

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

API 47 - 061 - 01801 County Monongalia District Clay
Quad Blacksville Pad Name Yost Field/Pool Name _____
Farm name Yost Heritage Inc. Well Number 11H
Operator (as registered with the OOG) Northeast Natural Energy LLC
Address 707 Virginia St. 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 4388282.0 Easting 567084.2
Landing Point of Curve Northing 4387964.7 Easting 566362.3
Bottom Hole Northing 4390676.0 Easting 564385.8

Elevation (ft) 1,492' 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 7/6/2018 Date drilling commenced 9/10/2018 Date drilling ceased 3/30/2019
Date completion activities began 5/11/2019 Date completion activities ceased 6/2/2019
Verbal plugging (Y/N) NA Date permission granted NA Granted by NA

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

Freshwater depth(s) ft 180', 480', 1,378' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 2,410' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 775', 930', 1,115' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by: _____

API 47-061 - 01801 Farm name Yost Heritage Inc. Well number 11H

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	NA	Y, CTS
Surface	17.5	13-3/8	1,455	N	54.5	NA	Y, CTS
Coal							
Intermediate 1	12.25	9-5/8	2,585	N	40	NA	Y, 10 bbl
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	20,905'	N	20	NA	N
Tubing							
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	Class A psi grout					CTS	48
Surface	Class A	1,166	15.6	1.1979	1,396	CTS	8
Coal							
Intermediate 1	Class A	839	15.2	1.2618	1,059	CTS	8
Intermediate 2							
Intermediate 3							
Production	Class A	4160	14.5	1.15	4,280	7,450' via bond log	48
Tubing							

Drillers TD (ft) 20,931' Loggers TD (ft) 20,901'
 Deepest formation penetrated Marcellus Plug back to (ft) NA
 Plug back procedure NA

Kick off depth (ft) 6,368'

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 - 01801 Farm name Yost Heritage Inc. Well number 11H

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	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)
	See	Attached						

Please insert additional pages as applicable.

API 47- 061 - 01801 Farm name Yost Heritage Inc. Well number 11H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
<u>Marcellus</u>	<u>8,176'</u>	<u>TVD</u>	<u>20,931'</u> <u>MD</u>
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 3057 psi Bottom Hole 4460 psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 1953 mcfpd Oil _____ bpd NGL _____ bpd Water _____ bpd GAS MEASURED BY Estimated Orifice Pilot

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

Please insert additional pages as applicable.

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

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

Cementing Company BJ Services
Address 3415 Millennium Blvd SE City Massillon State OH Zip 44646

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

Please insert additional pages as applicable.

Completed by Hollie Medley Telephone 304-212-0422
Signature Hollie Medley Title Regulatory Manager Date 10/24/19

Describe rock type and record quantity and type of fluid (freshwater, brine, oil, gas, H2S, etc)

Bottom Depth in FT TVD

Top Depth in FT TVD

Lithology/Formation

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	120	Shale/Sand
Shale/sand/silt	120	390	Shale/sand/silt with water @ 180'
sand/shale	390	510	sand/shale with water @ 480'
sandstone/siltstone	510	775	sandstone/siltstone
coal	775	780	coal
sandstone/limestone	780	930	sandstone/limestone
coal	930	940	coal
sandstone/limestone	940	1020	sandstone/limestone
Limestone	1020	1050	Limestone
Limestone/siltstone	1050	1110	Limestone/siltstone
coal	1110	1115	coal
Limestone	1115	1140	Limestone
Limestone/sandstone/shale	1114	1260	Limestone/sandstone/shale
red shale/siltstone	1260	1440	red shale/siltstone with water @ 1378'
sandstone/siltstone	1440	1680	sandstone/siltstone
sandstone/siltstone/lime	1680	2310	sandstone/siltstone/lime
Big Lime	2310	2400	Big Lime
Big Injun	2400	2580	Big Injun
siltstone	2580	2620	siltstone
Gantz	2620	2680	Gantz
siltstone	2680	3050	siltstone
Sandstone	3050	3180	Sandstone
Upper Devonian undifferentiated	3180	6000	Upper Devonian undifferentiated
siltstone/shale/gray shale	6000	6450	siltstone/shale/gray shale
Devonian silt/sand/shale	6450	7550	Devonian silt/sand/shale
Middlesex	7550	7770	Middlesex
Burkett	7770	7960	Burkett
Geneseo	7960	8011	Geneseo
Tully	8011	8062	Tully
Hamilton	8062	8176	Hamilton
Marcellus	8176	TD	Marcellus

Yost 11H Perforation Record

Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	5/1/19	0	20,856	0
2	5/2/19	20,566	20,724	40
3	5/2/19	20,367	20,524	40
4	5/2/19	20,167	20,325	40
5	5/3/19	19,968	20,125	40
6	5/3/19	19,768	19,926	40
7	5/4/19	19,569	19,726	40
8	5/4/19	19,369	19,527	40
9	5/5/19	19,170	19,327	40
10	5/5/19	18,970	19,128	40
11	5/6/19	18,771	18,928	40
12	5/7/19	18,571	18,729	40
13	5/7/19	18,372	18,529	40
14	5/7/19	18,172	18,330	40
15	5/8/19	17,973	18,130	40
16	5/8/19	17,773	17,931	40
17	5/9/19	17,574	17,731	40
18	5/9/19	17,374	17,532	40
19	5/9/19	17,175	17,332	40
20	5/10/19	16,975	17,133	40
21	5/11/19	16,776	16,933	40
22	5/11/19	16,576	16,734	40
23	5/12/19	16,377	16,535	40
24	5/12/19	16,177	16,335	40
25	5/13/19	15,978	16,136	40
26	5/13/19	15,778	15,936	40
27	5/14/19	15,579	15,737	40
28	5/14/19	15,380	15,537	40
29	5/15/19	15,180	15,338	40
30	5/15/19	14,981	15,138	40
31	5/16/19	14,781	14,939	40
32	5/16/19	14,582	14,739	40
33	5/17/19	14,382	14,540	40
34	5/17/19	14,183	14,340	40
35	5/18/19	13,983	14,141	40
36	5/18/19	13,784	13,941	40
37	5/19/19	13,584	13,742	40
38	5/19/19	13,385	13,542	40
39	5/20/19	13,185	13,343	40
40	5/20/19	12,986	13,143	40
41	5/24/19	12,786	12,944	40
42	5/24/19	12,587	12,744	40
43	5/25/19	12,387	12,545	40
44	5/25/19	12,188	12,345	40
45	5/26/19	11,988	12,146	40
46	5/26/19	11,789	11,946	40
47	5/27/19	11,589	11,747	40
48	5/28/19	11,390	11,548	40
49	5/28/19	11,190	11,348	40
50	5/29/19	10,991	11,149	40
51	5/29/19	10,791	10,949	40
52	5/30/19	10,592	10,750	40
53	5/30/19	10,393	10,550	40
54	5/30/19	10,193	10,351	40
55	5/31/19	9,994	10,151	40
56	5/31/19	9,794	9,952	40
57	6/1/19	9,595	9,752	40

Yost 11H Stimulation Information

Stage Number	Report Date	ISIP (psi)	Breakdown Pressure (psi)	Avg Treating Pressure (psi)	Avg Treating Rate (BPM)	Pad Volume (bbls)	Total Clean Fluid (Bbls)	Total Proppant Amount (lbs)	Flush Volume (bbls)
1	43,586	4,795	6,897	8,751	85	1,037	7,177	301,980	461
2	43,587	5,501	7,566	8,800	83	732	8,688	287,920	1,277
3	43,587	5,207	6,977	9,402	90	649	10,721	452,300	456
4	43,587	4,001	6,803	9,097	86	644	9,861	452,000	450
5	43,588	4,520	7,316	9,153	89	653	10,369	447,100	446
6	43,588	5,623	7,606	9,401	90	521	10,369	450,000	444
7	43,589	5,391	7,112	9,400	85	600	11,116	449,800	434
8	43,589	4,492	7,030	9,581	90	437	10,248	453,970	433
9	43,590	4,705	5,950	9,286	86	207	9,107	452,240	427
10	43,590	5,056	6,814	9,376	90	614	8,760	454,660	435
11	43,591	4,824	7,040	8,735	81	573	9,434	451,360	417
12	43,592	5,724	6,356	9,252	85	548	11,239	453,790	414
13	43,592	4,712	7,124	8,476	80	366	8,654	451,560	411
14	43,592	4,838	7,868	8,749	80	373	8,694	450,980	407
15	43,593	4,854	6,446	8,567	80	362	9,754	450,280	402
16	43,593	5,158	6,596	8,633	81	373	8,880	447,900	396
17	43,594	5,212	7,678	8,660	80	100	9,228	457,300	395
18	43,594	5,543	6,821	8,636	81	200	9,401	450,260	389
19	43,594	5,326	7,505	8,639	82	382	8,663	452,320	383
20	43,595	4,868	7,297	8,858	82	180	9,822	449,870	424
21	43,596	4,992	7,675	8,861	81	125	9,537	459,340	375
22	43,596	5,075	7,150	8,553	80	350	8,540	450,460	384
23	43,597	4,448	8,095	8,619	80	195	9,689	459,460	365
24	43,597	4,995	7,776	8,848	83	373	8,790	451,320	365
25	43,598	5,325	7,591	8,627	80	142	8,866	450,080	361
26	43,598	6,260	7,211	8,465	81	436	9,581	455,560	355
27	43,599	5,382	7,411	8,530	81	113	9,500	451,150	350
28	43,599	5,154	6,188	8,484	80	395	9,022	452,720	345
29	43,600	4,834	7,542	8,135	80	170	9,131	450,900	347
30	43,600	5,348	7,176	8,423	82	200	9,034	452,520	338
31	43,601	5,015	7,533	8,305	82	255	9,027	451,240	334
32	43,601	4,874	7,749	8,271	81	179	9,076	455,240	330
33	43,602	5,253	7,456	8,331	81	239	8,956	450,980	322
34	43,602	5,008	7,760	8,449	81	125	8,997	450,220	318
35	43,603	4,943	8,064	8,442	80	184	9,579	450,880	312
36	43,603	5,403	7,588	8,291	82	201	8,936	456,090	310
37	43,604	5,587	8,649	8,310	80	195	9,342	457,120	306
38	43,604	5,719	7,795	8,223	80	150	8,446	450,820	300
39	43,605	5,376	7,778	8,480	80	130	8,905	452,580	295
40	43,605	5,873	7,313	8,301	80	195	9,319	451,620	291
41	43,609	5,588	7,674	8,363	81	275	9,590	451,800	286
42	43,609	5,138	7,127	8,067	81	394	9,238	450,300	281
43	43,610	5,664	7,210	7,883	80	198	9,377	452,200	277
44	43,610	5,478	7,588	8,026	80	335	9,522	447,420	269
45	43,611	5,892	7,155	7,826	79	152	9,944	448,080	268
46	43,611	6,110	7,605	7,892	80	470	9,866	452,500	377
47	43,612	6,044	7,729	7,829	80	201	8,669	450,920	258
48	43,613	5,541	7,269	7,840	80	225	9,227	450,120	255
49	43,613	5,988	7,107	7,497	79	100	9,195	455,000	252
50	43,614	5,821	6,936	7,652	80	197	9,152	454,900	248
51	43,614	4,758	5,859	7,569	80	174	9,643	453,640	245
52	43,615	4,649	6,661	7,413	80	225	8,964	450,800	236
53	43,615	4,954	6,822	7,590	79	115	8,816	449,540	230
54	43,615	4,484	7,341	7,604	81	150	8,508	448,180	231
55	43,616	5,125	8,901	7,807	81	163	9,084	451,400	228
56	43,616	5,502	8,947	7,890	80	150	8,883	450,160	221
57	43,617	5,171	7,619	7,305	82	80	8,933	461,260	223

NORTHEAST NATURAL ENERGY, LLC

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

Slot: Slot 11
 Well: Yost 11H
 Wellbore: Yost 11H PWB

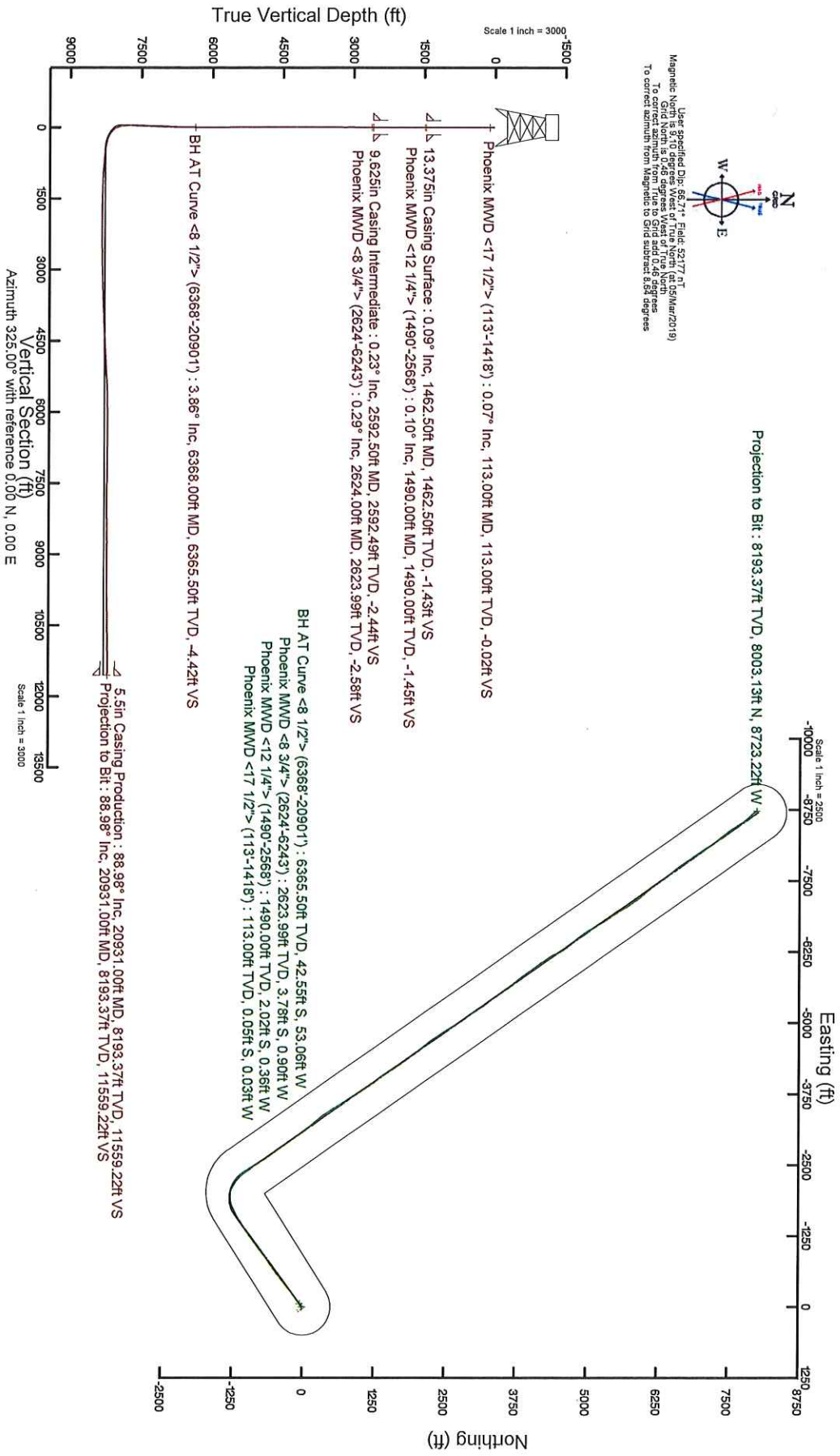
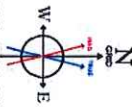
Pit reference wellbore is Yost 11H PWB Rev-A-0	Grid System: NAD83 / Lambert West Virginia SP, Northern Zone (7701), US feet
True vertical depths are referenced to Precision 228 (RKB)	North Reference: Grid north
Precision 228 (RKB) to Mean Sea Level: 1514.5 feet	Scale: True distance
Mean Sea Level to Ground level (At Slot: Slot 11): -1492 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: aaljan on 2019-04-04
	Database: WVA_MPL_EASTERNUS_Dein

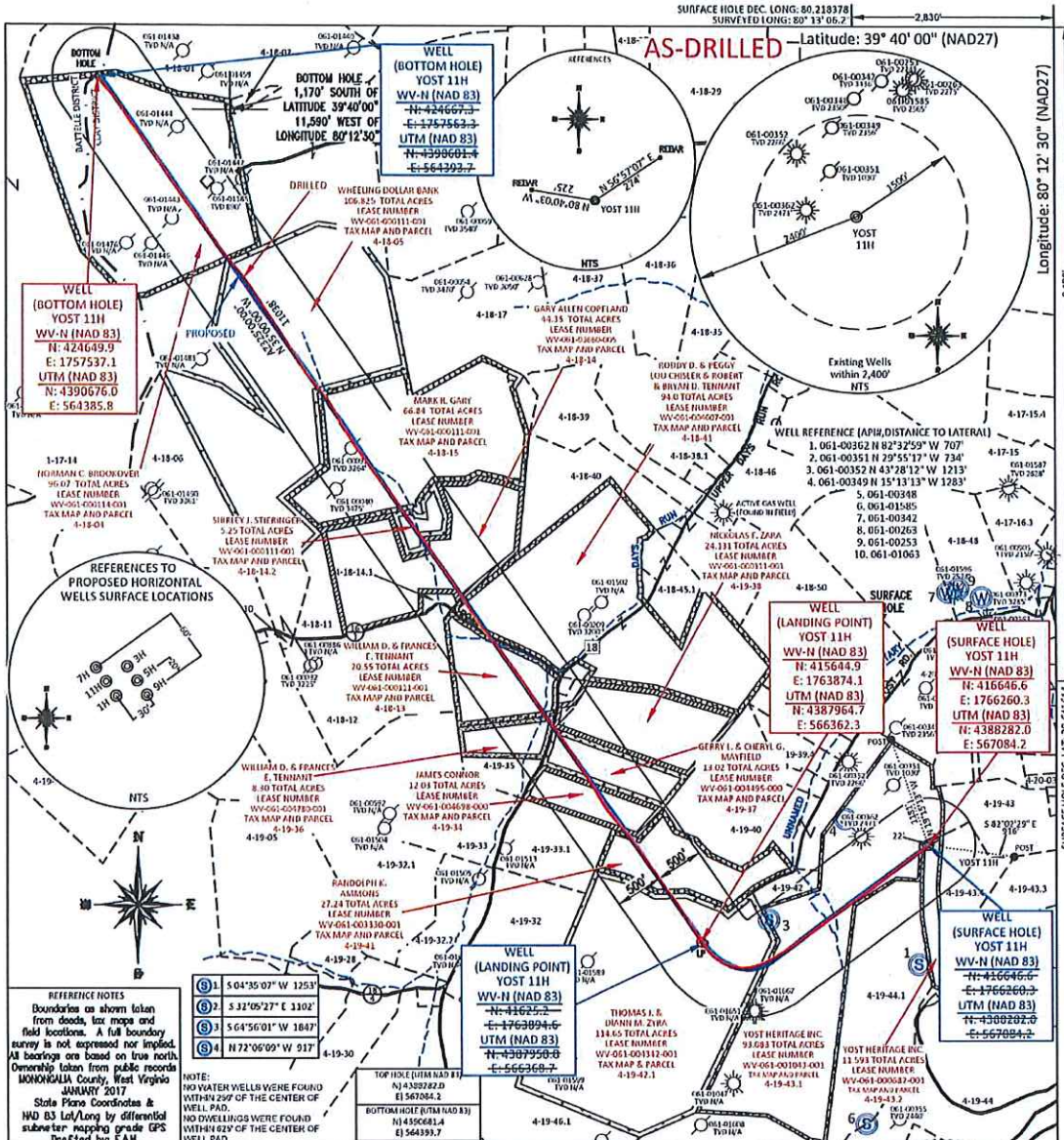


Location Information		Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Facility Name	Yost Pad	1766284.700	416664.100	39°38'30.274"N	80°13'05.121"W
Slot	Local N (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot 11	-17.50	-24.40	1766250.300	39°38'30.099"N	80°13'05.431"W
Precision 228 (RKB) to Ground level (At Slot: Slot 11)				22.5ft	
Mean Sea Level to Ground level (At Slot: Slot 11)				-1492ft	
Precision 228 (RKB) to Mean Sea Level				1514.5ft	

Comments	
API: 47-061-01801-0000	
BH Job #: 109650642	
Rig: Precision 228	
Duration: 03/11/2019 - 03/26/2019	

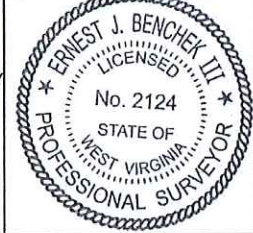
User specified Dip: 85.271° E (52177 at 156Mm/2019)
 Magnetic North is 0.48 degrees West of True North
 To correct azimuth from True to Grid add 0.48 degrees
 To correct azimuth from Magnetic to Grid subtract 85.24 degrees





FILE #: NNE16
 DRAWING #: 2757
 SCALE: PLAT: 1" = 1500'
 TICK: 1" = 2000'
 MINIMUM DEGREE OF ACCURACY: 1/200
 PROVEN SOURCE OF ELEVATION: SUBMITTER 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

DATE: OCTOBER 22, 2019
 OPERATOR'S WELL #: YOST 11H
 API WELL #: 47 61
 STATE COUNTY PERMIT

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

WATERSHED: DUNKARD CREEK AS-BUILT ELEVATION: 1,492'
 COUNTY/DISTRICT: MONONGALIA / CLAY QUADRANGLE: BLACKSVILLE
 SURFACE OWNER: YOST HERITAGE INC. ACREAGE: 11.593 +/-
 OIL & GAS ROYALTY OWNER: Joe Pogue, et al ACREAGE: 737.932 +/-
 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 AS-DRILLED DEPTH: TVD: 8,193' TMD: 20,931'
 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

Cementing Treatment



Start Date	9/11/2018	Field Ticket#	
End Date	9/12/2018	Well	YOST 11H
Client	NORTHEAST NATURAL ENERGY LLC	API#	47-061-01801
Client Field Rep.	Jamie Czerneski	Well Classification	
Service Sup.	Michael Romans	County	MONONGALIA
District	Bridgeport, WV	State/Province	WV
Type of Job	Surface	Formation	
Execution ID	EXC-10970-P0D5Q502	Rig	Highlands 8
Project ID	PRJ1010673		

WELL GEOMETRY

Type	ID (in)	OD (in)	Wt. (lb/ft)	MD (ft)	TVD (ft)	Excess(%)	Grade	Thread
Previous Casing	23.25	24.00	94.58	40.00	40.00			
Open Hole	17.50			1,489.00	1,489.00	30.00		
Casing	12.62	13.38	54.50	1,455.00	1,455.00			

Shoe Length (ft): 43

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Bottom Plug Provided By		Tool Depth (ft)	1,412.00
Bottom Plug Size		Max Tubing Pressure - Rated (psi)	
Top Plug Used?	Yes	Max Tubing Pressure - Operated (psi)	
Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	
Top Plug Size	13.375	Max Casing Pressure - Operated (psi)	
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity		Job Pumped Through	Manifold
Centralizers Type	Bow	Top Connection Thread	BTC
Landing Collar Depth (ft)	1,412	Top Connection Size	13.375

CIRCULATION PRIOR TO JOB

Well Circulated By		Solids Present at End of Circulation	No
Circulation Prior to Job	No	10 sec SGS	
Circulation Time (min)		10 min SGS	
Circulation Rate (bpm)		30 min SGS	
Circulation Volume (bbls)		Flare Prior to/during the Cement Job	No

Cementing Treatment



Lost Circulation Prior to Cement Job No Gas Present No
 Mud Density In (ppg) Gas Units
 Mud Density Out (ppg)
 PV Mud In
 PV Mud Out
 YP Mud In
 YP Mud Out

TEMPERATURE

Ambient Temperature (°F) 66.00 Slurry Cement Temperature (°F) 75.00
 Mix Water Temperature (°F) 67.00 Flow Line Temperature (°F)

BJ FLUID DETAILS

Fluid Type	Fluid Name	Density (ppg)	Yield (Cu Ft/sk)	H2O Req. (gals/sk)	Planned Top of Fluid (Ft)	Length (Ft)	Vol (sk)	Vol (Cu Ft)	Vol (bbls)
Spacer / Pre Flush / Flush	Fresh Water	8.3400			0.00				10.0000
Spacer / Pre Flush / Flush	Gel Spacer	8.6100			0.00				25.0000
Spacer / Pre Flush / Flush	Fresh Water	8.3400			0.00				10.0000
Tail Slurry	Cement Slurry	15.6000	1.1979	5.23	0.00	1,460.00	1,166	1,396.0000	248.6000
Displacement Final	Fresh Water	8.3400			0.00			0.0000	219.5000

Fluid Type	Fluid Name	Component	Concentration	UOM
Spacer / Pre Flush / Flush	Gel Spacer	IntegraSeal POLI	1.0000	PPB
Spacer / Pre Flush / Flush	Gel Spacer	Fresh Water	100.0000	PCT
Spacer / Pre Flush / Flush	Gel Spacer	EXTENDER, BENTONITE	20.0000	PPB
Tail Slurry	Cement Slurry	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	BWOB
Tail Slurry	Cement Slurry	CEMENT, CLASS A	100.0000	PCT
Tail Slurry	Cement Slurry	IntegraSeal POLI	0.2500	LBS/SK

TREATMENT SUMMARY

Time	Fluid	Rate (bpm)	Fluid Vol. (bbls)	Pipe Pressure (psi)	Annulus Pressure (psi)	Comments
9/12/2018 2:13 AM	Fresh Water	5.50	230.00	60.00		
9/12/2018 2:57 AM	Gel Spacer	4.00	25.00	40.00		

Cementing Treatment



9/12/2018 3:05 AM	Fresh Water	3.50	5.00	35.00		
9/12/2018 3:07 AM	Cement Slurry	5.50	248.60	170.00		
9/12/2018 3:54 AM	Fresh Water	6.50	218.00	400.00		
9/12/2018 3:50 PM	Cement Slurry	2.00	168.00	40.00		TOP OUT
9/13/2018 3:30 AM	Cement Slurry	2.00	18.00	0.00		TOP OUT

	Min	Max	Avg
Pressure (psi)	35.00	400.00	124.17
Rate (bpm)	2.00	6.50	4.14

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amount of Cement Returned/Reversed	0.00
Calculated Displacement Volume (bbls)	218.00	Method Used to Verify Returns	Visual
Actual Displacement Volume (bbls)	218.00	Amount of Spacer to Surface	0.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	
Bump Plug	Yes	Amount Bled Back After Job	1.50
Bump Plug Pressure (psi)	870.00	Total Volume Pumped (bbls)	726.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement returns During Job	None	Lost Circulation During Cement Job	No

CEMENT PLUG

Bottom of Cement Plug?	No	Wiper Balls Used?	No
Wiper Ball Quantity		Plug Catcher	No
Number of Plugs			

SQUEEZE

Injection Rate (bpm)	Fluid Density (ppg)
Injection Pressure (psi)	ISIP (psi)
Type of Squeeze	FSIP (psi)
Operators Max SQ Pressure (psi)	

COMMENTS

Treatment Report

Job Summary

Cementing Treatment



Start Date 9/15/2018 **Field Ticket#**
End Date 9/15/2018 **Well** YOST 11H
Client NORTHEAST NATURAL ENERGY LLC **API#** 47-061-01801
Client Field Rep. Jamie Czerneski **Well Classification**
Service Sup. Matthew Deel **County** MONONGALIA
District Bridgeport, WV **State/Province** WV
Type of Job Intermediate **Formation** Marcellus Shale
Execution ID EXC-11108-K3P0K002 **Rig** Highlands 8
Project ID PRJ1010811

WELL GEOMETRY

Type	ID (in)	OD (in)	Wt. (lb/ft)	MD (ft)	TVD (ft)	Excess(%)	Grade	Thread
Previous Casing	12.62	13.38	54.50	1,455.00	1,480.00			
Open Hole	12.25			2,630.00	2,630.00	40.00		
Casing	8.84	9.63	40.00	2,585.00	2,630.00			

Shoe Length (ft): 40.00

HARDWARE

Bottom Plug Used? No **Tool Type** Float Collar
Bottom Plug Provided By **Tool Depth (ft)** 2,540.00
Bottom Plug Size **Max Tubing Pressure - Rated (psi)**
Top Plug Used? Yes **Max Tubing Pressure - Operated (psi)**

Cementing Treatment



Top Plug Provided By	Non BJ	Max Casing Pressure - Rated (psi)	
Top Plug Size	9.625	Max Casing Pressure - Operated (psi)	
Centralizers Used	No	Pipe Movement	None
Centralizers Quantity		Job Pumped Through	Manifold
Centralizers Type		Top Connection Thread	BTC
Landing Collar Depth (ft)	2,590	Top Connection Size	9.625

CIRCULATION PRIOR TO JOB

Well Circulated By	BJ	Solids Present at End of Circulation	No
Circulation Prior to Job	Yes	10 sec SGS	
Circulation Time (min)	45.00	10 min SGS	
Circulation Rate (bpm)	5.00	30 min SGS	
Circulation Volume (bbbls)		Flare Prior to/during the Cement Job	No
Lost Circulation Prior to Cement Job	No	Gas Present	No
Mud Density In (ppg)		Gas Units	
Mud Density Out (ppg)			
PV Mud In			
PV Mud Out			
YP Mud In			
YP Mud Out			

TEMPERATURE

Cementing Treatment



Ambient Temperature (°F) 78.00 Slurry Cement Temperature (°F) 83.00
 Mix Water Temperature (°F) 74.00 Flow Line Temperature (°F)

BJ FLUID DETAILS

Fluid Type	Fluid Name	Density (ppg)	Yield (Cu Ft/sk)	H2O Req. (gals/sk)	Planned Top of Fluid (Ft)	Length (Ft)	Vol (sk)	Vol (Cu Ft)	Vol (bbls)
Spacer / Pre Flush / Flush	Gel Spacer	8.6100			0.00				25.0000
Spacer / Pre Flush / Flush	Fresh Water	8.3400			0.00				10.0000
Tail Slurry	Cement Slurry	15.2000	1.2618	5.75	0.00	2630	839	1,059.0000	188.4000
Displacement Final	Fresh Water	8.3400			0.00			0.0000	196.4000

Fluid Type	Fluid Name	Component	Concentration	UOM
Spacer / Pre Flush / Flush	Gel Spacer	Fresh Water	100.0000	PCT
Spacer / Pre Flush / Flush	Gel Spacer	EXTENDER, BENTONITE	20.0000	PPB
Tail Slurry	Cement Slurry	CEMENT, CLASS A	100.0000	PCT
Tail Slurry	Cement Slurry	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	1.5000	BWOB
Tail Slurry	Cement Slurry	FOAM PREVENTER, FP-13L	0.7000	GALS/100SK

TREATMENT SUMMARY

Time	Fluid	Rate (bpm)	Fluid Vol. (bbls)	Pipe Pressure (psi)	Annulus Pressure (psi)	Comments
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Cementing Treatment



9/15/2018 9:15:00 PM	Gel Spacer	5.00	25.00		
9/15/2018 9:22:00 PM	Fresh Water	5.00	10.00		
9/15/2018 9:25:00 PM	Cement Slurry	5.40	188.40		
9/15/2018 10:02:00 PM	Fresh Water	8.00	196.40		
		Min	Max	Avg	
Pressure (psi)		50.00	850.00	400.00	
Rate (bpm)		5.00	8.00	5.85	

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amount of Cement Returned/Reversed	10.00
Calculated Displacement Volume (bbls)	193.00	Method Used to Verify Returns	Visual
Actual Displacement Volume (bbls)	191.00	Amount of Spacer to Surface	25.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amount Bled Back After Job	1.50
Bump Plug Pressure (psi)	850.00	Total Volume Pumped (bbls)	606.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement returns During Job		Lost Circulation During Cement Job	No

CEMENT PLUG

Bottom of Cement Plug?	No	Wiper Balls Used?	No
Wiper Ball Quantity		Plug Catcher	No
Number of Plugs			

Cementing Treatment



SQUEEZE

Injection Rate (bpm)	Fluid Density (ppg)
Injection Pressure (psi)	ISIP (psi)
Type of Squeeze	FSIP (psi)
Operators Max SQ Pressure (psi)	

COMMENTS

Treatment Report

Job Summary

Cement Job Log



Customer: NORTHEAST NATURAL ENERGY LLC	Date: 3/28/2019	Serv. Supervisor: Donald Brown
Cust. Rep.: Troy Hambl	Ticket #: JWV1903-0029	Serv. Center: Jane Lew - 3044
Lease: Yost 11 H	API Well #: 47-061-01799	County: Monongalia State: WV
Well Type:	Rig: Precision 220	Type of Job: Production Casing

Plugs	Casing Hardware	Physical Slurry Properties						
		Bags of Cement	Fluid Dens (lb/gal)	Excess (cuft/lk)	Yield (cuft/lk)	Mix Water (gal/lk)	Fluid Volume (bbls)	Mix Water (bbls)
13 5/8 PureScrub Spacer with Surfactant	+7.0 PP8 CJX157011+60 0 PP8 CJ111+1.0 GP8 CJFCPC35		13.5				100.00	
14 5/8 Cement	50 % C1010-74+50 % C1910 +0.3 % C1210K+0.2 % C1504+0.2 % CJX157011	4100	14.5	1.15	4.88	853.95	483	
Displacement			8.34			462.83		
0								

Displacement Chemicals:

OPEN HOLE DATA		TUBULAH DATA							
12.25 in. O.H. (2,585 to 2,592 ft)	8.75 in. O.H. (2,592 to 5,250 ft)	5.5 in. 20#, (0 to 20,905 ft)	SIZE WEIGHT	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)

PREVIOUS CASING DATA	PERFORATED INTERVAL DATA				CASING EQUIPMENT DEPTHS			
9,625 in. 40# (0 to 2,585 ft)	TOP	BTM	OFF	SIZE	SHOE	FLOAT	STAGE	ACI*

WELL FLUID		DISPLACEMENT FLUID		OFF PRESS (psi)	CASING PRESS (psi)	MAX PRESS (psi)	WATER ON LOG (psi)	
TYPE	DENSITY	VOLUME	TYPE	DENSITY				
oil base	12.5 ppg	484 bbl	fresh	8.3 ppg	2550	na	8000	2400

Time	Rate (bbl/min)	Csg. Press. (psi)	Trig. Press. (psi)	Ann. Press. (psi)	Slg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details
8:30 PM							0 arrive on location rig having trouble turning casing cant rig in
12:00 AM							0 casing crew is in the way
12:30 AM							0 start spooling trucks
3:00 AM							0 rig up
3:30 AM							0 safely making
3:45 AM							0 rig up rest of foot put bottom plug in head
4:12 AM	4.2	800			100	100	0 psi test 8200 psi
4:35 AM	7	1200			852	952	0 pump pure scrub spacer @ 13.5 ppg
5:34 AM	5	2000			952	952	0 pump cement @ 14.5 ppg verified with pressurized mud scale
5:35 AM	7	1700			952	952	0 reduce rate bottom plug land 370 into cement
6:07 AM	6	2200			952	952	0 resume rate
6:30 AM	5	2200			952	952	0 reduce rate pressure getting close to limit on tools in well
7:00 AM					952	952	0 reduce rate pressure getting close to limit on tools in wellage/in
7:03 AM					952	952	0 shut down wash lines
					952	952	0 open valve to release vacuum on head to get cap off to stuff top plug
					952	952	0 pressure came back and cement flowed back to half round
					952	952	0 when pressure was relieved I pulled the cap to stuff
					952	952	0 cement was not falling
7:15 AM	2	2500			484	1416	0 try to dis place cement not moving
7:20 AM	7	4800			1416	1416	0 aquired permission from company man and tool guy
	6	5500			1416	1416	0 to raise maximum pressure to replace no circulation
	6	4800			1416	1416	0 120 bbl in lower rate to 8 bpm
8:00 AM	6	4800			1416	1416	0 380 bbl in pressure dropped still no circulation
8:37 AM	5	5800			1416	1416	0 plug land hold 5 min 8 bbl back

Left Yard	3/28/19 8:30 PM	Left Loc.	3/28/19 11:30 AM	Start Pump	3/28/19 4:12 AM
Arrived Loc.	8:30pm	Returned Yd	1:30pm	End Pump	3/28/19 8:00 AM
Bumped Plug (psi)	4800	Fluid Differential (psi)	No	PSI Left on Casing	4000
Cement to Surface (bbl)	0	Top of Cement (ft)	na	Full Cts. During Job (Y/N)	No
Mix Pump Pressure (psi)	5800	Casing Rotation		Steady Charge (hrs)	11
Casing Reproduction					

Donald Brown
Service Supervisor

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	5/1/2019
Job End Date:	6/1/2019
State:	West Virginia
County:	Monongalia
API Number:	47-061-01801-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Yost 11H
Latitude:	39.64161400
Longitude:	-80.21837800
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8,211
Total Base Water Volume (gal):	22,238,138
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	Company 1	Carrier/Base Fluid	Water	7732-18-5	100.00000	87.61949	None
Sand (Proppant)	Producers Service Corp	Proppant	Silica Substrate	14808-60-7	100.00000	12.01919	None
StimSTREAM FR 9800	Producers Service Corp	Friction Reducer	copolymer of 2-propenamide	Proprietary	30.00000	0.01634	None
			Petroleum Distillate	64742-47-8	20.00000	0.01089	None
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00109	None
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00109	None
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00054	None
7.5% HCL	Producers Service Corp	Acidizing	Hydrochloric Acid	7647-01-0	7.50000	0.02078	None
BIOC11139A	Producers Service Corp	Biocide	Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00675	None
			Glutaraldehyde	111-30-8	10.00000	0.00225	None

SCAL16486A	Producers Service Corp	Scale Inhibitor	Ethanol	64-17-5	5.00000	0.00113	None
			Ethylene Glycol	107-21-1	30.00000	0.00204	None
			Amine Triphosphate	Proprietary	30.00000	0.00204	None
			Sodium Phosphate	7632-05-5	30.00000	0.00204	None
4-N-1	Producers Service Corp	Inhibitor					
			Acetic acid	64-19-7	90.00000	0.00049	None
			2-Ethylhexanol	104-76-7	10.00000	0.00005	None
			Methanol	67-56-1	10.00000	0.00005	None
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00003	None
			Diethanolamine	111-42-2	1.00000	0.00001	None
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.							
Other Chemical(s)	Listed Above	See Trade Name(s) List					
			Petroleum Distillate	64742-47-8	20.00000	0.01089	
			Glutaraldehyde	111-30-8	10.00000	0.00225	
			Sodium Phosphate	7632-05-5	30.00000	0.00204	
			Amine Triphosphate	Proprietary	30.00000	0.00204	
			Ethanol	64-17-5	5.00000	0.00113	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00109	
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00109	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00054	
			2-Ethylhexanol	104-76-7	10.00000	0.00005	
			Methanol	67-56-1	10.00000	0.00005	
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00003	
			Diethanolamine	111-42-2	1.00000	0.00001	

* 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)

State of West Virginia
Department of Environmental Protection - Office of Oil and Gas
Discharge Monitoring Report
Oil and Gas General Permit

Company Name: Northeast Natural Energy LLC
API No: 47-061-01801 County: Monongalia
District: Clay Well No: 11H
Farm Name: Northeast Natural Energy LLC

Discharge Date/s From:(MMDDYY) NA To: (MMDDYY) NA
Discharge Times. From: _____ To: _____

Total Volume to be Disposed from this facility (gallons): _____
Disposal Option(s) Utilized (write volumes in gallons):

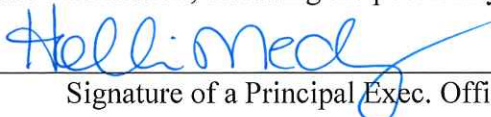
- (1) Land Application: _____ (Include a topographical map of the Area.)
- (2) UIC: _____ Permit No. _____
- (3) Offsite Disposal: _____ Site Location: _____
- (4) Reuse: _____ Alternate Permit Number: _____
- (5) Centralized Facility: _____ Permit No. _____
- (6) Other method: _____ (Include an explanation)

Follow Instructions below to determine your treatment category:

- Optional Pretreatment test: _____ Cl- mg/l _____ DO mg/l
1. Do you have permission to use expedited treatment from the Director or his representative?
(Y/N) _____ If yes, who? _____ and place a four (4) on line 7.
If not go to line 2
 2. Was Frac Fluid or flowback put into the pit? (Y/N) _____ If yes, go to line 5. If not, go to line 3.
 3. Do you have a chloride value pretreatment (see above)? (Y/N) _____ If yes, go to line 4
If not, go to line 5.
 4. Is the Chloride level less than 5000 mg/l? (Y/N) _____ If yes, then enter a one (1) on line 7.
 5. Do you have a pretreatment value for DO? (See above) (Y/N) _____ If yes, go to line 6
If not, enter a three (3) in line 7.
 6. Is the DO level greater than 2.5 mg/l?(Y/N) _____ If yes, enter a two (2) on line 7. If not, enter a three (3) on line 7.
 7. _____ is the category of your pit. Use the Appropriate section.
 8. Comments on Pit condition: Utilized a closed loop system

Name of Principal Exec. Officer: Hollie Medley
Title of Officer: Regulatory Manager
Date Completed: 10/24/19

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this document and all the attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.



Signature of a Principal Exec. Officer or Authorized agent.

Category 1
Sampling Results

API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	5	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl	5,000	_____	5,000	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**			Monitor	_____	mg/l
Oil and Grease			Monitor	_____	mg/l
Total Al***			Monitor	_____	mg/l
TSS			Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume			Monitor	_____	Gal
Flow			Monitor	_____	Gal/min
Disposal Area			Monitor	_____	Acres

*** Al is only reported if the pH is above 9.0

Category 2
Sampling Results

API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	10	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**			Monitor	_____	mg/l
Oil and Grease			Monitor	_____	mg/l
Total Al***			Monitor	_____	mg/l
TSS			Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume			Monitor	_____	Gal
Flow			Monitor	_____	Gal/min
Disposal Area			Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

** Include a description of your aeration technique.

Aeration Code: _____

*** Al is only reported if the pH is above 9.0

Category 3
Sampling Results

API No : _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	20	_____	N/A	N/A	Days
Fe	6	_____	6	_____	mg/l
D.O.	2.5	_____	2.5	_____	mg/l
Settleable Sol.	0.5	_____	0.5	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
Total Al***		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____

** Include a description of your aeration technique.

Aeration Code: _____

*** Al is only reported if the pH is above 9.0.

Category 4
Sampling Results

API No: _____

Parameter	Predischarge		Discharge		Units
	Limits	Reported	Limits	Reported	
pH	6-10	_____	6-10	_____	S.U
Settling Time	1	_____	N/A	N/A	Days
Fe	Monitor	_____	Monitor	_____	mg/l
D.O.	Monitor	_____	Monitor	_____	mg/l
Settleable Sol.	Monitor	_____	Monitor	_____	mg/l
Cl*	12,500	_____	12,500	_____	mg/l
Oil	Trace	_____	Trace	_____	Obs.
TOC**		_____	Monitor	_____	mg/l
Oil and Grease		_____	Monitor	_____	mg/l
TSS		_____	Monitor	_____	mg/l
Total Mn	Monitor	_____	Monitor	_____	mg/l
Volume		_____	Monitor	_____	Gal
Flow		_____	Monitor	_____	Gal/min
Activated Carbon (0.175)		_____	N/A	N/A	lb/B1
Date Site Reclaimed	N/A	N/A			10 days from dis.
Disposal Area		_____	Monitor	_____	Acres

* Can be 25,000 with inspector's approval,

(Inspector's signature): _____

Date: _____