

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

API 47 - 061 - 01802 County Monongalia District Clay
Quad Osage, WV Pad Name Boggess Field/Pool Name _____
Farm name Blake R. & H. Preston Boggess Well Number 5H
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 4391546.9 Easting 577773.2
Landing Point of Curve Northing 4391782.9 Easting 577975.8
Bottom Hole Northing 4394848.6 Easting 576132.8

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 2/1/19 Date drilling ceased 5/24/19
Date completion activities began 8/6/19 Date completion activities ceased 8/30/19
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 - 01802 Farm name Blake R. & H. Preston Boggess Well number 5H

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	1,211	N	54.5	NA	Y, 10 bbl
Coal							
Intermediate 1	12.25	9 5/8	2,537	N	40	NA	Y, 20 bbl
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	20,238	N	20	NA	Y
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	1.19	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	4005	14.5	1.16	4,633	27'	8+
Tubing							

Drillers TD (ft) 20,257' Loggers TD (ft) 20,227'
 Deepest formation penetrated Marcellus Plug back to (ft) NA
 Plug back procedure NA

Kick off depth (ft) 6,299'

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 _____

Bogges 5H Perforation Information

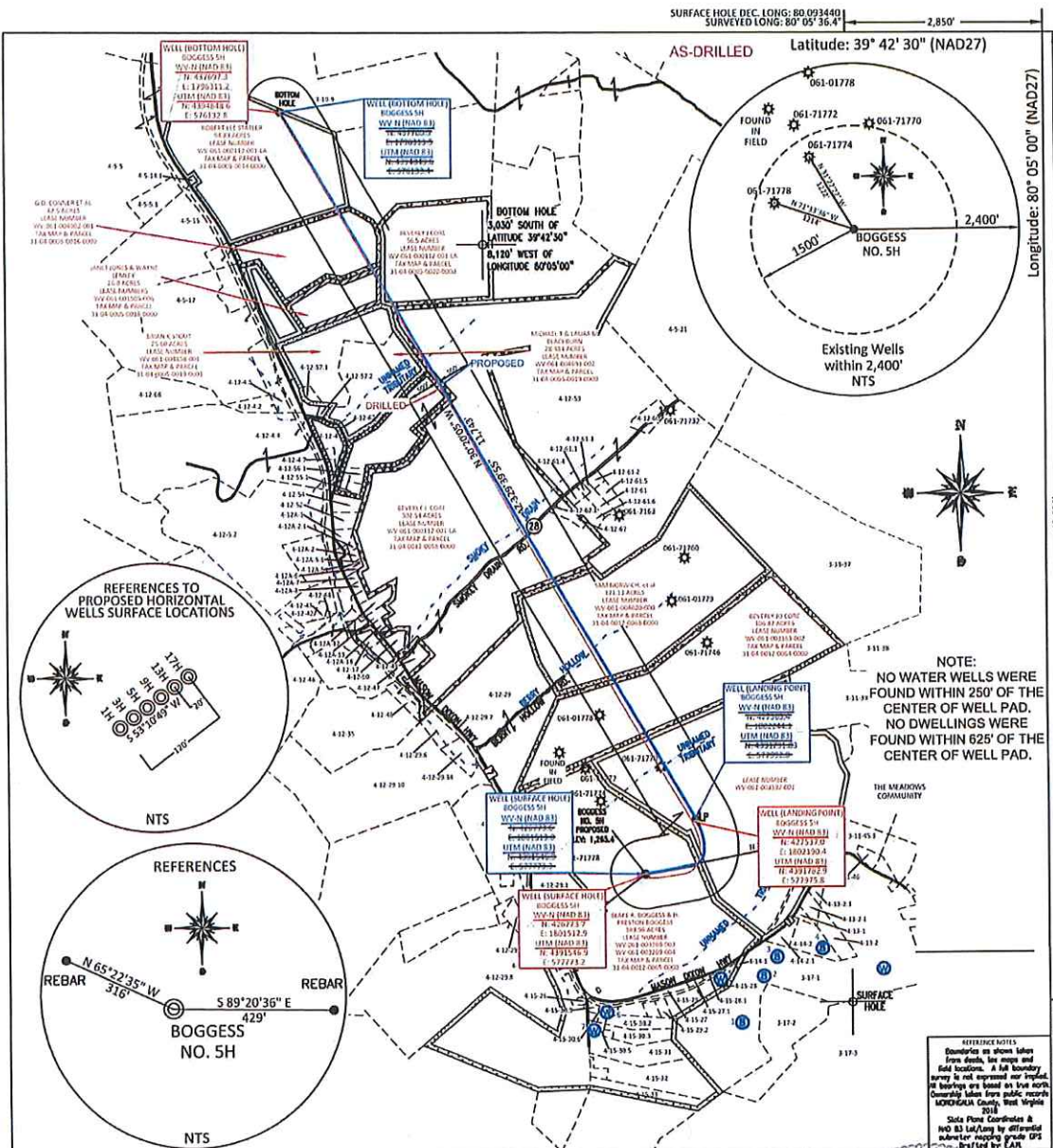
Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	8/7/19	19,384	0	32
2	8/7/19	19,179	19,318	32
3	8/8/19	18,984	19,097	32
4	8/9/19	18,790	18,905	32
5	8/9/19	18,604	18,706	32
6	8/10/19	18,405	18,523	32
7	8/10/19	18,183	18,330	32
8	8/10/19	17,996	18,095	32
9	8/11/19	17,816	17,921	32
10	8/11/19	17,602	17,740	32
11	8/11/19	17,406	17,519	32
12	8/12/19	17,209	17,332	32
13	8/12/19	17,007	17,122	32
14	8/13/19	16,806	16,938	32
15	8/13/19	16,605	16,726	32
16	8/13/19	16,387	16,523	32
17	8/14/19	16,166	16,302	32
18	8/14/19	15,996	16,124	32
19	8/14/19	15,806	15,917	32
20	8/15/19	15,595	15,720	32
21	8/16/19	15,371	15,495	32
22	8/16/19	15,172	15,294	32
23	8/16/19	14,985	15,095	32
24	8/17/19	14,791	14,889	32
25	8/17/19	14,628	14,717	32
26	8/18/19	14,449	14,551	32
27	8/18/19	14,232	14,354	32
28	8/18/19	13,912	14,150	32
29	8/19/19	13,588	13,715	32
30	8/19/19	13,379	13,504	32
31	8/19/19	13,163	13,297	32
32	8/20/19	12,957	13,079	32
33	8/20/19	12,751	12,868	32
34	8/21/19	12,611	12,718	32
35	8/21/19	12,385	12,520	32
36	8/21/19	12,187	12,303	32
37	8/22/19	11,981	12,098	32
38	8/22/19	11,789	11,893	32
39	8/23/19	11,630	11,733	40
40	8/19/19	11,372	11,513	32
41	8/24/19	11,170	11,295	32
42	8/19/19	10,956	11,090	32
43	8/24/19	10,734	10,877	32
44	8/24/19	10,562	10,667	32
45	8/25/19	10,394	10,497	32
46	8/19/19	10,182	10,302	32
47	8/24/19	9,976	10,098	32
48	8/26/19	9,766	9,882	32
49	8/26/19	9,566	9,682	32
50	8/26/19	9,354	9,484	32
51	8/27/19	9,137	9,264	32
52	8/27/19	8,952	9,060	32
53	11/27/19	8,762	8,873	32
54	8/28/19	8,560	8,676	32
55	8/28/19	8,352	8,479	32

Bogges 5H 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	8/7/19	5,427	7,192	8,277	81	575	6,251	300,740	432
2	8/7/19	6,533	6,037	8,993	83	650	8,124	400,680	430
3	8/8/19	5,433	6,179	8,923	84	515	8,441	400,340	425
4	8/9/19	5,710	6,213	9,561	79	487	8,235	406,760	424
5	8/9/19	6,033	6,211	9,374	73	586	8,123	400,000	420
6	8/10/19	5,850	6,258	8,874	81	193	7,974	404,480	415
7	8/10/19	5,681	5,786	8,636	81	65	7,372	401,520	414
8	8/10/19	6,600	6,181	8,803	79	497	7,817	400,480	402
9	8/11/19	6,071	6,384	9,484	76	525	8,062	408,020	399
10	8/11/19	5,790	6,004	9,036	80	75	7,180	405,560	394
11	8/11/19	5,668	6,546	8,786	79	309	4,819	168,220	396
12	8/12/19	5,852	6,170	8,709	81	40	7,671	400,620	385
13	8/12/19	5,799	6,108	9,042	79	38	7,983	368,300	389
14	8/13/19	5,771	6,234	8,992	78	425	7,946	399,680	382
15	8/13/19	5,667	6,093	8,672	79	60	7,637	402,820	371
16	8/13/19	5,729	5,984	8,728	80	55	7,042	380,300	369
17	8/14/19	6,072	5,866	8,751	79	445	7,775	399,900	362
18	8/14/19	5,207	5,777	9,056	80	50	6,331	325,840	358
19	8/14/19	5,742	5,907	9,080	77	40	7,597	199,920	352
20	8/15/19	5,340	6,557	8,548	82	549	7,629	404,460	348
21	8/16/19	5,311	5,880	8,524	80	295	8,254	400,160	348
22	8/16/19	5,121	6,009	8,873	78	60	8,227	399,720	340
23	8/16/19	5,330	6,006	8,453	79	229	8,619	399,840	337
24	8/17/19		6,046	8,301	79	62	6,926	376,500	1,113
25	8/17/19	6,226	6,026	8,312	80	67	7,770	401,380	330
26	8/18/19		5,640	8,320	77	464	7,834	371,340	180
27	8/18/19	5,623	5,927	8,135	80	85	8,905	400,000	320
28	8/18/19	5,760	5,940	8,223	78	464	4,002	68,080	312
29	8/19/19	5,365	6,473	8,293	80	31	8,293	404,400	300
30	8/19/19	5,388	6,351	8,543	80	82	7,973	397,040	300
31	8/19/19	5,341	6,190	8,387	79	45	7,494	394,080	310
32	8/20/19	5,098	6,148	8,513	80	50	8,141	400,740	289
33	8/20/19	5,726	6,083	8,086	79	64	8,146	403,900	287
34	8/21/19	5,944	6,250	7,771	74	47	8,053	347,240	287
35	8/21/19	5,548	6,209	8,331	80	25	7,997	400,960	280
36	8/21/19	5,415	6,496	8,283	77	49	8,369	400,260	273
37	8/22/19	5,561	6,512	8,330	79	32	7,957	400,140	270
38	8/22/19	6,036	6,288	8,025	80	31	8,924	398,360	269
39	8/23/19	5,600	5,409	8,180	81	50	8,143	399,380	262
40	8/19/19	5,425	6,151	8,477	81	90	7,607	354,960	254
41	8/24/19	5,928	6,435	8,331	79	75	7,800	400,580	252
42	8/19/19	5,382	6,742	8,400	81	53	7,292	347,660	252
43	8/24/19	5,661	6,557	8,126	80	39	7,872	405,080	245
44	8/24/19	5,688	6,618	8,006	80	26	7,731	401,280	240
45	8/25/19	5,465	6,429	8,155	80	50	8,335	400,860	235
46	8/19/19	5,518	6,420	7,970	80	75	8,197	396,200	231
47	8/24/19	5,539	6,239	7,915	80	34	7,492	407,860	239
48	8/26/19	5,299	6,388	8,123	79	44	7,745	404,860	221
49	8/26/19	5,818	6,539	7,657	79	195	7,983	400,520	218
50	8/26/19	5,300	6,617	7,901	81	40	7,691	404,420	211
51	8/27/19	5,744	6,464	7,627	79	62	7,750	403,160	208
52	8/27/19	5,582	7,039	8,195	79	130	7,888	399,360	208
53	11/27/19	5,338	6,780	7,702	80	50	7,660	399,660	199
54	8/28/19	5,385	7,270	7,270	80	43	7,818	403,940	191
55	8/28/19	5,426	7,053	7,891	78	70	7,780	401,060	234

Bogges 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



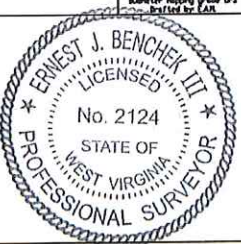
FILE #: NEE14
 DRAWING #: 2864
 SCALE: PLAT: 1" = 2000'
 TICK MARK: 1" = 2000'

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 WVDEP

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

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

WATERSHED: DUNKARD CREEK

COUNTY/DISTRICT: MONONGALIA / CLAY

SURFACE OWNER: BLAKE R. & PRESTON H. BOGCESS

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

LEASE NUMBERS:

DATE: JANUARY 13, 2020

OPERATOR'S WELL #: BOGCESS NO. 5H

API WELL #: 47 61 47-061-01690
 STATE COUNTY PERMIT

AS-BUILT ELEVATION: 1,266.2'

QUADRANGLE: OSAGE, WV

ACREAGE: 389.96 +/-
 1194.41 +/-

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: 8,039' TMD: 20,257'

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

SURFACE HOLE DEC. LONG: 80.093440 SURVEYED LONG: 80° 05' 36.4"

Borehole: Original Borehole	Well: Bogness 5H	Field: WV Monongalia County (NAD 83)	Structure: Patterson 334
Gravity & Magnetic Parameters Model: HDGM 2019 Dip: 66.855° Date: 10-May-2019 MagDec: -8.266° FS: 62114.463nT Gravity FS: 999.334mg (8.60665 Based)		Surface Location HAD3 West Virginia State Plane, Northern Zone, US Feet Lat: N 39 40 12.73 Northing: 428773.730US Grid Conv: -0.3783° Lon: W 80 6 35.63 Easting: 1801512.870US Scale Fact: 0.89994104	
Miscellaneous Slot: Bogness 5H TVD Ref: KB(1293ft above MSL) Plan: Northeast Natural Bogness 5H Gyro+MVD G to 20257 MD			

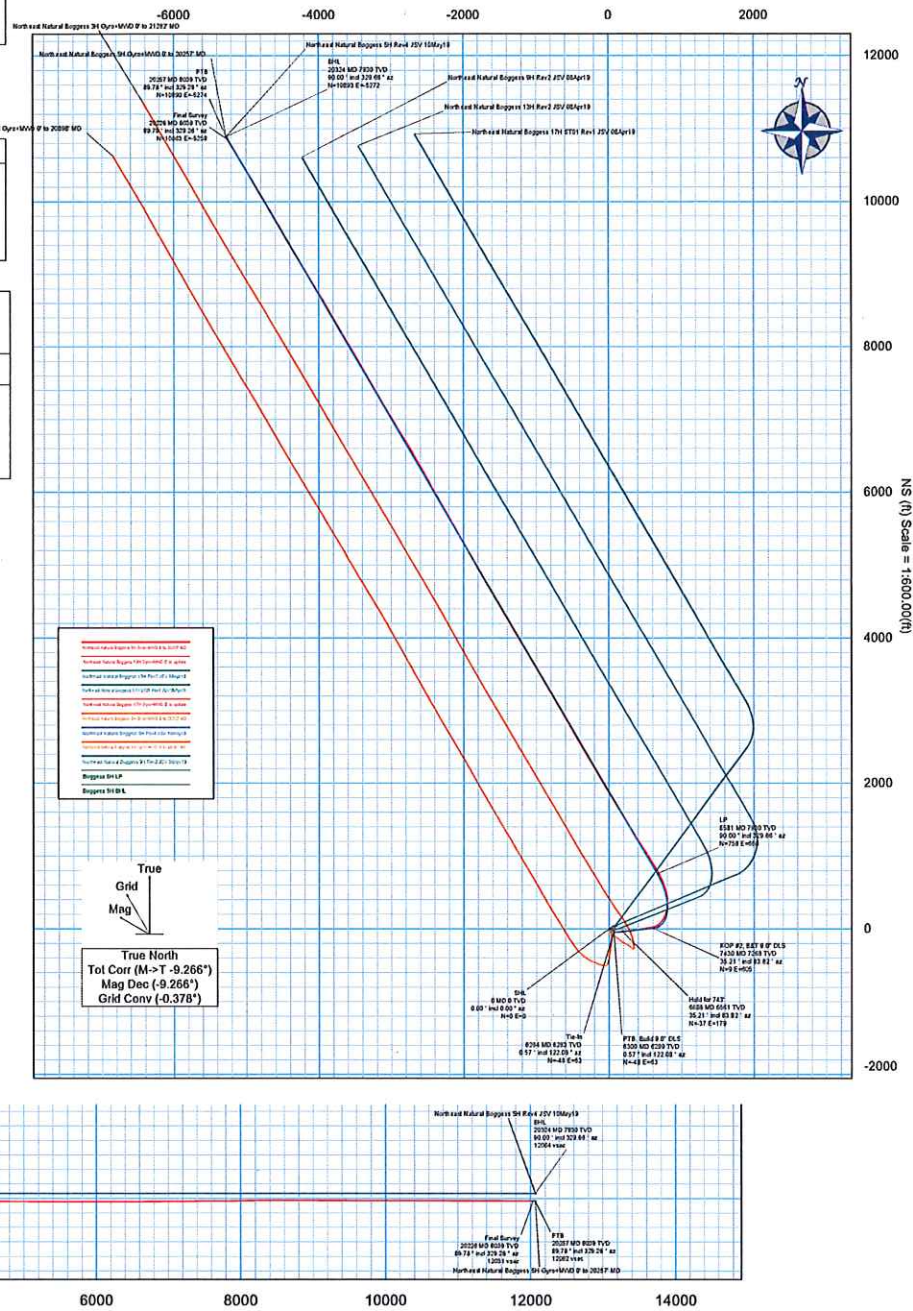
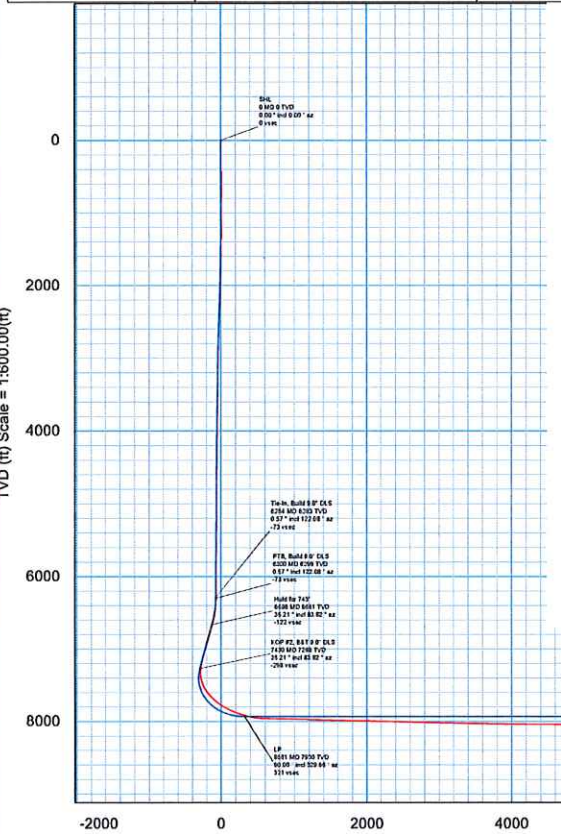
True North

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

Critical Point	MD	INCL	AZIM	TVD	VSEC	PL(V%)	EL(V%)	CLS
SHL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Final Survey	20224.00	89.78	329.24	8018.83	12031.34	10843.05	-5258.28	1.84
PTB	20257.00	89.78	329.28	8023.95	12042.35	10849.49	-5274.05	0.00

Seq	Survey Tool	Vendor/Tool	Wdg Size (in)	CLS Size (in)	Expected MD From (ft)	MD To (ft)	Survey Frequency (Hz)	EOU Size (ft/Min)	EOU Size (ft/Min)	Comments/Contingency
1	NAL_NSG-MD-HOT-Cryb Only		30	30	0	25	168.425	1.251	1.25	
2	NAL_NSG-MD-HOT-Cryb Only		30	30	25	25	Ad Str	1.251	1.25	
3	NAL_NSG-MD-HOT		30	30	25	25	Ad Str	11.833	3.452	
4	NAL_MVD_1_8_DEG		30	30	25	20257	Ad Str	426.711	34.87	

Surface Location										
Northing: 428773.73		Easting: 1801512.87		Latitude: N 39 40 12.73		Longitude: W 80 6 35.63		VSec Azimuth: 329.44		
Target Description	Shape	Dimension	Latitude	Longitude	Northing	Easting	TVD	VSec	PL(V%)	EL(V%)
Bogness SH LP	Point	N/A	N 39 40 20.22 W 80 6 37.19	427527.48	1802177.88	8074.00	329.81	718.15	800.04	
Bogness SH BHL	Point	N/A	N 39 42 0.38 W 80 6 43.09	437700.50	1796315.52	8074.00	12043.81	10892.86	-5271.71	



True North
True Grid
Mag

True North
Tot Corr (M->T -9.266°)
Mag Dec (-9.266°)
Grid Conv (-0.378°)

CONTROLLED	
Plan ref	Northeast Natural Bogness 5H
Drawing ref	Gyro+MVD G to 20257 MD
Copy number	01
Date	03-Jan-2019
Drawn by	Thomas
Checked by	Tom

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: 47-061-01802 County: Monongalia
District: Clay Well No: Bogges 5H
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: _____

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	8/7/2019
Job End Date:	8/28/2019
State:	West Virginia
County:	Monongalia
API Number:	47-061-01802-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Bogges 5H
Latitude:	39.67012200
Longitude:	-80.09344000
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8,035
Total Base Water Volume (gal):	17,867,842
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	87.24333	None
Sand (Proppant)	Producers Service Corp	Proppant	Silica Substrate	14808-60-7	100.00000	12.20022	None
7.5% HCL	Producers Service Corp	Acidizing	Hydrochloric Acid	7647-01-0	7.50000	0.03535	None
StimSTREAM FR 9800	Producers Service Corp	Friction Reducer	copolymer of 2-propenamide	Proprietary	30.00000	0.01640	None
			Petroleum Distillate	64742-47-8	20.00000	0.01093	None
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00109	None
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00109	None
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00055	None
BIOC11139A	Producers Service Corp	Biocide	Benzyl-(C12-C16 Alkyl)-Dimethyl-Ammonium Chloride	68424-85-1	30.00000	0.00681	None
			Glutaraldehyde	111-30-8	10.00000	0.00227	None

SCAL16486A	Producers Service Corp	Scale Inhibitor	Ethanol	64-17-5	5.00000	0.00114	None
			Amine Triphosphate	Proprietary	30.00000	0.00201	None
			Ethylene Glycol	107-21-1	30.00000	0.00201	None
			Sodium Phosphate	7632-05-5	30.00000	0.00201	None
4-N-1	Producers Service Corp	Inhibitor					
			Acetic acid	64-19-7	90.00000	0.00083	None
			2-Ethylhexanol	104-76-7	10.00000	0.00009	None
			Methanol	67-56-1	10.00000	0.00009	None
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00005	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	0.01093	
			Glutaraldehyde	111-30-8	10.00000	0.00227	
			Amine Triphosphate	Proprietary	30.00000	0.00201	
			Sodium Phosphate	7632-05-5	30.00000	0.00201	
			Ethanol	64-17-5	5.00000	0.00114	
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00109	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00109	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00055	
			2-Ethylhexanol	104-76-7	10.00000	0.00009	
			Methanol	67-56-1	10.00000	0.00009	
			Cocamide Diethanolamine	68603-42-9	5.00000	0.00005	
			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)

BJ Cementing Treatment Report

SERVICE SUPERVISOR	Harry Tarma	FORMATION	Marcellus Shale
CLIENT FIELD REPRESENTATIVE	JOSH	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	1,253.00	1,253.00	60.00		
Casing	13.38	12.62	54.50	1,211.00	1,211.00			

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Bottom Plug Provided By		Tool Depth (ft)	1,169.00
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)	2500.00
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)	1,169	Top Connection Size	13.375

Page 1

Client Name: Northeast Natural Energy, LLC
 Start Date: 2/3/2019

Well: BOGCESS NO 5H
 End Date: 2/3/2019

Well API: 47-061-01802
 Field Ticket #: FT-15382-CSX3Z00201-974909181



CIRCULATION PRIOR TO JOB

Well Circulated By	Rig	YP Mud In	
Circulation Prior to Job	No	YP Mud Out	
Circulation Time (min)	0.00	Solids Present at End of Circulation	No
Circulation Rate (bpm)	0.00	10 sec SGS	
Circulation Volume (bbls)	0.00	10 min SGS	
Lost Circulation Prior to Cement Job	Yes	30 min SGS	
Mud Density In (ppg)		Flare Prior to / during the Cement Job	No
Mud Density Out (ppg)		Gas Present	No
PV Mud In		Gas Units	
PV Mud Out			

TEMPERATURE

Ambient Temperature (°F)	45.00	Slurry Cement Temperature (°F)	65.00
Mix Water Temperature (°F)	60.00	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	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	EXTENDER, BENTONITE	20.0000	PPB
Spacer / Pre Flush / Flush	Gel Spacer	IntegraSeal POLI	1.0000	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	2.0000	BWOB
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)
2/3/2019 11:46:00 AM	Fresh Water	5.60	10.00	180.00	

Page 2

Client Name:	Northeast Natural Energy, LLC	Well:	BOGGESS NO 5H	Well API:	47-061-01802
Start Date:	2/3/2019	End Date:	2/3/2019	Field Ticket #:	FT-15382-C5X3200201-974909181



2/3/2019 12:16:00 PM	Gel Spacer	5.60	25.00	189.00
2/3/2019 12:20:00 PM	Fresh Water	5.60	10.00	192.00
2/3/2019 12:23:00 PM	Cement Slurry	5.60	259.70	348.00
2/3/2019 1:27:00 PM	Fresh Water	5.60	187.10	125.00

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	125.00	348.00	206.80
Rate (bpm)	5.60	5.60	5.60



DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	0.00
Calculated Displacement Vol (bbls)	180.70	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	181.00	Amt of Spacer to Surface	0.00
Did Float Hold?	Yes	Pressure Left on Casing (psi)	0.00
Bump Plug	Yes	Amt Bled Back After Job	1.00
Bump Plug Pressure (psi)	731.00	Total Volume Pumped (bbls)	757.00
Were Returns Planned at Surface	No	Top Out Cement Spotted	Yes
Cement Returns During Job	None	Lost Circulation During Cement Job	Yes

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

top out cement : density was a little to high when start pumping on the first 25 bbls@ 17ppg

JOB SUMMARY

Page 4

Client Name: Northeast Natural Energy, LLC
Start Date: 2/3/2019

Well: BOGGESS NO 5H
End Date: 2/3/2019

Well API: 47-061-01802
Field Ticket #: FT-15382-C5X3Z00201-974909181



BJ Cementing Treatment Report

SERVICE SUPERVISOR	Brian Hmidan	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 (lbs/ft)	MD (ft)	TVD (ft)	EXCESS (%)	GRADE	THREAD
Previous Casing	13.38	12.62	54.50	1,250.00	1,250.00			
Open Hole		12.25		2,550.00	2,550.00	40.00		
Casing	9.63	8.84	40.00	2,537.00	2,537.00		J-55	BTC

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Bottom Plug Provided By		Tool Depth (ft)	2,492.00
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)	3,950.00
Top Plug Size	9.625	Max Casing Pressure - Operated (psi)	3,160.00
Centralizers Used	Yes	Pipe Movement	None
Centralizers Quantity	20.00	Job Pumped Through	Manifold
Centralizers Type	Bow	Top Connection Thread	BTC
Landing Collar Depth (ft)	2,460	Top Connection Size	9.625

CIRCULATION PRIOR TO JOB

Well Circulated By	BJ	YP Mud In	0
Circulation Prior to Job	Yes	YP Mud Out	0
Circulation Time (min)	1.00	Solids Present at End of Circulation	No
Circulation Rate (bpm)	5.00	10 sec SGS	0.00
Circulation Volume (bbls)	195.00	10 min SGS	0.00
Lost Circulation Prior to Cement Job	No	30 min SGS	0.00
Mud Density In (ppg)	0.00	Flare Prior to / during the Cement Job	No
Mud Density Out (ppg)	0.00	Gas Present	No
PV Mud In	0	Gas Units	0
PV Mud Out	0		

TEMPERATURE

Ambient Temperature (°F)	45.00	Slurry Cement Temperature (°F)	65.00
Mix Water Temperature (°F)	45.00	Flow Line Temperature (°F)	0.00

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	1,019.0000	181.4000
Displacement Final	Fresh Water	8.3400				0.0000	189.0000

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	FOAM PREVENTER, FP-13L	0.7000	GALS/100SK
Tail Slurry	Cement Slurry	ACCELERATOR, SALT, CHLORIDE, CALCIUM, A-7P, PELLETS	1.5000	BWOB

TREATMENT SUMMARY

TIME	FLUID	RATE (bpm)	FLUID VOL. (bbls)	PIPE PRESSURE (psi)	ANNULUS PRESSURE (psi)	COMMENTS
	Gel Spacer	0.00	25.00			



Fresh Water	0.00	10.00		
Cement Slurry	0.00	181.40		
Fresh Water	0.00	189.00		

MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	0.00	1,000.00	500.00
Rate (bpm)	0.00	7.00	4.00



DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	20.00
Calculated Displacement Vol (bbls)	189.00	Method Used to Verify Returns	Visual
Actual Displacement Vol (bbls)	189.00	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	1.00
Bump Plug Pressure (psi)	1,500.00	Total Volume Pumped (bbls)	603.00
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

