



Antero Resources  
1615 Wynkoop Street  
Denver, CO 80202  
Office 303.357.7310  
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April 30, 2020

West Virginia Department of Environmental Protection  
Office of Oil and Gas  
601 57<sup>th</sup> Street  
Charleston, WV 25304

To Whom It May Concern:

Please find enclosed the Well Operator's Report of Well Work, Form WR-35 (including As-Drilled Survey Plat, Directional Survey and FracFocus report), Discharge Monitoring Report Form WR-34 and corresponding logs for the following wells off of the **Oxford 97 Pad**:

- Oxford 97 AHS
- Oxford 97 BHS
- Oxford 97 CHS
- Oxford 97 DHS
- Oxford 97 EHS
- Oxford 97 FHS
- Oxford 97 GHS
- Oxford 97 HHS

If you have any questions, please feel free to contact me at (303)-357-7223.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Griffith", with a long horizontal flourish extending to the right.

Megan Griffith  
Permitting Agent  
Antero Resources Corporation

Enclosures

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

API 47-017-06583 County Doddridge District West Union  
Quad Oxford 7.5' Pad Name Oxford 97 Pad Field/Pool Name -----  
Farm name Haessly Land & Timber LLC Well Number Oxford 97 EHS  
Operator (as registered with the OOG) Antero Resources Corporation  
Address 1615 Wynkoop Street City Denver State CO Zip 80202

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 4342664m Easting 516947m  
Landing Point of Curve Northing 4343898.98m Easting 516958.66m  
Bottom Hole Northing 4344712m Easting 516583m

Elevation (ft) 1333' 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)  
Air - Foam & 4% KCL  
Mud - Polymer

Date permit issued 3/15/2019 Date drilling commenced 3/26/2019 Date drilling ceased 6/10/2019  
Date completion activities began 10/5/2019 Date completion activities ceased 11/19/2019  
Verbal plugging (Y/N) N/A Date permission granted N/A Granted by N/A

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

Freshwater depth(s) ft 108', 505' Open mine(s) (Y/N) depths No  
Salt water depth(s) ft 1378', 1544' Void(s) encountered (Y/N) depths No  
Coal depth(s) ft None Identified Cavern(s) encountered (Y/N) depths No  
Is coal being mined in area (Y/N) No

Reviewed by:  
\_\_\_\_\_

API 47-017 - 06583 Farm name Haessly Land & Timber LLC Well number Oxford 97 EHS

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	24"	20"	59'	New	94#, H-40	N/A	Y
Surface	17-1/2"	13-3/8"	916'	New	48#, H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	3019'	New	36#, J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4"/8-1/2"	5-1/2"	12724'	New	23#, P-110	N/A	Y
Tubing		2-3/8"	7508'		4.7#, N-80		
Packer type and depth set		N/A					

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	214 sx	15.6	1.18	120	0'	8 Hrs.
Surface	Class A	631 sx	15.6	1.18	826	0'	8 Hrs.
Coal							
Intermediate 1	Class A	890 sx	15.6	1.18	1181	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	675sx (Lead) 2448sx (Tail)	14.5 (Lead), 15.2 (Tail)	1.40 (Lead), 1.26 (Tail)		~500' Into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 12724' MD, 6847' TVD (BHL), 6848' (Deepest Point Drilled) Loggers TD (ft) 12724' MD  
 Deepest formation penetrated Marcellus Plug back to (ft) N/A  
 Plug back procedure N/A

Kick off depth (ft) 6600'

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 \_\_\_\_\_

Conductor - 0

Surface - 1 above guide shoe, 1 above insert float, 1 every 4th joint to surface

Intermediate - 1 above float joint, 1 above float collar, 1 every 4th joint to surface

Production - 1 above float joint, 1 below float collar, 1 every 3rd joint to top of cement

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 N/A





**API 47-017-06583 Farm Name Haessly Land & Timber LLC Well Number Oxford 97 EHS**

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	11/17/2019	12566	12401.8	60	Marcellus
2	11/17/2019	12366.56	12202.36	60	Marcellus
3	11/18/2019	12167.12	12002.92	60	Marcellus
4	11/18/2019	11967.68	11803.48	60	Marcellus
5	11/18/2019	11768.24	11604.04	60	Marcellus
6	11/19/2019	11568.8	11404.6	60	Marcellus
7	11/19/2019	11369.36	11205.16	60	Marcellus
8	11/20/2019	11169.92	11005.72	60	Marcellus
9	11/20/2019	10970.48	10806.28	60	Marcellus
10	11/20/2019	10771.04	10606.84	60	Marcellus
11	11/21/2019	10571.6	10407.4	60	Marcellus
12	11/21/2019	10372.16	10207.96	60	Marcellus
13	11/21/2019	10172.72	10008.52	60	Marcellus
14	11/22/2019	9973.28	9809.08	60	Marcellus
15	11/22/2019	9773.84	9609.64	60	Marcellus
16	11/23/2019	9574.4	9410.2	60	Marcellus
17	11/23/2019	9374.96	9210.76	60	Marcellus
18	11/24/2019	9175.52	9011.32	60	Marcellus
19	11/24/2019	8976.08	8811.88	60	Marcellus
20	11/25/2019	8776.64	8612.44	60	Marcellus
21	11/25/2019	8577.2	8413	60	Marcellus
22	11/25/2019	8377.76	8213.56	60	Marcellus
23	11/25/2019	8178.32	8014.12	60	Marcellus
24	11/25/2019	7978.88	7814.68	60	Marcellus
25	11/26/2019	7779.44	7615.24	60	Marcellus

**EXHIBIT 2**

Stage No.	Stimulations Date	Avg Pump Rate	Avg Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbbls)	Amount of Nitrogen/ other (units)
1	11/17/2019	80.78901	7723.343	5567	3989	399250	7000.96	N/A
2	11/17/2019	83.50125	7840.086	5387	4434	398950	6857.34	N/A
3	11/18/2019	83.32776	7814.258	5686	3775	398900	6918.09	N/A
4	11/18/2019	84.60103	7731.159	5220	3642	399100	6982.58	N/A
5	11/18/2019	85.09209	7818.898	5318	3402	398800	6898.13	N/A
6	11/19/2019	84.15911	7491.145	5007	3277	398700	6940.74	N/A
7	11/19/2019	84.55441	7725.339	5380	3416	398950	6815.25	N/A
8	11/20/2019	79.17333	7400.56	5565	3620	399100	6840.89	N/A
9	11/20/2019	79.9523	7380.142	5520	3240	399050	6850.68	N/A
10	11/20/2019	77.98011	7343.214	5330	3922	398700	6886.24	N/A
11	11/21/2019	79.29116	7399.05	5449	4436	400150	6947.3	N/A
12	11/21/2019	81.20491	7384.821	5518	4251	400000	6825.35	N/A
13	11/21/2019	84.77783	7627.802	5179	4516	399600	6768.33	N/A
14	11/22/2019	81.16235	7201.606	5578	4716	399600	6733.43	N/A
15	11/22/2019	81.90458	7344.7	5880	4084	399550	6815.43	N/A
16	11/23/2019	81.77975	7158.578	5444	4725	399600	6771.34	N/A
17	11/23/2019	86.36051	7352.282	5459	3473	399200	6747.63	N/A
18	11/24/2019	86.0894	7181.352	5873	3816	399350	6728.46	N/A
19	11/24/2019	82.06706	6891.531	5807	4070	399050	6755.86	N/A
20	11/25/2019	82.83738	7353.445	5854	3470	399200	6791.43	N/A
21	11/25/2019	83.01779	7514.652	5997	3529	399000	6770.08	N/A
22	11/25/2019	82.34385	7359.845	6511	3721	399200	6756.84	N/A
23	11/25/2019	84.07068	7378.557	6363	3662	400600	6699.525	N/A
24	11/25/2019	83.52171	7896.128	6551	4156	399470	6785.01	N/A
25	11/26/2019	82.4742	7769.398	6290	3812	395590	6875.58	N/A
	<b>AVG</b>	<b>82.6</b>	<b>7,483</b>	<b>5,669</b>	<b>3,886</b>	<b>9,978,660</b>	<b>170,762</b>	<b>TOTAL</b>

**EXHIBIT 3**

LITHOLOGY/ FORMATION	TOP DEPTH (TVD)	BOTTOM DEPTH (TVD)	TOP DEPTH (MD)	BOTTOM DEPTH (MD)
	From Surface	From Surface	From Surface	From Surface
Silty Sandstone	60	160	60	160
Sandstone	160	270	160	270
Silty sandstone tr coal	270	320	270	320
Shaly siltstone tr coal	320	530	320	530
Shaly siltstone	530	640	530	640
Silty Sandstone	640	790	640	790
Silty sandstone	790	860	790	860
Silty Sandstone	860	1,070	860	1,070
Siltstone	1,070	1,260	1,070	1,260
Siltstone tr coal	1,260	1,425	1,260	1,425
Sandstone tr coal	1,425	1,750	1,425	1,750
Shaly siltstone tr coal	1,750	1,790	1,750	1,790
Silty sandstone tr coal	1,790	1,969	1,790	N/A
Big Lime	1,969	2,682	1,969	2,682
Fifty Foot Sandstone	2,682	2,729	2,682	2,730
Gordon	2,729	3,019	2,730	3,019
Fifth Sandstone	3,019	3,092	3,019	3,092
Bayard	3,092	3,848	3,092	3,903
Speechley	3,848	4,089	3,903	4,181
Balltown	4,089	4,582	4,181	4,747
Bradford	4,582	5,021	4,747	5,260
Benson	5,021	5,285	5,260	5,564
Alexander	5,285	6,552	5,564	7,077
Sycamore	6,365	6,534	6,843	7,059
Middlesex	6,534	6,670	7,077	7,319
Burkett	6,670	6,701	7,337	7,395
Tully	6,701	6,751	7,413	7,575
Marcellus	6,751	NA	7,575	NA

\*Please note Antero determines formation tops based on mud logs that are only run on one well on a multi-well pad. The measured depth (MD) data on subsequent wells may be slightly different due to the well's unique departure.



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

Company Name: Antero Resources Corporation  
API No: 47-017-06583 County: Doddridge  
District: West Union Well No: OXFD97 EHS  
Farm Name: Haessly Land & Timber, LLC  
Discharge Date/s From: (MMDDYY) 12/27/19 To: (MMDDYY) 01/26/20  
Discharge Times. From: 0:00 To: 24:00  
Total Volume to be Disposed from this facility (gallons): 1,304,420  
Disposal Option(s) Utilized (write volumes in gallons):

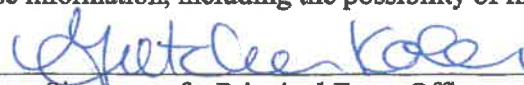
- (1) Land Application: \_\_\_\_\_ (Include a topographical map of the Area.)  
(2) UIC: 101,119 Permit No. 3400923821, 3400923823, 3400923824, 3416729731, 3410523652, 3410523619, 4708509721, 3416729543, 3416729464, 3416729445  
(3) Offsite Disposal: \_\_\_\_\_ Site Location: \_\_\_\_\_  
(4) Reuse: 1,203,301 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: n/a Cl- mg/l n/a DO mg/l
1. Do you have permission to use expedited treatment from the Director or his representative? (Y/N) n/a 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) n/a If yes, go to line 5. If not, go to line 3.
  3. Do you have a chloride value pretreatment (see above)? (Y/N) n/a If yes, go to line 4. If not, go to line 5.
  4. Is the Chloride level less than 5000 mg/l? (Y/N) n/a If yes, then enter a one (1) on line 7.
  5. Do you have a pretreatment value for DO? (See above) (Y/N) n/a 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) n/a If yes, enter a two (2) on line 7. If not, enter a three (3) on line 7.
  7. n/a is the category of your pit. Use the Appropriate section.
  8. Comments on Pit condition: n/a No Pit on site.

Name of Principal Exec. Officer: Gretchen Kohler  
Title of Officer: Senior Environmental and Regulatory Manager  
Date Completed: 3/16/20

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: \_\_\_\_\_



