386	6,593	4,799	299,704	7,825
2	7/4/2017	80	8,414	5,720	5,013	351,342	6,745
3	7/4/2017	80	8,494	6,766	5,279	350,300	7,030
4	7/5/2017	81	8,440	3,700	5,351	352,241	6,843
5	7/6/2017	80	8,359	6,407	5,139	352,715	6,327
6	7/6/2017	79	8,371	6,589	5,312	355,608	7,258
7	7/7/2017	80	8,260	6,638	5,273	351,929	6,981
8	7/7/2017	80	8,124	6,253	5,329	347,833	6,729
9	7/7/2017	80	8,310	6,432	5,078	350,096	6,606
10	7/7/2017	87	8,780	6,423	5,236	350,027	6,816
11	7/7/2017	88	8,657	6,696	5,512	352,311	6,605
12	7/8/2017	81	8,184	6,075	5,557	349,319	6,607
13	7/8/2017	80	8,111	6,632	5,388	350,976	6,697
14	7/8/2017	87	8,713	6,570	5,112	351,125	6,778
15	7/9/2017	79	8,351	6,839	5,109	349,696	6,929
16	7/9/2017	80	8,486	6,459	5,091	349,551	6,712
17	7/9/2017	80	8,354	6,518	4,530	349,073	6,562
18	7/9/2017	80	8,645	7,156	4,711	349,474	6,761
19	7/10/2017	82	8,429	7,143	5,212	350,532	7,741
20	7/10/2017	80	8,457	7,219	4,979	352,207	6,687
21	7/10/2017	78	8,419	7,051	5,676	350,969	8,644
22	7/11/2017	81	8,231	7,418	4,753	351,653	6,640
23	7/11/2017	80	8,181	7,182	4,575	353,537	6,618
24	7/11/2017	80	8,394	7,814	4,795	350,851	6,804
25	7/12/2017	81	8,311	7,861	5,528	351,562	6,738
26	7/12/2017	80	8,411	7,259	5,078	321,249	6,494
27	7/12/2017	82	8,347	8,077	5,856	350,999	6,690
28	7/12/2017	80	8,380	7,950	5,187	349,769	6,887
29	7/13/2017	81	8,340	8,436	5,473	351,775	6,777
30	7/13/2017	81	8,477	7,769	5,223	352,872	6,844
31	7/13/2017	80	8,568	7,694	5,256	350,476	6,443
32	7/14/2017	80	8,246	8,102	5,279	350,891	6,576
33	7/14/2017	83	8,302	8,081	5,355	353,340	6,664
34	7/14/2017	79	8,263	7,898	5,173	349,924	6,867
35	7/14/2017	79	8,398	9,035	5,088	346,879	6,645
36	7/15/2017	80	8,409	8,475	5,172	353,329	6,796
37	7/15/2017	80	8,290	8,856	5,297	350,192	6,721
38	7/16/2017	81	8,258	8,526	4,974	350,783	6,635
39	7/16/2017	82	8,182	8,259	5,165	352,131	6,586
40	7/16/2017	79	7,926	7,292	5,389	349,283	6,407

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Formations and Depths

<u>Lithology/Formation</u>	<u>Top Depth in FT Name TVD</u>	<u>Bottom Depth in FT TVD</u>	<u>Top Depth in FT MD</u>	<u>Bottom Depth in FT MD</u>	<u>Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)</u>
Gray Sand/Shale	0	245			sand/shale
Gray/Red Shale	245	335			shale
Gray Sand	335	350			sand
Coal	350	355			coal
Sand	355	375			sand
Coal	375	380			coal
Sand/Shale	380	1056			sand/shale
Coal	1056	1066			coal
Sand/Shale	1066	1135			sand/shale
Gray/Red Shale	1135	1670			shale
Sand	1670	1864			sand
Coal	1884	1890			coal
Sand/Shale	1890	1920			sand/shale
Coal	1920	1930			coal
Sand/shale	1930	2480			sand/shale
Sand	2480	2680			sand
Sand/shale	2680	3600			sand/shale
Sandstone/Shale/Siltstone	3600	6300			sandstone/shale/siltstone
Middlesex	7581	7795	7990	8308	shale
Burkett	7795	7991	8308	8559	shale
Geneseo	7991	8029	8559	8656	shale
Tully	8029	8075	8656	8727	limestone
Hamilton	8075	8185	8727	8934	shale
Marcellus	8185	8236	8934	9080	shale
Cherry Valley	8236	8239	9080	9090	limestone
Lower Marcellus	8239		9090		shale

Hydraulic Fracturing Fluid Product Component Information Disclosure

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WV Department of
Environmental Protection

Job Start Date:	7/4/2017
Job End Date:	7/16/2017
State:	West Virginia
County:	Monongalia
API Number:	47-061-01739-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Fisher 13H
Latitude:	39.69648700
Longitude:	-80.21354900
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8,269
Total Base Water Volume (gal):	11,841,984
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	Operator	Carrier					
			Water	7732-18-5	100.00000	87.45689	
Sand, White	BJ Services	Proppant					
				Listed Below			

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Other Chemical (s)	BJ Services	See Trade Name (s) List					
			Water	7732-18-5	92.50000	0.11509	
HCl, 5.1 - 7.5%	BJ Services	Acidizing					
				Listed Below			
MaxPerm 30	BJ Services	Friction Reducer					
				Listed Below			
Ferrotrol 300L	BJ Services	Iron Control					
				Listed Below			
CI-14	BJ Services	Corrosion Inhibitor					
				Listed Below			
K-139	Nalco-Champion	Microbial Control					
				Listed Below			
EC6486A	Nalco-Champion	Scale Inhibitor					
				Listed Below			
Items above are Trade Names with the exception of Base Water . Items below are the individual ingredients.							
			Crystalline Silica (Quartz)	14808-60-7	100.00000	12.36378	
			Acrylamide Modified Acrylic Polymer	38193-60-1	60.00000	0.02960	
			Petroleum distillates	64742-47-8	30.00000	0.01480	
			Hydrochloric Acid	7647-01-0	7.50000	0.00680	

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			Quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides	68424-85-1	30.00000	0.00486	
			Sodium Chloride	7647-14-5	5.00000	0.00247	
			Sorbitan monooleate ethoxylate	9005-65-6	5.00000	0.00247	
			Sorbic acid, mono-(9Z)-octadecenoate	1338-43-8	5.00000	0.00247	
			Oxyalkylated Alcohol	78330-21-9	5.00000	0.00247	
			Glutaraldehyde	111-30-8	10.00000	0.00191	
			Citric Acid	77-92-9	60.00000	0.00159	
			Ethylene Glycol	107-21-1	30.00000	0.00141	
			Amine Triphosphate	Proprietary	30.00000	0.00127	
			Ethanol	64-17-5	5.00000	0.00066	
			Methanol	67-56-1	100.00000	0.00061	
			Acetic acid	127-08-2	1.00000	0.00049	
			Polyoxyalkylenes	68951-67-7	30.00000	0.00018	
			Fatty Acids	61790-12-3	10.00000	0.00006	
			Tetrasodium EDTA	64-02-8	0.10000	0.00005	
			Acetic acid, Potassium Salt	64-19-7	0.10000	0.00005	
			Modified Thiourea Polymer	68527-49-1	7.00000	0.00004	
			Olefin	64743-02-8	5.00000	0.00003	
			Propargyl Alcohol	107-19-7	5.00000	0.00003	
			Formaldehyde	50-00-0	1.00000	0.00001	
			Ammonium Persulfate	7727-54-0	100.00000		

* Total Water Volume sources may include various types of water including fresh water, produced water, and recycled water

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

*** If you are calculating a percentage of total ingredients do not add the water volume below the green line to the water volume above the green line

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

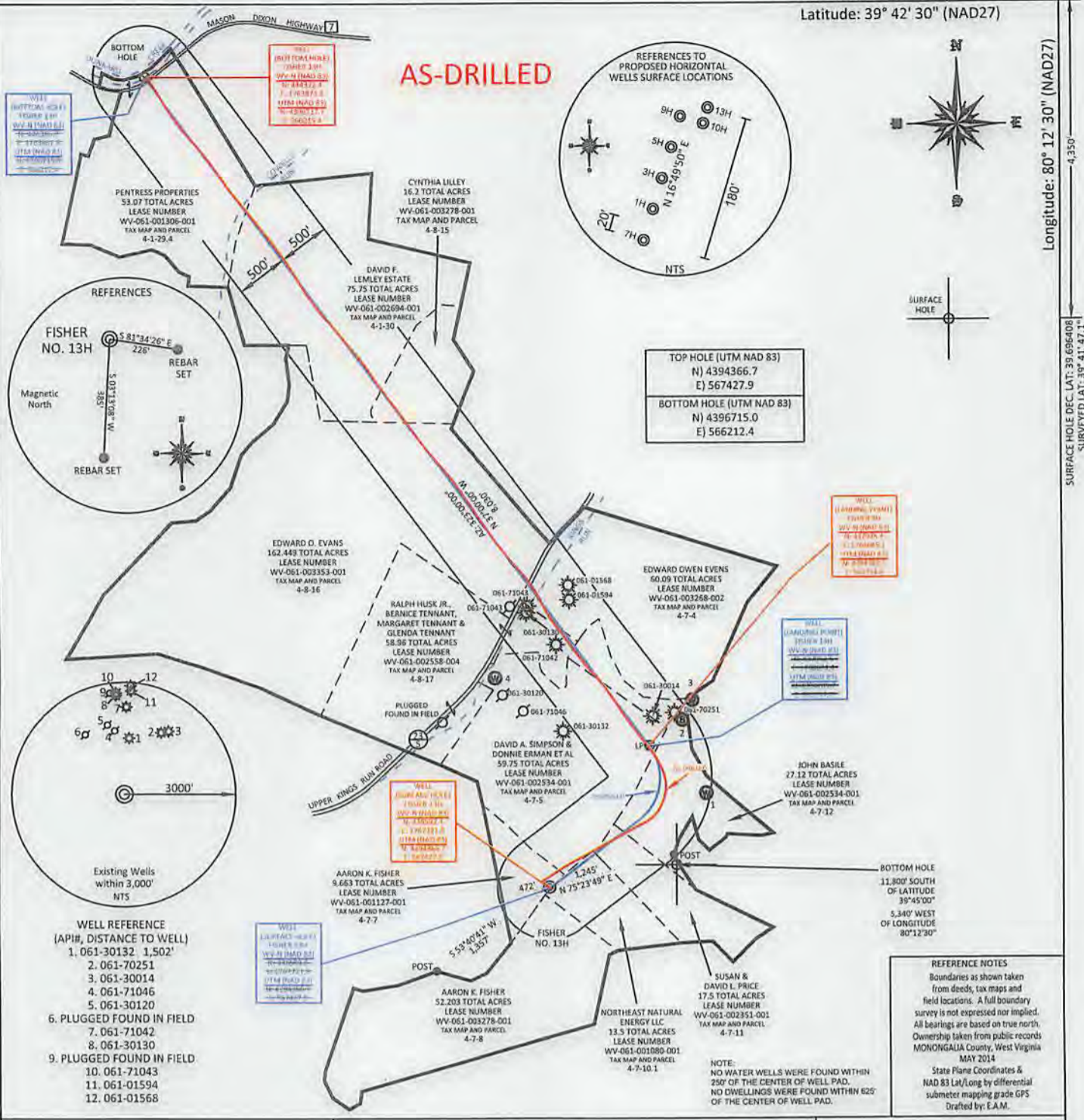
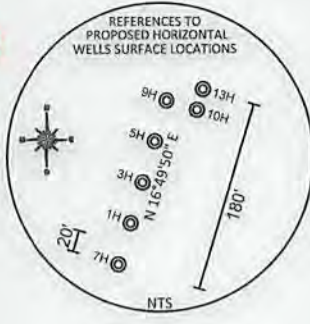
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

SURFACE HOLE DEC. LONG: 80.213755
SURVEYED LONG: 80° 12' 49.5"

Latitude: 39° 42' 30" (NAD27)


Longitude: 80° 12' 30" (NAD27)

AS-DRILLED



FILE #: NNE14
DRAWING #: 2478
SCALE: PLAT: 1" = 1400'
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: 
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 AS-BUILT ELEVATION: 1,453'

COUNTY/DISTRICT: MONONGALIA / CLAY QUADRANGLE: BLACKSVILLE

SURFACE OWNER: AARON K. FISHER ACREAGE: 9.663 +/-

OIL & GAS ROYALTY OWNER: HENRY P. AMES, III, ET AL ACREAGE: 606.255

LEASE NUMBERS: _____

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: 8,267.11' TMD: 17,252'

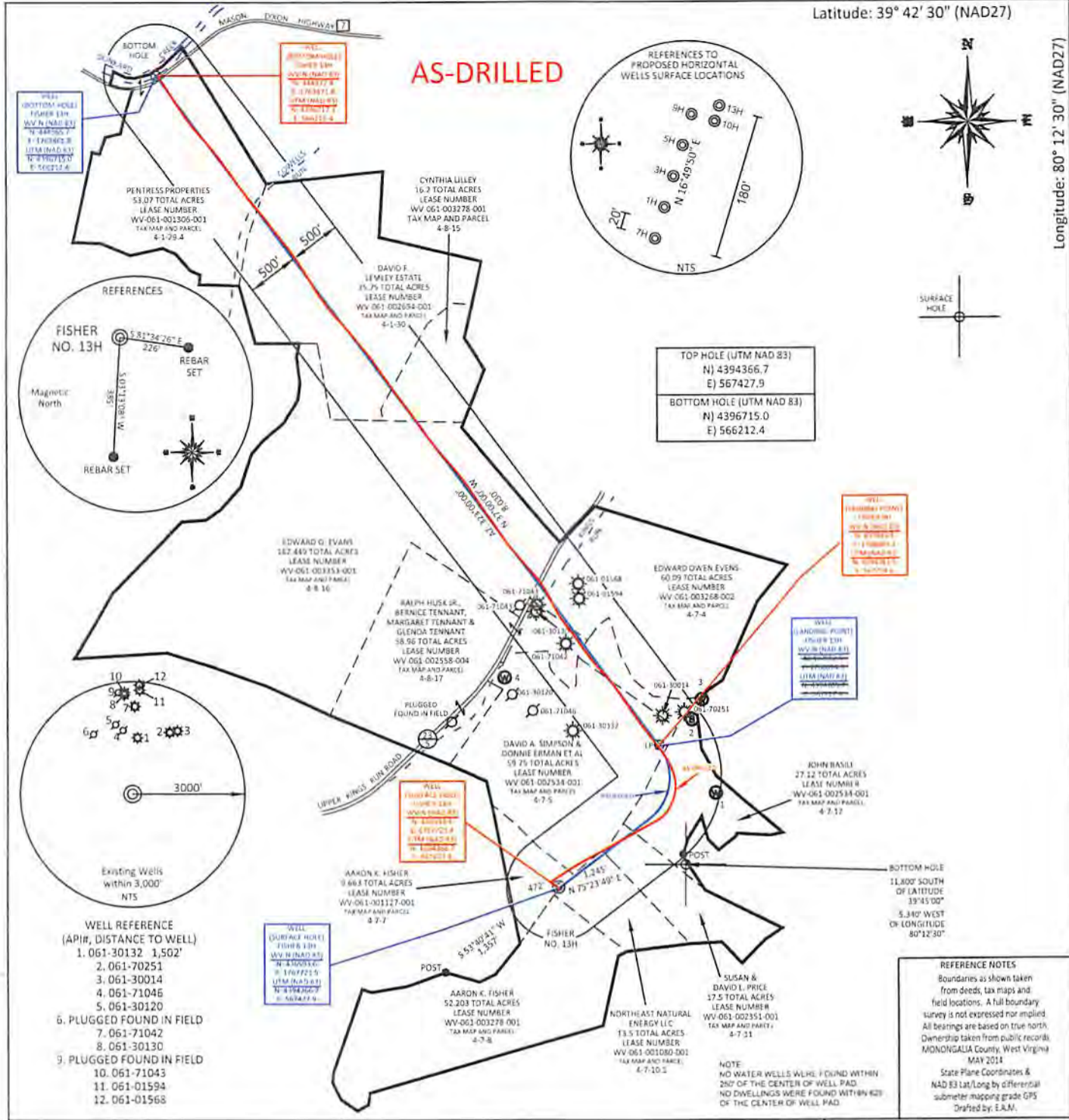
WELL OPERATOR: NORTHEAST NATURAL ENERGY LLC DESIGNATED AGENT: JOHN ADAMS
ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200 ADDRESS: 707 VIRGINIA STREET EAST, SUITE 1200
CITY: CHARLESTON STATE: WV ZIP CODE: 25301 CITY: CHARLESTON STATE: WV ZIP CODE: 25301

07/20/2018

SURFACE HOLE DEC. LONG: 80.213755
 SURVEYED LONG: 80° 12' 49.5"
 Latitude: 39° 42' 30" (NAD27)

Longitude: 80° 12' 30" (NAD27)

AS-DRILLED



- WELL REFERENCE (API#, DISTANCE TO WELL)**
- 061-30132 1,502'
 - 061-70251
 - 061-30014
 - 061-71046
 - 061-30120
 - PLUGGED FOUND IN FIELD
 - 061-71042
 - 061-30130
 - PLUGGED FOUND IN FIELD
 - 061-71043
 - 061-01594
 - 061-01568

REFERENCE NOTES
 Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records, MONONGALIA County, West Virginia MAY 2014
 State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS
 Drafted by: E.J.A.M.

FILE #: NNE14
 DRAWING #: 2478
 SCALE: PLAT: 1" = 1400'
TICK: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/200
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 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