

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

API 47 - 061 - 01812 County Monongalia District Clay
Quad Osage, WV Pad Name Boggess Field/Pool Name _____
Farm name Blake R. & H. Preston Boggess Well Number 17H
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 4391558.1 Easting 577787.8
Landing Point of Curve Northing 4392506.2 Easting 578333.9
Bottom Hole Northing 4394867.6 Easting 576924.5

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 3/7/19 Date drilling commenced 12/30/18 Date drilling ceased 7/2/19
Date completion activities began 9/20/19 Date completion activities ceased 10/11/19
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 - 01812 Farm name Blake R. & H. Preston Bogges Well number 17H

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	1,239'	N	54.5	NA	Y, 1 bbl
Coal							
Intermediate 1	12.25	9 5/8	2,538'	N	40	NA	Y, 30 bbl
Intermediate 2							
Intermediate 3							
Production	8.5	5.5	19,034'	N	20	NA	Y, 5.5 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	1.21	1,137	CTS	8+
Coal							
Intermediate 1	Class A	808	15.6	1.26	1,019	CTS	8+
Intermediate 2							
Intermediate 3							
Production	Class A	3,462	14.5	1.18	4,321	819	48
Tubing							

Drillers TD (ft) 19,065' Loggers TD (ft) 19,035'
 Deepest formation penetrated Oriskany (Pilot); Marcellus (Horizontal) Plug back to (ft) 5,236'
 Plug back procedure _____

Kick off depth (ft) 5,236'

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 _____

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 - 01812 Farm name Blake R. & H. Preston Boggess Well number 17H

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 - 01812 Farm name Blake R. & H. Preston Boggess Well number 17H

<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>		
Marcellus	8,036'	TVD	19,055' MD
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump

SHUT-IN PRESSURE Surface 2303 psi Bottom Hole 4286 psi DURATION OF TEST 24 hrs

OPEN FLOW Gas Oil NGL Water GAS MEASURED BY
25180 mcfpd _____ bpd _____ bpd _____ bpd _____ bpd Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
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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 Schlumberger
 Address 4600 Jbary 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

Boggess 17H Stimulation Information

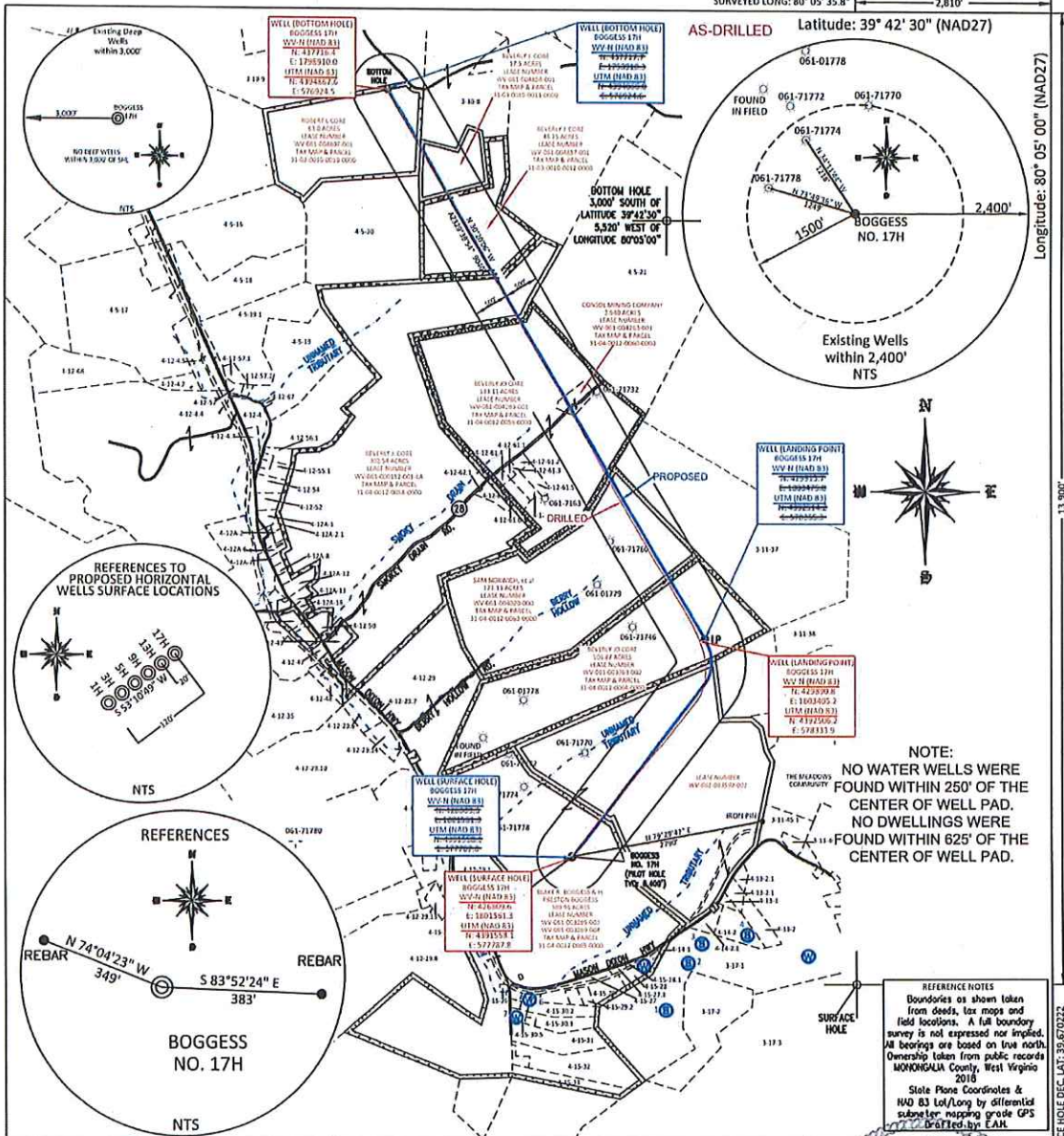
Stage Number	Report Date	ISIP (psi)	Breakdown Pressure (psi)	Avg Treating Pressure (psi)	Avg Treating Rate (BPM)	Pad Volume (bbls)	Total Clean Fluid (Bbls)	Total Proppant Amount (lbs)	Flush Volume (bbls)
1	9/20/2019	5,465	0	8,471	84	410	6,530	298,720	423
2	9/20/2019	6,597	5,518	8,723	82	225	10,358	500,080	418
3	9/24/2019	5,507	6,708	8,960	85	131	5,669	301,120	408
4	9/25/2019	5,555	8,400	8,490	80	150	10,254	502,500	400
5	9/25/2019	5,488	6,147	8,299	81	70	11,954	500,540	403
6	9/25/2019	5,721	6,309	8,417	82	69	10,165	498,560	395
7	9/26/2019	5,844	6,319	8,757	84	150	10,228	504,400	425
8	9/26/2019	5,881	6,097	8,764	84	80	10,125	498,800	388
9	9/27/2019	5,948	6,384	9,015	83	90	9,881	461,270	383
10	9/27/2019	5,806	6,233	8,854	84	100	9,734	497,580	381
11	9/27/2019	5,576	6,335	8,645	83	70	9,915	500,680	378
12	9/28/2019	5,809	5,960	8,935	83	47	10,514	500,020	371
13	9/28/2019	5,957	6,953	8,570	81	60	10,558	499,640	367
14	9/28/2019	5,768	6,148	8,671	83	95	10,294	501,530	362
15	9/29/2019	5,527	6,550	8,714	83	90	10,119	500,320	357
16	9/29/2019	9,200	6,446	8,645	83	60	10,741	499,920	165
17	9/29/2019	5,645	6,004	8,599	83	65	10,271	499,520	347
18	9/30/2018	5,852	6,218	8,244	80	110	9,646	499,000	347
19	9/30/2019	5,633	5,582	8,521	83	75	9,797	497,720	338
20	10/1/2019	5,914	6,058	8,529	84	60	10,458	499,040	338
21	10/1/2019	6,514	5,751	8,261	82	130	10,173	499,300	336
22	10/1/2019	5,797	5,953	7,977	80	80	9,991	503,600	335
23	10/2/2019	5,915	5,872	8,060	83	88	9,865	502,060	326
24	10/2/2019	5,767	5,956	8,430	85	42	10,128	508,160	320
25	10/3/2019	5,600	5,893	8,383	87	50	9,556	499,980	312
26	10/3/2019	6,201	5,950	8,173	83	50	8,820	500,740	308
27	10/3/2019	5,930	6,166	8,311	84	48	8,611	500,880	304
28	10/4/2019	6,093	6,350	8,323	84	80	8,515	502,620	301
29	10/4/2019	6,089	6,228	8,375	84	75	9,257	500,380	298
30	10/4/2019	6,000	6,226	8,414	86	40	8,680	500,100	292
31	10/5/2019	5,886	6,381	8,452	86	50	8,078	500,080	291
32	10/5/2019	6,285	6,277	8,444	83	41	7,854	449,480	348
33	10/6/2019	6,112	6,262	8,125	85	50	9,218	500,100	282
34	10/6/2019	6,155	6,482	8,220	84	50	8,516	500,660	275
35	10/7/2019	6,027	6,232	8,060	84	50	8,659	499,260	271
36	10/7/2019	5,927	6,510	8,346	84	65	9,405	502,560	267
37	10/8/2019	6,193	7,725	8,416	84	77	10,114	499,940	268
38	10/8/2019	6,207	6,462	8,163	82	52	9,371	500,860	258
39	10/8/2019	6,402	6,244	8,383	85	42	9,039	500,100	257
40	10/9/2019	6,466	6,405	8,227	82	75	9,334	500,600	248
41	10/9/2019	5,604	6,330	8,316	80	70	9,461	498,820	252
42	10/10/2019	6,123	6,232	8,230	84	60	9,159	503,140	245
43	10/10/2019	6,387	6,152	8,051	80	80	10,437	500,080	239
44	10/10/2019	5,800	5,490	8,264	84	45	9,134	499,340	230
45	10/11/2019	5,778	6,403	8,198	83	38	9,063	500,340	227

Bogges 17H Perforation Information

Stage Number	Report Date	Cluster 5 Bottom TD	Cluster 1 Top TD	Total Shots
1	9/20/19	18,890	0	0
2	9/20/19	18,690	18,847	40
3	9/24/19	18,205	18,323	40
4	9/25/19	18,014	18,165	40
5	9/25/19	17,822	17,973	40
6	9/25/19	17,631	17,782	40
7	9/26/19	17,439	17,590	40
8	9/26/19	17,248	17,399	40
9	9/27/19	17,056	17,207	40
10	9/27/19	16,865	17,016	40
11	9/27/19	16,673	16,824	40
12	9/28/19	16,482	16,633	40
13	9/28/19	16,290	16,441	40
14	9/28/19	16,099	16,250	40
15	9/29/19	15,907	16,059	40
16	9/29/19	15,716	15,867	40
17	9/29/19	15,524	15,676	40
18	9/30/18	15,333	15,484	40
19	9/30/19	15,141	15,293	40
20	10/1/19	14,950	15,101	40
21	10/1/19	14,759	14,910	40
22	10/1/19	14,567	14,718	40
23	10/2/19	14,376	14,527	40
24	10/2/19	14,184	14,335	40
25	10/3/19	13,993	14,144	40
26	10/3/19	13,801	13,952	40
27	10/3/19	13,610	13,761	40
28	10/4/19	13,418	13,569	40
29	10/4/19	13,227	13,378	40
30	10/4/19	13,035	13,186	40
31	10/5/19	12,844	12,995	40
32	10/5/19	12,652	12,804	40
33	10/6/19	12,461	12,612	40
34	10/6/19	12,269	12,421	40
35	10/7/19	12,078	12,229	40
36	10/7/19	11,886	12,038	40
37	10/8/19	11,695	11,846	40
38	10/8/19	11,504	11,655	40
39	10/8/19	11,312	11,463	40
40	10/9/19	11,121	11,272	40
41	10/9/19	10,929	11,080	40
42	10/10/19	10,738	10,889	40
43	10/10/19	10,546	10,697	40
44	10/10/19	10,355	10,506	40
45	10/11/19	10,163	10,314	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



NOTE:
NO WATER WELLS WERE FOUND WITHIN 250' OF THE CENTER OF WELL PAD.
NO DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF WELL PAD.

REFERENCE NOTES
Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records MONONGALIA County, West Virginia 2018
State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS
Dated by E.A.H.

FILE #: NEE14
DRAWING #: 2867
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

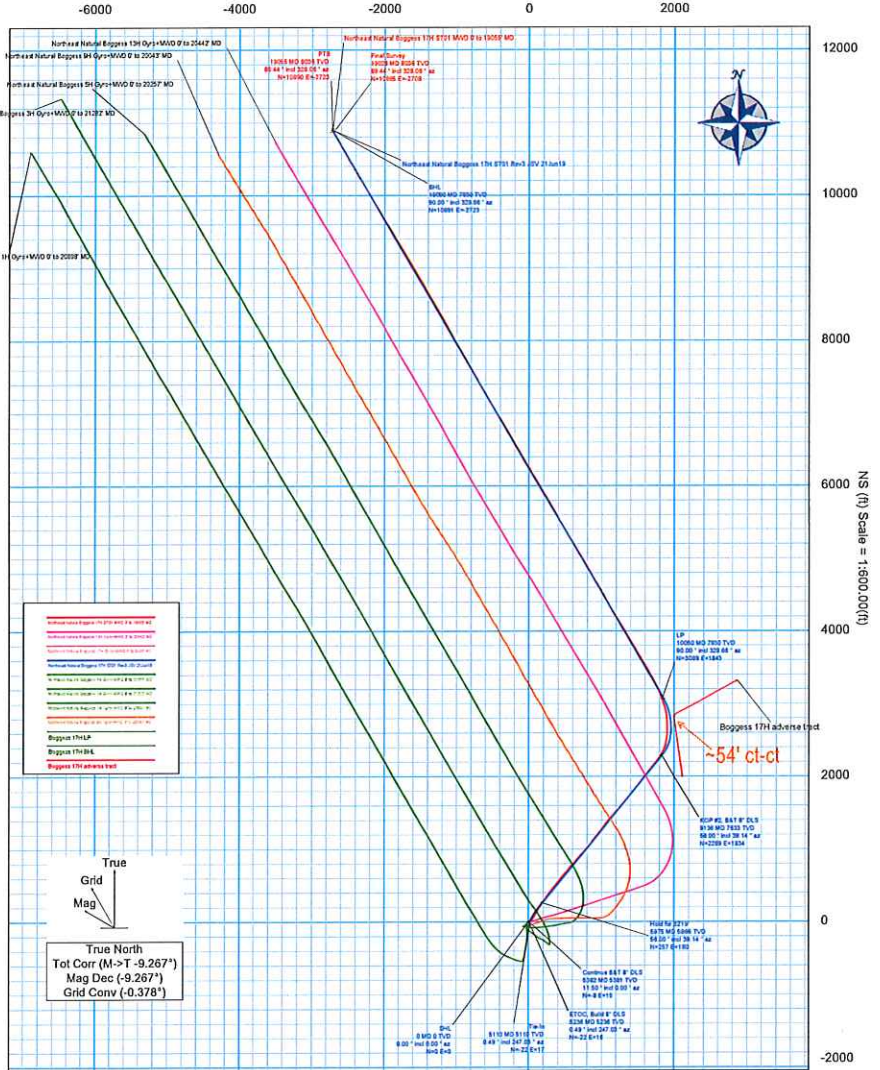


(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WYDEP
OFFICE OF OIL & GAS
601 57TH STREET
CHARLESTON, WV 25304
Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow
WATERSHED: DUNKARD CREEK
COUNTY/DISTRICT: MONONGALIA / CLAY
SURFACE OWNER: BLAKE R. & PRESTON H. BOGCESS
OIL & GAS ROYALTY OWNER: BLAKE R. & PRESTON H. BOGCESS 'et al'
LEASE NUMBERS: _____
DATE: JANUARY 13, 2020
OPERATOR'S WELL #: BOGCESS NO. 17H
API WELL #: 47 61 47-061-01812
STATE COUNTY PERMIT
AS-BUILT
ELEVATION: 1,266.2'
QUADRANGLE: OSAGE, WV
ACREAGE: 389.96 +/-
ACREAGE: 11183.8 +/-
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: TWD: 8,036' TMD: 19,055' (PILOT HOLE TWD: 8,400')
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

Borehole:	ST01	Well:	Bogges 17H	Field:	WV Monongalia County (NAD 83)	Structure:	Patterson 334
Gravity & Magnetic Parameters		Surface Location		Miscellaneous			
Model:	HDGM 2019	Dip:	66.645°	Date:	18-Jun-2019	Surface Location	NAD83 West Virginia State Plane, Northern Zone, US Feet
MagDec:	-9.267°	FS:	62103.164nT	Gravity FS:	999.334mgal (9.80665 Based)	Lat:	N 39 40 13.09
						Northing:	426809.6NUS
						Easting:	1801561.3NUS
						Grid Conv:	-0.3782°
						Scale Fact:	0.99994104
						Plan:	Northeast Natural Bogges 17H ST01 MVD 0° to 19055° MD

True North

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



- Northeast Natural Bogges 17H ST01 MVD 0° to 19055° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 20047° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 22057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 23057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 25057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 26447° MD
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- Northeast Natural Bogges 17H ST01 MVD 0° to 120057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 121057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 122057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 123057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 124057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 125057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 126057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 127057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 128057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 129057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 130057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 131057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 132057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 133057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 134057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 135057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 136057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 137057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 138057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 139057° MD
- Northeast Natural Bogges 17H ST01 MVD 0° to 140057° MD

True
Grid
Mag

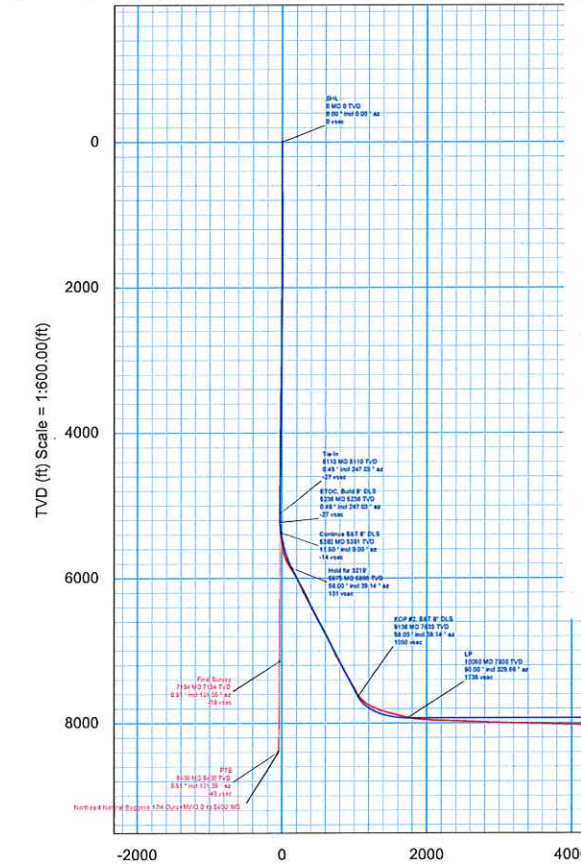
True North
Tot Corr (M->T -9.267°)
Mag Dec (-9.267°)
Grid Conv (-0.378°)

Critical Points								
Critical Point	ID	INCL	AZIM	TVD	VSEC	WYSEC	E(YM)	CLS
Tch	5110.00	0.49	247.03	5109.83	-27.28	-31.83	18.75	
Final Survey	12028.00	0.44	238.06	8235.53	13745.04	10088.15	-2729.06	1.05
PTB	12028.00	0.44	238.06	8235.52	13774.00	10129.76	-2723.24	0.00

PA#	Est.	Survey Test	Vendor/Tool	Ho/Se Size (in)	CRING Size (in)	Expend. Method (in)	MD From (ft)	MD To (ft)	Survey Frequency (Hz)	EOU Size (ft)	EOU Size (ft)	EOU Size (ft)	Comment/Contingency
1	1	NAL_N50-WHOT-Depth Only		33	33	0	25	150	425	1.251	1.25		
1	2	NAL_N50-WHOT-Depth Only		33	33	25	25	150	425	1.251	1.25		
1	3	NAL_N55-M3HOT		33	33	25	5110	Adj Str	9.543	3.42			
1	4	NAL_M4D_3_0_0_0		33	33	0	5110	19055	Adj Str	353.078	111.514		

Surface Location							
Northing	Easting	Latitude	Longitude	Veg	Altitude	Zone	UTM
426809.6	1801561.3	N 39 40 13.09	W 80 5 25.02		229.66		

Target Description	Shape	Dimension	Latitude	Longitude	Northing	Easting	TVD	VSec	WYSec	E(YM)	CLS
Bogges 17H adverse road	Point	N/A	N 39 43 13.09	W 80 5 25.02	426809.63	1801561.33	1293.00	0.00	0.00	0.00	
Bogges 17H LP	Point	N/A	N 39 43 43.82	W 80 5 11.44	426828.35	1803241.84	8074.00	1734.88	3283.17	1843.33	
Bogges 17H BIL	Point	N/A	N 39 42 07.72	W 80 6 0.55	437717.75	1710519.34	8074.00	10774.98	10281.07	-2723.08	



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

CONTROLLED	
Project	Northeast Natural Bogges 17H ST01 MVD 0° to 19055° MD
Drawing ref	
Copy number	of 3
Date	04-Dec-2019
Drawn By	Automa
City Number	12

BJ Cementing Treatment Report

SERVICE SUPERVISOR	Paul Christ	FORMATION	Marcellus Shale
CLIENT FIELD REPRESENTATIVE	Josh Grim	RIG	Highlands 8
DISTRICT	Bridgeport, WV	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	1,250.00	1,250.00			
Open Hole		12.25		2,550.00	2,550.00	40.00		
Casing	9.63	8.84	40.00	2,538.00	2,500.00			

HARDWARE

Bottom Plug Used?	No	Tool Type	Float Collar
Bottom Plug Provided By		Tool Depth (ft)	2,493.00
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	9,625	Max Casing Pressure - Operated (psi)	
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	
Circulation Prior to Job	No	YP Mud Out	
Circulation Time (min)		Solids Present at End of Circulation	No
Circulation Rate (bpm)	7.00	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	No
Mud Density Out (ppg)		Gas Present	No
PV Mud In		Gas Units	
PV Mud Out			

TEMPERATURE

Ambient Temperature (°F)	52.00	Slurry Cement Temperature (°F)	64.00
Mix Water Temperature (°F)	58.00	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	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	1.5000	BWOB
Tail Slurry	Cement Slurry	CEMENT, CLASS A	100.0000	PCT
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)
1/6/2019 10:37:00 AM	Gel Spacer	4.00	25.00	80.00	
1/6/2019 10:00:00 AM	Fresh Water	7.00	200.00	190.00	
1/6/2019 10:45:00 AM	Cement Slurry	5.00	181.00	200.00	
1/6/2019 11:39:00 AM	Fresh Water	7.70	189.00	1000.00	

Page 2

Client Name: Northeast Natural Energy, LLC
Start Date: 1/6/2019

Well: BOGGESS 17H
End Date: 1/6/2019

Well API: 47-061-01812
Field Ticket #:



MIN / MAX / AVG PRESSURE AND RATES

	MIN	MAX	AVG
Pressure (psi)	80.00	1000.00	367.50
Rate (bpm)	4.00	7.70	5.93



DISPLACEMENT AND END OF JOB SUMMARY

Displaced By	BJ	Amt of Cement Returned / Reversed	30.00
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)	1500.00	Total Volume Pumped (bbls)	604.00
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



Customer: NORTHEAST NATURAL ENERGY LLC		Date: 4/17/2019		Serv. Supervisor: Donald Brown	
Cust. Rep: Nathan Caldwell		Ticket #: JWV1504-0017		Serv. Center: Jane Lew - 3044	
Lease: Doggess 17H (Pilot Hole Kick Plug)		API Well #: 47-061-01812		County: Monongalia State: WV	
Well Type:		Rig: Patterson 334		Type of Job: Kickoff Plug	
Materials Furnished by C&J ENERGY SERVICES					
Plugs		Cooling Herbware		Physical Slurry Properties	
		Sacks of Cement	Fluid Den. (lb/gal)	Yield (cu/bu)	Mix Water (gal/bu)
11.5 ppg Spacer ahead Plug 1	+7.0 PPG C0157011		11.5		25.00
17.5 ppg Plug 1	100% C0916 +0.15% C12150+0.1% C0115+0.2% C01137011 +3.5% W07W C1111	455	17.5	0.05	3.41 / 76.00 / 37
11.5 ppg Spacer behind Plug 1	+7.0 PPG C0157011		11.5		0.00
Fresh Water Displacement			0.34		117.00
Displacement Chemicals:					
OPEN HOLE DATA		TUBULAR DATA			
8.75 in. O.H. 0 to 7,341 ft 8.5 in. O.H. (7,341 to 8,600 ft)		5 in. ID (0 to 8,370 ft)		SIZE WEIGHT	THREAD
				DEPTH (ft)	GRADE
				ID (in)	BURST (psi)
				COLLAPSE (psi)	
PREVIOUS CASING DATA		PERFORATED INTERVAL DATA		CASING EQUIPMENT DEPTHS	
		TOP		SIZE	STAGE
		BTM		FLOW	STAGE
		SPF		DEPTH	LOG
		SIZE		STAGE	LOG
WELL FLUID		DISPLACEMENT FLUID		STAGE DETAILS	
TYPE	DENSITY	VOLUME	TYPE	DENSITY	DATE
Fresh			Fresh	8.3 ppg	
Rate	Cap Press. (psi)	Top Press. (psi)	Ann Press. (psi)	Slg. Wt. (lb/gal)	Curt. Wt. (lb/gal)
5:45 AM					
5:05 AM					arrive on location
7:00 AM					go over job with company rep
8:00 AM					decide not to pump spacer
10:12 AM					spool trucking in
10:55 AM					waiting for water truck to finish unloading
11:18 AM					ready mixing
11:12 AM	7	1000		950	900 load hole with fresh water reculate brine out
1:45 PM				77	900 shut down
2:29 PM	5	400		977	900 pump cement @ 17.5 ppg mixed with acid
2:45 PM	4.75	130		1100	1000 displace
3:11 PM		0			1087 shut down open valve well on vacuum
3:12 PM					1087 rig put stands 00 feet to 7317
3:52 PM	4.5	400		81	1100 pump cement @ 17.5 ppg
4:50 PM	7	300		80	1250 displace fresh water
4:24 PM		0			1250 shut down vacuum on well
4:25 PM					1250 pull stands 60 feet to 6234
5:04 PM	5.5	400		80	1347 pump cement @ 17.5 ppg mixed with acid
5:25 PM	7	300		70	1417 displace with fresh water
5:33 PM		0			1417 shut down vacuum on well
5:34 PM					1417 pull stands 00 feet to 3027 and rig circulate bottoms up
5:35 PM					1417 wash truck then transfer remaining fresh water to day tank for rig
					1417
Left Yard	4/17/19 4:00 AM	Left Loc.	4/17/19 8:00 PM	Start Pump	4/17/19 11:21 AM
Arrived Loc.	4/17/19 5:30 AM	Returned Y/L	4/17/19 10:00 PM	End Pump	4/17/19 5:30 PM
Dropped Plug Loss	Well Differential (psi)	Float Head (psi)	POU Loss on Casing	Checked by Surface (SAS)	Top of Cement (ft)
			0	0	4037
				Yes	Yes
				1000	
Donald Brown					
Service Supervisor					

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/20/2019
Job End Date:	10/11/2019
State:	West Virginia
County:	Monongalia
API Number:	47-061-01812-00-00
Operator Name:	Northeast Natural Energy LLC
Well Name and Number:	Bogges 17H
Latitude:	39.67022200
Longitude:	-80.09326900
Datum:	NAD27
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	8,020
Total Base Water Volume (gal):	17,449,996
Total Base Non Water Volume:	0



Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Service Abstract 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	86.52185	None
Sand (Proppant)	Producers Service Corp	Proppant					
			Silica Substrate	14808-60-7	100.00000	13.12279	None
StimSTREAM FR 9800P	Producers Service Corp	Friction Reducer					
			copolymer of 2-propenamide	Proprietary	30.00000	0.01583	None
			Petroleum Distillate	64742-47-8	20.00000	0.01055	None
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00106	None
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00106	None
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00053	None
7.5% HCL	Producers Service Corp	Acidizing					
			Hydrochloric Acid	7647-01-0	7.50000	0.02050	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	0.00113	None
			Ethylene Glycol	107-21-1	30.00000	0.00182	None
			Sodium Phosphate	7632-05-5	30.00000	0.00182	None
			Amine Triphosphate	Proprietary	30.00000	0.00182	None
4-N-1	Producers Service Corp	Inhibitor					
			Acetic acid	64-19-7	90.00000	0.00048	None
			Methanol	67-56-1	10.00000	0.00005	None
			2-Ethylhexanol	104-76-7	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	0.01055	
			Glutaraldehyde	111-30-8	10.00000	0.00227	
			Amine Triphosphate	Proprietary	30.00000	0.00182	
			Sodium Phosphate	7632-05-5	30.00000	0.00182	
			Ethanol	64-17-5	5.00000	0.00113	
			Alcohols, C12-16, ethoxylated	68551-12-2	2.00000	0.00106	
			Oleic Acid Diethanolamide	93-83-4	2.00000	0.00106	
			Ammonium chloride ((NH4)Cl)	12125-02-9	1.00000	0.00053	
			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: 47-061-01812 County: Monongalia
District: Clay Well No: Bogges 17H
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: _____