

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

API 47-061-01813 County Monongalia District Clay
Quad Osage, WV Pad Name Bogges Field/Pool Name _____
Farm name Blake R. & H. Preston Bogges Well Number 3H
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 4391543.1 Easting 577768.5
Landing Point of Curve Northing 4391625.4 Easting 577803.1
Bottom Hole Northing 4394990.4 Easting 575778.8

Elevation (ft) 1,266 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 12/18/2018 Date drilling commenced 2/11/19 Date drilling ceased 5/13/19
Date completion activities began 8/31/19 Date completion activities ceased 9/19/19
Verbal plugging (Y/N) N 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 320', 1010', 1125' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 1550', 1900' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 348', 620', 680', 1010' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

Reviewed by:

API 47-061 - 01813 Farm name Blake R. & H. Preston Boggess Well number 3H

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
Surface	17.5	13 3/8	1,208'	N	54.5	NA	Y, 70 bbl
Coal							
Intermediate 1	12.25	9 5/8	2,502'	N	40	NA	Y, 15 bbl
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	21,266	N	20	NA	Y, 45 bbl
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	4500 psi ready mix	35		.75	27	CTS	48
Surface	Class A	1,218	15.6	1.1979	1,459	CTS	8+
Coal							
Intermediate 1	Class A	808	15.2	1.26	1,019	CTS	8+
Intermediate 2							
Intermediate 3							
Production	Class A	4,220	14.5	1.16	4,897	CTS	8+
Tubing							

Drillers TD (ft) 21,282' Loggers TD (ft) 21,252'
 Deepest formation penetrated Marcellus Plug back to (ft) NA
 Plug back procedure NA

Kick off depth (ft) 6,150'

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 - 01813 Farm name Blake R. & H. Preston Boggess Well number 3H

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.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
Marcellus	8,041'	TVD	21,282' MD
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2089 psi Bottom Hole 4458 psi DURATION OF TEST 24 hrs

OPEN FLOW Gas 415 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	
	0		0		See Attached

Please insert additional pages as applicable.

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

Logging Company Schlumberger
Address 4600 Jbarr Court, Suite 200 City Canonsburg State PA Zip 15317

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

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 1/10/2020

Bogges 3H 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	8/30/19	6,257	7,407	9,114	84	550	7,332	302,060	475
2	8/30/19	6,157	6,132	9,058	81	542	9,392	405,880	468
3	8/30/19	5,422	6,299	9,126	80	100	8,610	409,840	464
4	8/31/19	6,297	6,016	8,948	80	429	9,814	401,040	460
5	8/31/19	6,171	6,009	9,134	80	622	9,965	400,840	453
6	8/31/19	5,569	6,076	9,212	82	286	8,898	398,920	453
7	9/1/19	6,095	5,874	9,042	83	50	8,833	397,740	448
8	9/1/19	5,650	5,802	8,936	82	664	9,249	402,520	442
9	9/1/19	5,652	5,891	9,148	82	543	9,048	400,180	436
10	9/1/19	5,723	6,659	9,135	80	65	8,311	406,360	505
11	9/2/19	5,678	6,162	8,825	81	580	9,189	399,840	427
12	9/2/19	5,494	5,070	9,260	82	617	11,156	400,360	422
13	9/3/19	5,488	6,175	9,151	84	50	8,438	401,200	420
14	9/3/19	5,679	6,091	8,710	82	518	9,027	401,140	415
15	9/3/19	5,551	6,375	8,867	81	531	8,908	400,460	413
16	9/4/19	5,468	6,043	8,991	85	44	8,218	400,180	406
17	9/4/19	5,777	5,892	8,956	84	83	8,201	400,280	402
18	9/4/19	5,546	5,993	8,815	83	84	8,445	403,880	397
19	9/4/19	5,179	5,964	8,824	85	35	7,902	401,400	402
20	9/5/19		6,156	8,854	82	84	8,237	401,800	230
21	9/5/19	5,397	5,854	8,759	84	49	8,479	400,220	385
22	9/6/19	5,639	6,336	8,919	85	80	8,598	394,920	380
23	9/6/19	5,976	5,703	8,408	81	465	8,739	398,800	373
24	9/6/19	6,469	5,855	8,370	80	455	8,840	399,840	371
25	9/6/19	5,279	6,290	8,769	84	64	8,367	400,880	364
26	9/26/19	5,773	6,100	8,760	83	78	8,694	397,860	362
27	9/7/19	5,668	6,076	8,483	84	99	8,349	399,360	354
28	9/7/19	5,917	5,871	8,752	84	58	8,281	404,070	357
29	9/8/19	5,742	5,999	8,820	84	45	8,021	399,940	349
30	9/8/19	5,998	5,657	8,460	83	99	8,153	404,860	342
31	9/8/19	5,434	6,617	8,613	84	54	8,044	399,560	339
32	9/9/19	5,330	6,035	8,310	79	58	7,623	400,340	333
33	9/9/19	5,874	6,043	8,243	82	105	7,855	400,240	330
34	9/9/19	5,897	5,826	8,470	84	209	8,178	396,760	333
35	9/10/19	5,781	6,049	8,561	84	72	7,439	404,200	325
36	9/10/19	5,732	6,079	8,542	82	65	7,170	402,520	318
37	9/10/19	6,153	6,212	8,366	84	68	7,330	401,480	315
38	9/10/19	5,556	5,881	8,233	84	63	7,343	400,500	308
39	9/11/19	6,031	6,358	8,410	82	65	7,164	403,250	305
40	9/11/19	5,619	6,709	8,618	83	47	7,596	386,280	300
41	9/11/19	5,797	7,282	8,336	85	340	7,577	407,400	299
42	9/11/19	5,547	5,801	8,317	84	52	6,925	402,220	293
43	9/12/19	5,830	5,987	8,105	84	96	7,907	401,140	293
44	9/12/19	5,869	6,319	7,952	84	49	7,130	397,320	286
45	9/13/19	5,868	6,182	8,136	85	43	7,831	398,640	281
46	9/13/19	5,754	6,172	8,170	84	36	7,391	399,680	271
47	9/7/19	5,757	5,985	8,291	83	42	7,040	398,940	266
48	9/7/19	6,032	5,941	8,090	83	62	6,603	388,800	300
49	9/14/19	5,959	6,136	8,183	84	32	7,748	400,540	255
50	9/14/19	5,730	6,156	8,106	84	30	7,151	401,340	257
51	9/14/19	5,958	6,041	7,887	80	42	6,898	400,760	254
52	9/15/19	6,292	6,137	7,933	81	190	7,041	401,360	241
53	9/15/19	5,495	6,134	7,992	85	40	7,433	400,320	245
54	9/15/19	5,684	6,190	7,956	86	40	7,404	405,260	241
55	9/15/19	5,866	5,905	8,111	83	40	6,986	402,680	233
56	9/16/19	5,791	5,916	7,816	85	48	7,682	400,260	232
57	9/16/19	6,198	6,263	7,960	86	43	7,174	409,680	228
58	9/16/19	5,805	6,028	8,014	85	51	7,234	373,120	240
59	9/17/19	5,585	5,912	7,686	85	53	7,479	401,040	219
60	9/17/19	5,915	6,132	7,638	86	60	6,677	401,320	214
61	9/17/19	5,598	6,323	7,769	85	100	7,707	399,720	210
62	9/17/19	5,689	6,708	7,783	84	46	7,095	401,110	208
63	9/18/19	5,437	6,283	7,965	85	50	6,965	403,080	195
64	9/18/19	6,227	6,639	7,824	85	60	6,757	402,240	194
65	9/18/19	5,933	6,250	7,827	86	60	7,251	404,220	198
66	9/18/19	6,061	6,491	7,948	84	44	7,175	401,900	188

Bogges 3H Perforation Information

Stage Number	Report Date	Cluster 1 Top TD	Cluster 5 Bottom TD	Total Shots
1	8/30/2019	0	21,123	0
2	8/30/2019	21,080	20,931	40
3	8/30/2019	20,887	20,714	40
4	8/31/2019	20,686	20,514	40
5	8/31/2019	20,480	20,318	40
6	8/31/2019	20,291	20,146	40
7	9/1/2019	20,047	19,913	40
8	9/1/2019	19,887	19,733	40
9	9/1/2019	19,701	19,559	40
10	9/1/2019	19,474	19,313	40
11	9/2/2019	19,274	19,114	40
12	9/2/2019	19,066	18,913	40
13	9/3/2019	18,885	18,726	40
14	9/3/2019	18,666	18,500	40
15	9/3/2019	18,462	18,323	40
16	9/4/2019	18,247	18,103	40
17	9/4/2019	18,078	17,911	40
18	9/4/2019	17,887	17,728	40
19	9/4/2019	17,668	17,536	40
20	9/5/2019	17,487	17,309	40
21	9/5/2019	17,243	17,098	40
22	9/6/2019	17,076	16,912	40
23	9/6/2019	16,861	16,749	40
24	9/6/2019	16,675	16,516	40
25	9/6/2019	16,496	16,316	40
26	9/26/2019	16,292	16,128	40
27	9/7/2019	16,072	15,900	40
28	9/7/2019	15,875	15,744	40
29	9/8/2019	15,644	15,540	40
30	9/8/2019	15,463	15,296	40
31	9/8/2019	15,271	15,098	40
32	9/9/2019	15,046	14,903	40
33	9/9/2019	14,860	14,716	40
34	9/9/2019	14,663	14,512	40
35	9/10/2019	14,487	14,308	40
36	9/10/2019	14,263	14,113	40
37	9/10/2019	14,051	13,914	40
38	9/10/2019	13,886	13,739	40
39	9/11/2019	13,674	13,507	40
40	9/11/2019	13,468	13,314	40
41	9/11/2019	13,277	13,095	40
42	9/11/2019	13,080	12,924	40
43	9/12/2019	12,838	12,707	40
44	9/12/2019	12,672	12,499	40
45	9/13/2019	12,482	12,300	40
46	9/13/2019	12,273	12,103	40

47	9/7/2019	12,077	11,893	40
48	9/7/2019	11,879	11,726	40
49	9/14/2019	11,677	11,489	40
50	9/14/2019	11,443	11,289	40
51	9/14/2019	11,257	11,101	40
52	9/15/2019	11,072	10,896	40
53	9/15/2019	10,879	10,696	40
54	9/15/2019	10,630	10,512	40
55	9/15/2019	10,471	10,328	40
56	9/16/2019	10,262	10,093	40
57	9/16/2019	10,076	9,924	40
58	9/16/2019	9,843	9,693	40
59	9/17/2019	9,676	9,493	40
60	9/17/2019	9,468	9,309	40
61	9/17/2019	9,268	9,107	40
62	9/17/2019	9,064	8,892	40
63	9/18/2019	8,860	8,704	40
64	9/18/2019	8,686	8,501	40
65	9/18/2019	8,470	8,347	40
66	9/18/2019	8,256	8,102	40

Boggess Pad Lithology

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	270	Shale/Sand
Sand/silt	270	320	Sand/silt
sand/shale	320	348	sand/shale
coal	348	352	coal
Sand/silt	352	380	Sand/silt
sandstone/limestone	380	500	sandstone/limestone
Sand/silt	500	620	Sand/silt
coal	620	625	coal
Siltstone/Limestone	625	680	Siltstone/Limestone
coal	680	684	coal
Limestone/Siltstone	684	770	Limestone/Siltstone
Siltstone/Shale	770	920	Siltstone/Shale
Sandstone	920	1010	Sandstone
coal	1010	1017	coal
sandstone/siltstone	1017	1280	sandstone/siltstone
sandstone/siltstone	1280	1850	sandstone/siltstone
Red Shale/Siltstone	1850	1970	Red Shale/Siltstone
Limestone	1970	2030	Limestone
Big Injun	2030	2150	Big Injun
sandstone/siltstone	2150	2210	sandstone/siltstone
Gantz	2210	2240	Gantz
siltstone/shale	2240	2510	siltstone/shale
Upper Devonian undifferentiated	2510	6350	Upper Devonian undifferentiated
siltstone/shale	6350	7008	siltstone/shale
Middlesex	7008	7310	Middlesex
Burkett	7310	7640	Burkett
Geneseo	7640	7692	Geneseo
Tully	7692	7745	Tully
Hamilton	7745	7870	Hamilton
Marcellus	7870	TD	Marcellus

Borehole: Original Borehole	Well: Bogness 3H	Field: WV Monongalia County (NAD 83)	Structure: Patterson 334
Gravity & Magnetic Parameters		Surface Location	Miscellaneous
Model: HDGM 2019	Dip: 66.659°	Date: 26-Mar-2019	Lat: N 39 40 12.61
MagDec: -9.264°	FS: 62127.623nT	Gravity FS: 999.334mgN (R.80665 Based)	Northing: 426761.44NUS
			Grid Conv: -0.3784°
			Len: W 90 6 35.83
			Easting: 1801497.311US
			Scale Fact: 0.99994104
			Slot: Bogness 3H
			TVD Ref: KB(1293ft above MSL)
			Plan: Northeast Natural Bogness 3H Gyro-MWD 0' to 2128Z MD

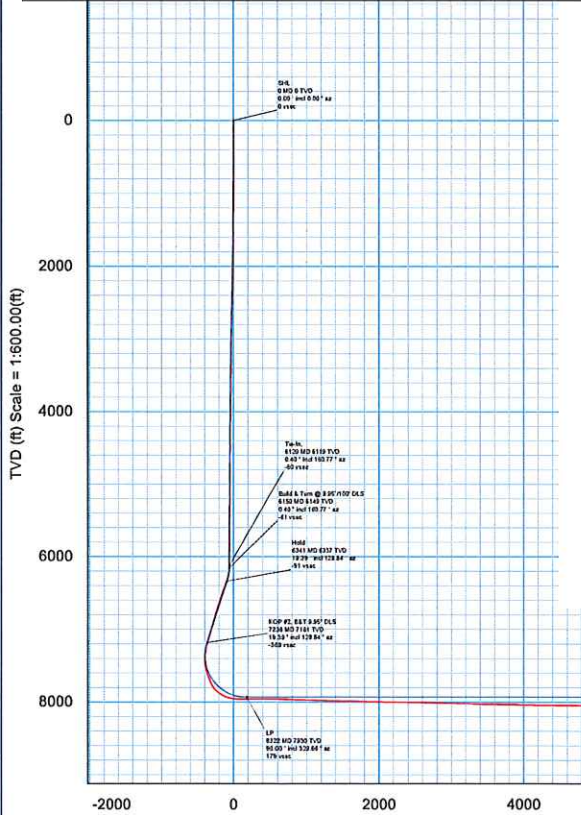
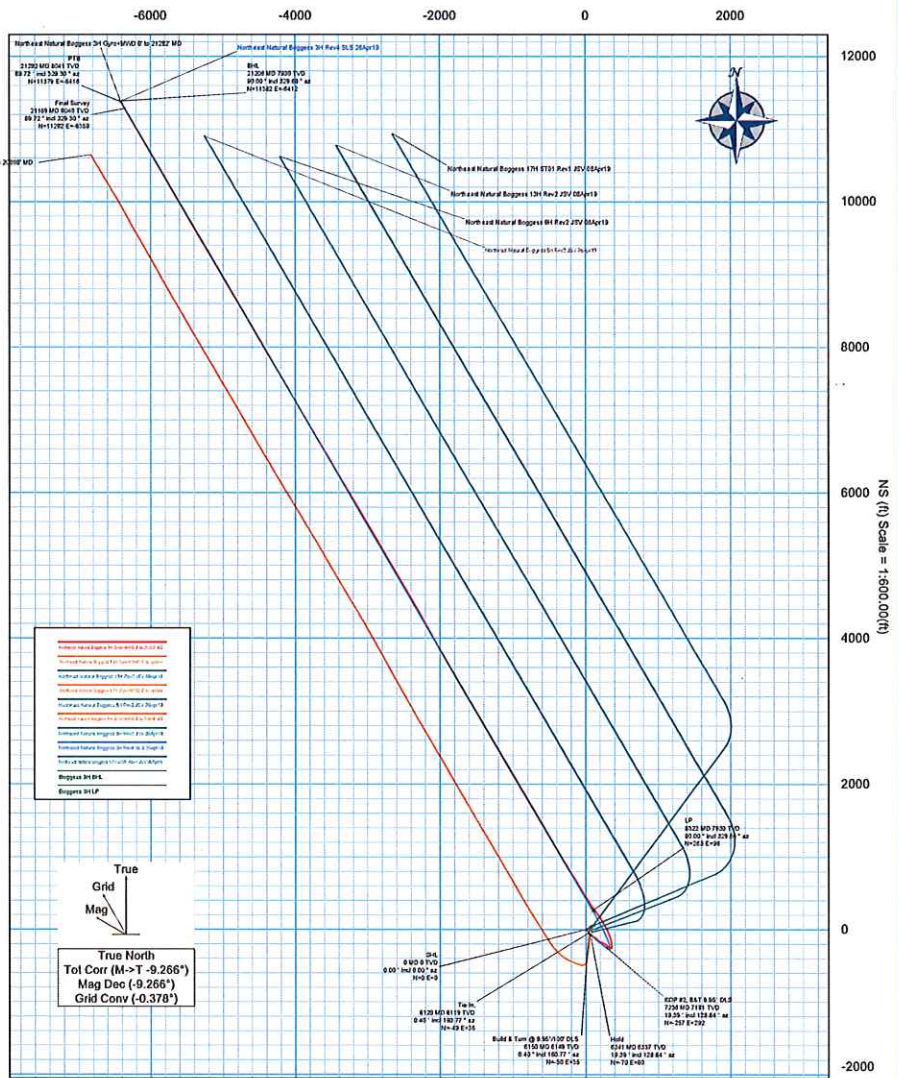
True North

EW (ft) Scale = 1:600.00(ft)

Critical Points							
Critical Point	MD	RCL	AZIM	TVD	VSEC	N(+Y5)	E(+V5)
DIL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Final Survey	21189.00	89.72	329.30	8048.01	1254.43	11222.07	-4307.91
PTB	21392.00	89.72	329.30	8048.57	13061.43	11379.25	-4415.60

PK	Seq	Survey Type	Vendor Tool	MD Start	MD End	Expected MD From	MD To	Survey Frequency	EQI Rate (RPM/Min)	EQI Rate (RPM/Min)	Comments
1	1	NAL_MSD-MSHOT-Depth Only	30	30	0	25	158.475	1.25	1.25		
1	2	NAL_MSD-MSHOT-Depth Only	30	30	25	25	Ad Sta	1.25	1.25		
1	3	NAL_MSD-MSHOT	30	30	25	4110	Ad Sta	14.908	4.657		
1	4	NAL_MWD_16 DEG	30	30	4110	21392	Ad Sta	488.193	17.511		

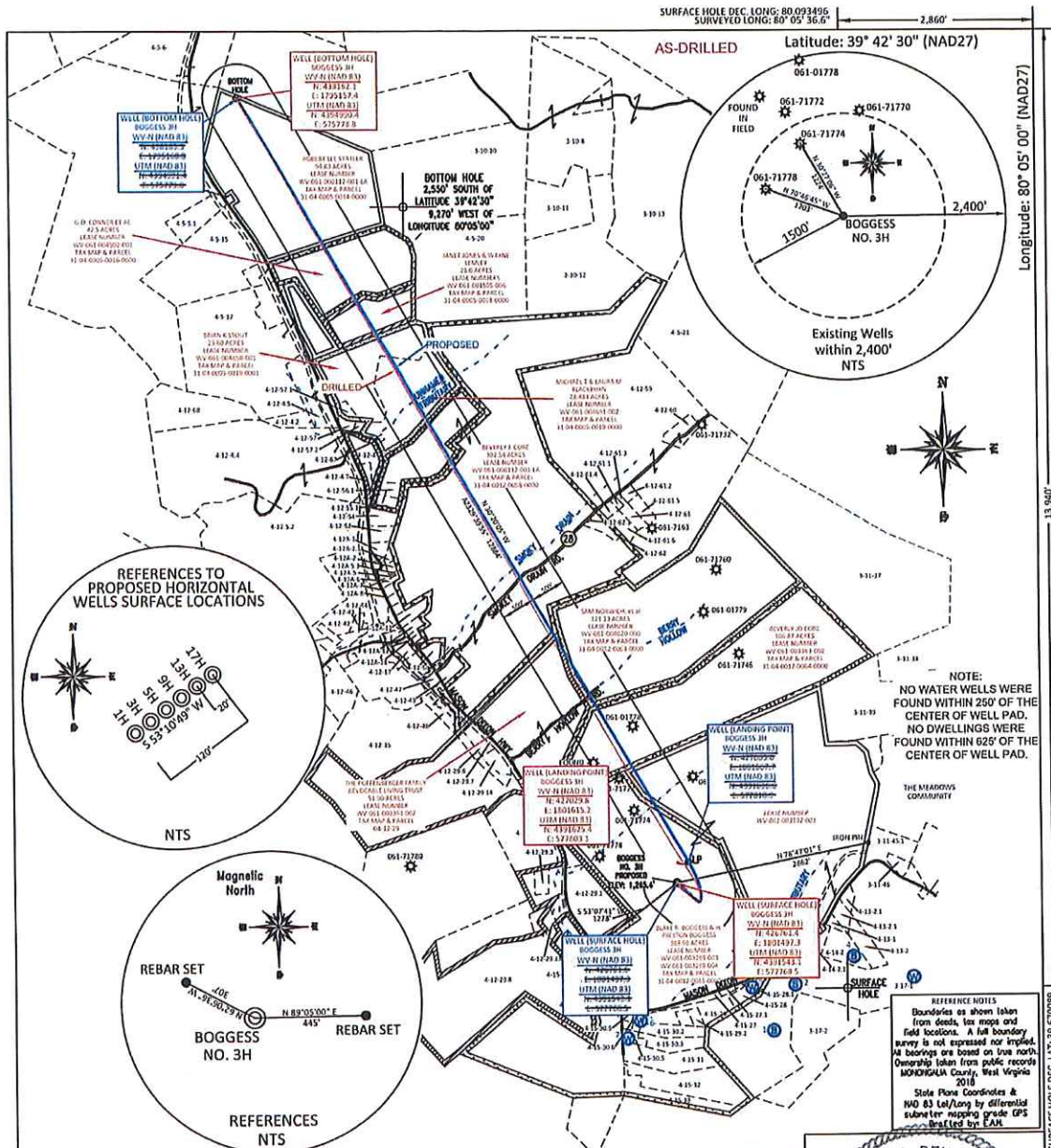
Surface Location							
Northing: 426761.44		Easting: 1801497.31		Latitude: N 39 40 12.61		Longitude: W 90 6 35.83	
VSec Azimuth: 329.66		Target Description		Grid Coord		Local Coord	
Target Name	Shape	Dimension	Latitude	Longitude	Northing	Easting	TVD
Bogness 3H B4	Point	NA	N 39 42 8.03	W 90 6 57.87	431185.30	1795160.80	8074.00
Bogness 3H LP	Point	NA	N 39 40 15.21	W 90 5 34.60	427023.80	1801504.93	8074.00



Vertical Section (ft) Azim = 329.66° Scale = 1:600.00(ft) Origin = 0N/-S, 0E/-W

CONTROLLED

Plan ref	Northeast Natural Bogness 3H Gyro-MWD 0' to 2128Z MD
Drawing ref	
Copy number	01/3
Date	23-Mar-2019
Drawn by	JWaters
Copy number	01



FILE #: NEE14
 DRAWING #: 2863
 SCALE: PLAT: 1" = 2000'
 TCK MARK: 1" = 2000'

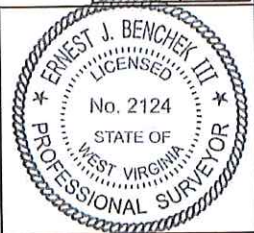
MINIMUM DEGREE OF ACCURACY: 1/200

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

DATE: JANUARY 13, 2020

OPERATOR'S WELL #: BOGGESS NO. 3H

API WELL #: 47 61 47-061-01813
 STATE COUNTY PERMIT

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

WATERSHED: DUNKARD CREEK

COUNTY/DISTRICT: MONONGALIA / CLAY

SURFACE OWNER: BLAKE R. & PRESTON H. BOGGESS

OIL & GAS ROYALTY OWNER: BLAKE R. & PRESTON H. BOGGESS 'et al'

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: 8,041' TMD: 21,282'

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

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: 47-061-01813 County: Monongalia
District: Clay Well No: Bogges 3H
Farm Name: Blake R. & H. Preston Bogges

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: 1/10/2020

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/Bl
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: _____

Borehole: Original Borehole	Well: Bogges 3H	Field: WV Monongalia County (NAD 83)	Structure: Patterson 334
---------------------------------------	---------------------------	--	------------------------------------

Gravity & Magnetic Parameters Model: MOGM 2019 Dip: 68.66° Date: 26-Mar-2019 MagDec: -9.266° FS: 52127.52mT Gravity FS: 999.334mgm (9.80665 Based)	Surface Location NAD83 West Virginia State Plane, Northern Zone, US Feet Lat: N 39 40 12.61 Northing: 428761.41NUS Grid Conv: -0.3764° Lon: W 80 9 35.83 Easting: 1801497.31NUS Scale Fact: 0.99994104	Miscellaneous Slot: Bogges 3H TVD Ref: KB(1293ft above MSL) Plan: Northeast Natural Bogges 3H Gyro+MWD 0' to 2128' MD
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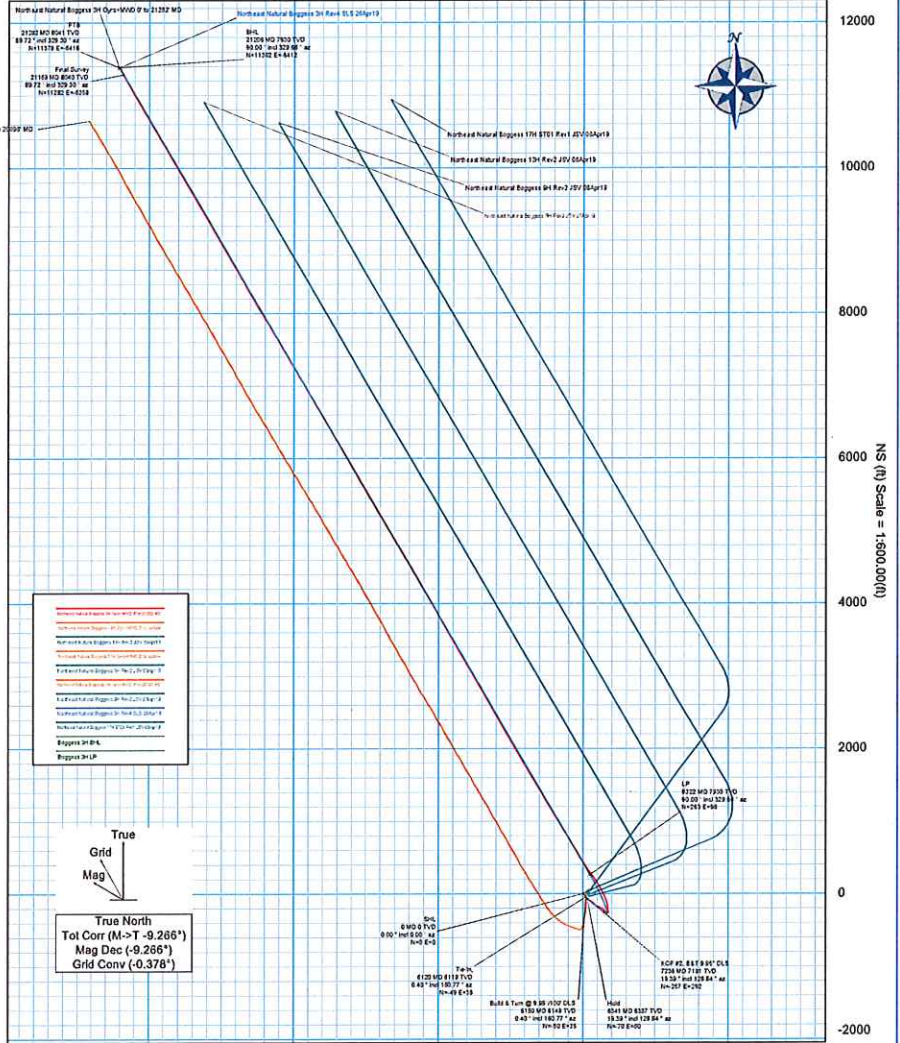
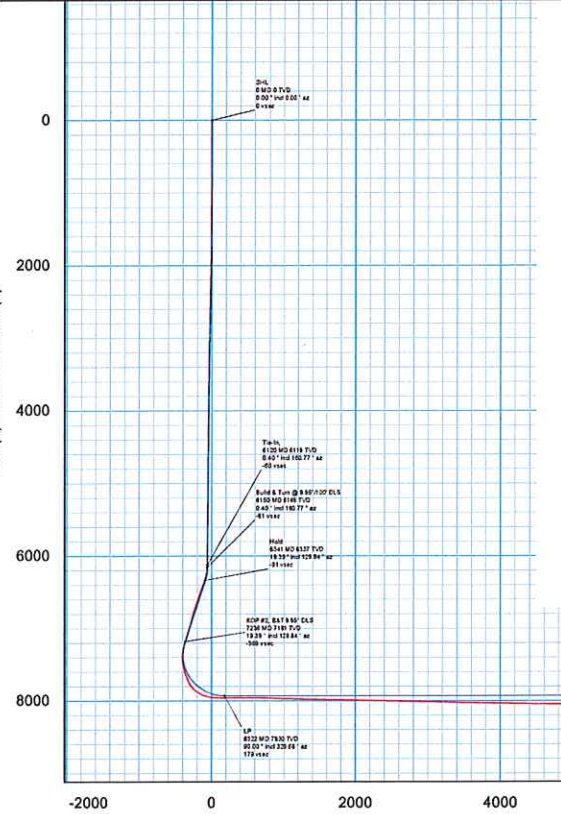
True North

EW (ft) Scale = 1:600.00(ft)

Critical Points							
Critical Point	MD	INCL	AZIM	TVD	VSEC	N(V)54	E(V)54
DHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Final Survey	2119.00	89.72	329.30	8045.01	12041.48	-11322.07	-4287.81
FTS	2128.00	89.72	329.30	8045.57	12051.48	-11379.23	-4413.05

PS#	Seq	Survey Tool	Vendor/Tool	MD From (ft)	MD To (ft)	Survey Frequency (Hz)	EW Rate (ft/min)	EW Size (ft)	EW Size (ft)	Comments/Contingency
1	1	NAL_NDQ-MWD/Depth Only	30 30	0	25	150	425	1.25	1.25	
1	2	NAL_NDQ-MWD/Depth Only	30 30	25	35	150	425	1.25	1.25	
1	3	NAL_NDQ-MWD/Depth Only	30 30	35	110	150	425	1.25	1.25	
1	4	NAL_NDQ-MWD/Depth Only	30 30	110	2128	150	425	1.25	1.25	

Surface Location									
Northing	Easting	Latitude	Longitude	VSec Azimuth	329.68				
427914.4	1801497.31	N 39 40 12.61	W 80 9 35.83	VSec Azimuth	329.68				



True North
Mag Dec (-9.266°)
Grid Conv (-0.376°)

CONTROLLED

Plan title: Northeast Natural Bogges 3H Gyro+MWD 0' to 2128' MD
Drawing no: 04-01-2019
Copy number: #3
Date: 03-Jun-2019
Drawn by: JZ
Checked by: JZ

Vertical Section (ft) Azim = 329.66° Scale = 1:600.00(ft) Origin = 0N/-S, 0E/-W

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	8/30/2019
Job End Date:	9/18/2019
State:	West Virginia
County:	Monongalia
API Number:	47-061-01802-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Bogges 3H
Latitude:	39.67008900
Longitude:	-80.09349600
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8,020
Total Base Water Volume (gal):	22,160,346
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			100.00000	87.31053	None
Sand (Proppant)	Producers Service Corp	Proppant					
StimSTREAM FR 9800	Producers Service Corp	Friction Reducer			100.00000	12.43354	None
			copolymer of 2-propenamide	Proprietary	30.00000	0.01487	None
			Petroleum Distillate	64742-47-8	20.00000	0.00992	None
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00099	None
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00099	None
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00050	None
7.5% HCL	Producers Service Corp	Acidizing					
BIOC1139A	Producers Service Corp	Biocide			7.50000	0.01337	None
			Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00658	None
			Glutaraldehyde	111-30-8	10.00000	0.00219	None

SCAL16486A	Producers Service Corp	Scale Inhibitor	Ethanol	64-17-5	5.00000	0.00110	None
			Amine Triphosphate	Proprietary	30.00000	0.00175	None
			Ethylene Glycol	107-21-1	30.00000	0.00175	None
			Sodium Phosphate	7632-05-5	30.00000	0.00175	None
4-N-1	Producers Service Corp	Inhibitor					
			Acetic acid	64-19-7	90.00000	0.00031	None
			Methanol	67-56-1	10.00000	0.00003	None
			2-Ethylhexanol	104-76-7	10.00000	0.00003	None
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00002	None
			Diethanolamine	111-42-2	1.00000	0.00000	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	0.00992	
			Glutaraldehyde	111-30-8	10.00000	0.00219	
			Amine Triphosphate	Proprietary	30.00000	0.00175	
			Sodium Phosphate	7632-05-5	30.00000	0.00175	
			Ethanol	64-17-5	5.00000	0.00110	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00099	
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00099	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00050	
			Methanol	67-56-1	10.00000	0.00003	
			2-Ethylhexanol	104-76-7	10.00000	0.00003	
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00002	
			Diethanolamine	111-42-2	1.00000	0.00000	

* 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)

BJ Cementing Treatment Report

SERVICE SUPERVISOR	Harry Tarma	FORMATION	Marcellus Shale
CLIENT FIELD REPRESENTATIVE	NATHAN	RIG	Highlands 8
DISTRICT	Massillon, OH	COUNTY	MONONGALIA
SERVICE	Cementing	STATE / PROVINCE	WV

WELL GEOMETRY

TYPE	OD (in)	ID (in)	WEIGHT (lb/ft)	MD (ft)	TVD (ft)	EXCESS (%)	GRADE	THREAD
Previous Casing	24.00	23.25	94.58	40.00	40.00			
Open Hole	0.00	17.50	0.00	1,268.00	1,268.00	60.00		
Casing	13.38	12.62	54.50	1,208.00	1,208.00			

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Bottom Plug Provided By		Tool Depth (ft)	1,164.00
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)	2500.00
Top Plug Size	13.375	Max Casing Pressure - Operated (psi)	2000.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity	10.00	Job Pumped Through	Manifold
Centralizers Type	Bow	Top Connection Thread	BTC
Landing Collar Depth (ft)	1,164	Top Connection Size	13.375

CIRCULATION PRIOR TO JOB

Well Circulated By	Rig
Circulation Prior to Job	No
Circulation Time (min)	0.00
Circulation Rate (bpm)	0.00
Circulation Volume (bbbls)	0.00
Lost Circulation Prior to Cement Job	No
Mud Density In (ppg)	
Mud Density Out (ppg)	
PV Mud In	
PV Mud Out	

YP Mud In	
YP Mud Out	
Solids Present at End of Circulation	No
10 sec SGS	
10 min SGS	
30 min SGS	
Flare Prior to / during the Cement Job	No
Gas Present	No
Gas Units	

TEMPERATURE

Ambient Temperature (°F)	34.00
Mix Water Temperature (°F)	60.00

Slurry Cement Temperature (°F)	65.00
Flow Line Temperature (°F)	

FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H ₂ O REQ (gals/sk)	VOL (sk)	VOL (Cu Ft)	VOL (bbbls)
Spacer / Pre Flush / Flush	Fresh Water	8.3400					10.0000
Spacer / Pre Flush / Flush	Gel Spacer	8.6100					25.0000
Spacer / Pre Flush / Flush	Fresh Water	8.3400					10.0000
Tail Slurry	Cement Slurry	15.6000	1.1979	5.23	1218	1459.0000	259.7000
Displacement Final	Fresh Water	8.3400				0.0000	187.1000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer / Pre Flush / Flush	Gel Spacer	IntegraSeal POLI	1.0000	PPB
Spacer / Pre Flush / Flush	Gel Spacer	EXTENDER, BENTONITE	20.0000	PPB
Spacer / Pre Flush / Flush	Gel Spacer	Fresh Water	100.0000	PCT
Tail Slurry	Cement Slurry	CEMENT, CLASS A	100.0000	PCT
Tail Slurry	Cement Slurry	IntegraSeal POLI	0.2500	LBS/SK
Tail Slurry	Cement Slurry	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	2.0000	BWOB

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL (bbbls)	PIPE PRESSURE (psi)	ANNULUS PRESSURE (psi)	COMMENTS
2/11/2019 2:38:00 PM	Fresh Water	5.50	190.00	184.00		
2/11/2019 3:50:00	Gel Spacer	5.00	25.00	162.00		

PM						
2/11/2019 3:57:00 PM	Fresh Water	4.00	10.00	145.00		
2/11/2019 4:00:00 PM	Cement Slurry	5.00	259.70	213.00		
2/11/2019 5:22:00 PM	Fresh Water	5.60	180.00	210.00		

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	145.00	590.00	355.00
Rate (bpm)	2.80	6.50	5.20

DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	70.00
Calculated Displacement Vol (bbls)	179.80	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	180.00	Amt of Spacer to Surface	75.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	0.50
Bump Plug Pressure (psi)	1033.00	Total Volume Pumped (bbls)	664.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement Returns During Job	Full	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

70 bbls of cement back to surface

JOB SUMMARY

BJ Cementing Treatment Report

SERVICE SUPERVISOR	Matthew Deel	FORMATION	Marcellus Shale
CLIENT FIELD REPRESENTATIVE	Nathan Caldwell	RIG	Highlands 8
DISTRICT	Massillon, OH	COUNTY	MONONGALIA
SERVICE	Cementing	STATE / PROVINCE	WV

WELL GEOMETRY

TYPE	OD (in)	ID (in)	WEIGHT (lb/ft)	MD (ft)	TVD (ft)	EXCESS (%)	GRADE	THREAD
Previous Casing	13.38	12.62	54.50	1,203.00	1,250.00			
Open Hole		12.25		2,550.00	2,550.00	40.00		
Casing	9.63	8.84	40.00	2,502.00	2,500.00			

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Bottom Plug Provided By		Tool Depth (ft)	2,456.00
Bottom Plug Size		Max Tubing Pressure - Rated (psi)	
Top Plug Used?	Yes	Max Tubing Pressure - Operated (psi)	
Top Plug Provided By	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)	2,456	Top Connection Size	9.625

CIRCULATION PRIOR TO JOB

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

TEMPERATURE

Ambient Temperature (°F)	42.00	Slurry Cement Temperature (°F)	52.00
Mix Water Temperature (°F)	44.00	Flow Line Temperature (°F)	

FLUID DETAILS

FLUID TYPE	FLUID NAME	DENSITY (ppg)	YIELD (Cu Ft/sk)	H ₂ O REQ (gals/sk)	VOL (sk)	VOL (Cu Ft)	VOL (bbls)
Spacer / Pre Flush / Flush	Gel Spacer	8.6100					25.0000
Spacer / Pre Flush / Flush	Fresh Water	8.3400					10.0000
Tail Slurry	Cement Slurry	15.2000	1.2618	5.75	808	1019.0000	181.4000
Displacement Final	Fresh Water	8.3400				0.0000	186.5000

FLUID TYPE	FLUID NAME	COMPONENT	CONCENTRATION	UOM
Spacer / Pre Flush / Flush	Gel Spacer	EXTENDER, BENTONITE	20.0000	PPB
Spacer / Pre Flush / Flush	Gel Spacer	Fresh Water	100.0000	PCT
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
2/14/2019 1:57:00 PM	Gel Spacer	5.00	25.00	200.00		
2/14/2019 2:02:00 PM	Fresh Water	5.00	10.00	200.00		
2/14/2019 4:05:00 PM	Cement Slurry	4.10	189.00	144.00		



2/14/2019 2:54:00 PM	Fresh Water	4.00	186.50	1032.00	
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MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	144.00	1032.00	394.00
Rate (bpm)	4.00	5.00	4.53



DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	15.00
Calculated Displacement Vol (bbls)	186.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	186.50	Amt of Spacer to Surface	25.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	0.50
Bump Plug Pressure (psi)	1372.00	Total Volume Pumped (bbls)	590.00
Were Returns Planned at Surface	Yes	Top Out Cement Spotted	No
Cement Returns During Job	Full	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



Cement Job Log

C&J ENERGY SERVICES		Date: 5/12/2019		Serv. Supervisor: Donald Brown						
Customer: NORTHEAST NATURAL ENERGY LLC		Ticket #: JWV1905-0008		Serv. Center: Jane Lew - 3044						
Cust. Rep.: Josh Grimm		API Well #: 47-001-01813		County: Monongalia State: WV						
Lease: Boggess 3H		Rig: Patterson 334		Type of Job: Production Casing						
Well Type:		Materials Furnished by C&J ENERGY SERVICES								
Plugs		Casing Hardware		Physical Property Properties						
		Sacks of Cement	Field Dens (lb/gal)	Excess Yield (cuft/sk)	Mix Water (gal/sk)	Free Volume (bbl/s)	Mix Water (bbl/s)			
13.5# PureScrub Spacer with Surfactant	+7.0 PPB CIX157011+55.0 PPB CJ111+1.0 GFB CUREO		13.5			100.00				
14.5# Cement	50 % CQ10-74+50 % CQ910 +0.2 % CJ210K+0.25 % CJS04+0.2 % CIX157011+0.5 % CJ415	4220	14.5	1.16	4.89	871.50	492			
Displacement			8.34			470.99				
0										
Displacement Chemicals:										
OPEN HOLE DATA		TUBULAR DATA								
12.25 in. O.H. (2,502 to 2,550 ft) 8.75 in. O.H. (2,350 to 8,150 ft) 8.5 in. O.H. (6,150 to 21,266 ft)		SIZE WEIGHT	THREAD	DEPTH (ft)	GRADE	ID (in)	BURST (psi)	COLLAPSE (psi)		
5.5 in. 20#, (0 to 21,266 ft)										
PREVIOUS CASING DATA		PERFORATED INTERVAL DATA			CASING EQUIPMENT DEPTHS					
9.625 in. 40# (0 to 2,502 ft)		TOP	BTM	SPF	SIZE	SHOE	FLOAT	STAGE	ACP	
WELL FLUID		DISPLACEMENT FLUID		DIFF PRESS (psi)	CAS LEFT (psi)	MAX PRESS (psi)		WATER ON LOG (psi)		
TYPE	DENSITY	VOLUME	TYPE	DENSITY						
oil base	12.5 ppg	471 bbl	fresh	8.3 ppg	2600	6500		1900		
Time	Rate (bbl/min)	Csg. Press. (psi)	Tbg. Press. (psi)	Annl. Press. (psi)	Stg. Vol. (bbl)	Cum. Vol. (bbl)	Stage Details			
7:30 PM							0 arrive on location			
							0 wait on rig to finish casing casing floating going slow			
2:30 AM							0 spot trucks rig in			
							0 waiting on rig to finish casing and break air lock			
11:30 AM							0 safety meeting			
12:25 PM							0 psi test 6500 psi drop bottom plug			
12:30 PM	4	1500				100	100 pump spacer @ 13.5 ppg			
12:49 PM	8.9	1740				872	972 pump cement @ 14.5 ppg verified with seals			
1:37 PM	5	1940				972	972 slow rate for bottom plug landed 388 into cement			
2:48 PM						972	972 shut down to wash lines and drop plug wash up manifold plugged			
						972	972 hook up different line to half round			
3:05 PM	7	3200				472	1444 pump fresh water displacement			
3:20 PM	7	4900				1444	1444 pressure at 4900 180 bbl in			
4:26 PM	4	5000				1444	1444 land plug hold for 5 min			
4:31 PM						1444	1444 release pressure 7 bbl back			
4:32 PM	2	5000				7	1451 bump pressure back up hold for 5 min			
4:37 PM						1451	1451 release pressure 7 bbl back			
							100 bbl spacer back & 45 bbl cement back			
4:40 PM							wash pump & rig stack until rig verified clean stop pumping			
Left Yard	5/11/19 5:00 PM	Left Loc.	5/12/19 6:30 PM	Start Pump	5/12/19 12:23 PM					
Arrived Loc.	5/11/19 7:00 PM	Returned Yd.	5/12/19 7:30 PM	End Pump	5/12/19 4:26 PM					
Bumped Plug (psi)	Final Differential (psi)	Flashes Held (Y/N)	PSI Lost on Casing	Cement to Surface (bbl)	Top of Cement (ft)	Full Ctn. During Job (Y/N)	Max Pump Pressure (psi)	Casing Rotation	Standby Charges (hrs)	Casing Rpt/Location
Yes	4700	Yes	0	45	0	Yes	5000	20		
Donald Brown										
Service Supervisor										Date