WR-35
Rev. 8/23/13

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

RECEIVED
FEB 12 2016
WV GEOLOGICAL SURVEY
MORGANTOWN, WV

API 47 - 085 - 10103 County Ritchie District Union
Quad Pullman 7.5' Pad Name John Richards Pad Field/Pool Name ----
Farm name Richards, John Wayne Well Number Duckworth Unit 3H
Operator (as registered with the OOG) Antero Resources Corporation
Address 1615 Wynkoop St. 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 4339570m Easting 506946m
Landing Point of Curve Northing 4339303.71m Easting 506858.64
Bottom Hole Northing 4337649m Easting 507157m

Elevation (ft) 1025' 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 6/25/2014 Date drilling commenced 9/30/2014 Date drilling ceased 11/14/2014
Date completion activities began 9/3/2015 Date completion activities ceased 11/13/2015
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 42', 52', 172' Open mine(s) (Y/N) depths No
Salt water depth(s) ft None Identified 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:

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API 47- 085 - 10103 Farm name Richards, John Wayne Well number Duckworth Unit 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"	20"	40'	New	94# K-55	N/A	Y
Surface	17- 1/2"	13- 3/8"	408'	New	48# H-40	N/A	Y
Coal							
Intermediate 1	12-1/4"	9-5/8"	2535'	New	36# J-55	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8-3/4" & 8-1/2"	5-1/2"	12676'	New	20# J-55	N/A	Y
Tubing		2-3/8"	6566'		4.7# N-80	N/A	
Packer type and depth set		N/A					

Comment Details

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft^3/sks)	Volume (ft^3)	Cement Top (MD)	WOC (hrs)
Conductor	Class A	150 sx	15.6	1.18	38	0'	8 Hrs.
Surface	Class A	477 sx	15.6	1.18	283	0'	8 Hrs.
Coal							
Intermediate 1	Class A	983 sx	15.6	1.00	794	0'	8 Hrs.
Intermediate 2							
Intermediate 3							
Production	Class H	850 sx (Lead) 1100 sx (Tail)	14.5 Lead 15.2 Tail	1.30 Lead 1.86 Tail	2438	~500' into Intermediate Casing	8 Hrs.
Tubing							

Drillers TD (ft) 12676' MD, 6425 TVD (BHL) Loggers TD (ft) 12676'

Deepest formation penetrated Marcellus Plug back to (ft) N/A

Plug back procedure N/A

Kick off depth (ft) 5720'

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 aboce 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

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API 47- 085 - 10103 Farm name Richards, John Wayne Well number Duckworth Unit 3H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)

*PLEASE SEE ATTACHED EXHIBIT 1

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)

*PLEASE SEE ATTACHED EXHIBIT 2

Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS		
Marcellus	6365' (TOP)	TVD	6712' (TOP) MD

Please insert additional pages as applicable.

GAS TEST □ Build up □ Drawdown ■ Open Flow OIL TEST ■ Flow □ Pump

SHUT-IN PRESSURE Surface 3000 psi Bottom Hole --- psi DURATION OF TEST --- hrs

OPEN FLOW	Gas	Oil	NGL	Water	GAS MEASURED BY
	9217 mcfpd	59 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_2S, ETC)
	0		0		

*PLEASE SEE ATTACHED EXHIBIT 3

Please insert additional pages as applicable.

Drilling Contractor Frontier Drilling LLC
Address 562 Spring Run Rd. City Pennsboro State WV Zip 26415

Logging Company Rush Wellsite Services
Address 600 Alpha Drive City Canonsburg State PA Zip 15317

Cementing Company Nabors Completion & Production Services, Co.
Address 1650 Hackers Creek City Jane Lew State WV Zip 26378

Stimulating Company US Well Services
Address 533 Industrial Park Dr. City Jane Lew State WV Zip 26378
Please insert additional pages as applicable.

Completed by Kara Quackenbush Telephone 303-357-7233
Signature [signature] Title Permit Representative Date 1/26/2016

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

API 47-085-10103 Farm Name Richards, John Wayne Well Number Duckworth Unit 3H					
EXHIBIT 1					
Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	3-Sep-15	12,414	12,585	60	Marcellus
2	25-Sep-15	12,212	12,383	60	Marcellus
3	25-Sep-15	12,010	12,181	60	Marcellus
4	25-Sep-15	11,808	11,978	60	Marcellus
5	26-Sep-15	11,606	11,776	60	Marcellus
6	26-Sep-15	11,404	11,574	60	Marcellus
7	26-Sep-15	11,202	11,372	60	Marcellus
8	26-Sep-15	11,000	11,170	60	Marcellus
9	27-Sep-15	10,797	10,968	60	Marcellus
10	27-Sep-15	10,595	10,766	60	Marcellus
11	27-Sep-15	10,393	10,564	60	Marcellus
12	27-Sep-15	10,191	10,362	60	Marcellus
13	28-Sep-15	9,989	10,159	60	Marcellus
14	28-Sep-15	9,787	9,957	60	Marcellus
15	28-Sep-15	9,585	9,755	60	Marcellus
16	30-Sep-15	9,383	9,553	60	Marcellus
17	2-Oct-15	9,181	9,351	60	Marcellus
18	2-Oct-15	8,979	9,149	60	Marcellus
19	2-Oct-15	8,776	8,947	60	Marcellus
20	2-Oct-15	8,574	8,745	60	Marcellus
21	3-Oct-15	8,372	8,543	60	Marcellus
22	3-Oct-15	8,170	8,340	60	Marcellus
23	3-Oct-15	7,968	8,138	60	Marcellus
24	3-Oct-15	7,766	7,936	60	Marcellus
25	3-Oct-15	7,564	7,734	60	Marcellus
26	4-Oct-15	7,362	7,532	60	Marcellus
27	4-Oct-15	7,160	7,330	60	Marcellus
28	4-Oct-15	6,957	7,128	60	Marcellus
29	4-Oct-15	6,755	6,926	60	Marcellus

API 47-085-10103 **Farm Name** Richards, John Wayne **Well Number** Duckworth Unit 3H

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 (bbls)	Amount of Nitrogen/ other (units)
1	24-Sep-15	65.5	6,758	N/A	4,720	145,060	6,732	N/A
2	25-Sep-15	54.6	7,268	5,733	4,896	60,430	6,578	N/A
3	25-Sep-15	64.8	6,673	5,364	4,521	182,006	6,878	N/A
4	25-Sep-15	63.7	6,177	5,477	3,320	253,816	6,704	N/A
5	26-Sep-15	64.9	6,575	5,474	5,146	201,480	6,556	N/A
6	26-Sep-15	63.1	6,489	5,516	4,062	154,360	6,822	N/A
7	26-Sep-15	66.5	7,003	5,515	4,734	142,528	6,956	N/A
8	26-Sep-15	64.5	6,771	5,528	4,522	159,817	7,111	N/A
9	27-Sep-15	66.9	6,433	5,302	5,309	257,110	6,532	N/A
10	27-Sep-15	66.3	6,408	5,342	4,914	248,670	6,330	N/A
11	27-Sep-15	66.1	6,438	5,750	4,180	243,538	6,333	N/A
12	27-Sep-15	62.9	6,647	5,163	4,897	225,589	6,944	N/A
13	28-Sep-15	67.0	6,451	5,634	3,843	257,180	6,411	N/A
14	28-Sep-15	67.0	6,589	5,565	3,290	233,720	6,969	N/A
15	28-Sep-15	49.4	7,196	5,658	5,150	23,120	6,923	N/A
16	30-Sep-15	66.0	6,892	5,838	4,884	199,340	5,109	N/A
17	2-Oct-15	66.0	6,533	5,732	4,644	245,300	6,278	N/A
18	2-Oct-15	65.0	6,591	5,425	4,912	238,380	6,168	N/A
19	2-Oct-15	67.2	6,707	5,481	5,176	248,860	6,417	N/A
20	2-Oct-15	67.7	6,659	5,807	5,257	240,540	6,859	N/A
21	3-Oct-15	64.0	6,501	5,464	4,467	225,040	6,318	N/A
22	3-Oct-15	61.0	6,881	5,786	3,778	164,060	6,846	N/A
23	3-Oct-15	65.8	6,421	5,923	3,833	256,700	6,252	N/A
24	3-Oct-15	67.0	6,412	5,849	4,671	238,520	6,815	N/A
25	3-Oct-15	67.0	6,250	5,908	5,403	256,840	6,507	N/A
26	4-Oct-15	66.0	6,057	6,255	4,838	215,300	6,746	N/A
27	4-Oct-15	60.0	6,212	6,087	4,325	144,750	6,332	N/A
28	4-Oct-15	67.0	6,682	5,883	4,918	216,300	6,748	N/A
29	4-Oct-15	67.5	6,128	6,367	4,862	254,260	6,553	N/A
AVG=		**64.5**	**6,579**	**5,672**	**4,602**	**5,932,614**	**190,727**	TOTAL

API 47-085-10103 Farm Name Richards, John Wayne Well Number Duckworth Unit 3H				
EXHIBIT 3				
LITHOLOGY/ FORMATION	**TOP DEPTH (TVD) From Surface**	**BOTTOM DEPTH (TVD) From Surface**	**TOP DEPTH (MD) From Surface**	**BOTTOM DEPTH (MD) From Surface**
Fresh Water	42'	N/A	42'	N/A
Fresh Water	52'	N/A	52'	N/A
Fresh Water	172'	N/A	172'	N/A
Silt	0	37	0	37
Sandstone	est. 37	97	est. 37	97
Silty Shale	est. 97	417	est. 97	417
Silty Sandstone	est. 417	657	est. 417	657
Sandy siltstone	est. 657	737	est. 657	737
Limey Shale	est. 737	817	est. 737	817
Silty Shale	est. 817	1317	est. 817	1317
Sandstone	est. 1317	1357	est. 1317	1357
Sandy shale	est. 1357	1417	est. 1357	1417
Sandstone	est. 1417	1497	est. 1417	1497
Sandy shale	est. 1497	1577	est. 1497	1577
Shale / Coal	est. 1577	1637	est. 1577	1637
Sandstone (Tr Coal)	est. 1637	1817	est. 1637	1817
Shale	est. 1817	1897	est. 1817	1897
Limey Siltstone	est. 1897	1945	est. 1897	1968
Big Lime	1945	2032	1968	2032
Big Injun	2032	2286	2032	2286
Gantz Sand	2286	2449	2286	2449
Fifty Foot Sandstone	2449	2663	2449	2663
Gordon	2663	2947	2663	2947
Fifth Sandstone	2947	3051	2947	3051
Bayard	3051	3428	3051	3428
Warren	3428	3824	3428	3824
Speechley	3824	3952	3824	3952
Baltown	3952	4516	3952	4516
Bradford	4516	4880	4516	4880
Benson	4880	5120	4880	5121
Alexander	5120	5322	5121	5322
Elk	5322	5720	5322	5721
Rhinestreet	5720	6051	5721	6100
Sycamore	6051	6208	6100	6344
Middlesex	6208	6315	6344	6556
Burkett	6315	6344	6556	6637
Tully	6344	6365	6637	6712
Marcellus	6365	NA	6712	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.

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	9/24/2015
Job End Date:	10/4/2015
State:	West Virginia
County:	Ritchie
API Number:	47-085-10103-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Duckworth 3H
Longitude:	-80.91972200
Latitude:	39.20528600
Datum:	NAD83
Federal/Tribal Well:	NO
True Vertical Depth:	6,425
Total Base Water Volume (gal):	8,419,632
Total Base Non Water Volume:	0

FracFocus Chemical Disclosure Registry

GROUNDWATER PROTECTION COUNCIL

Oil & Gas

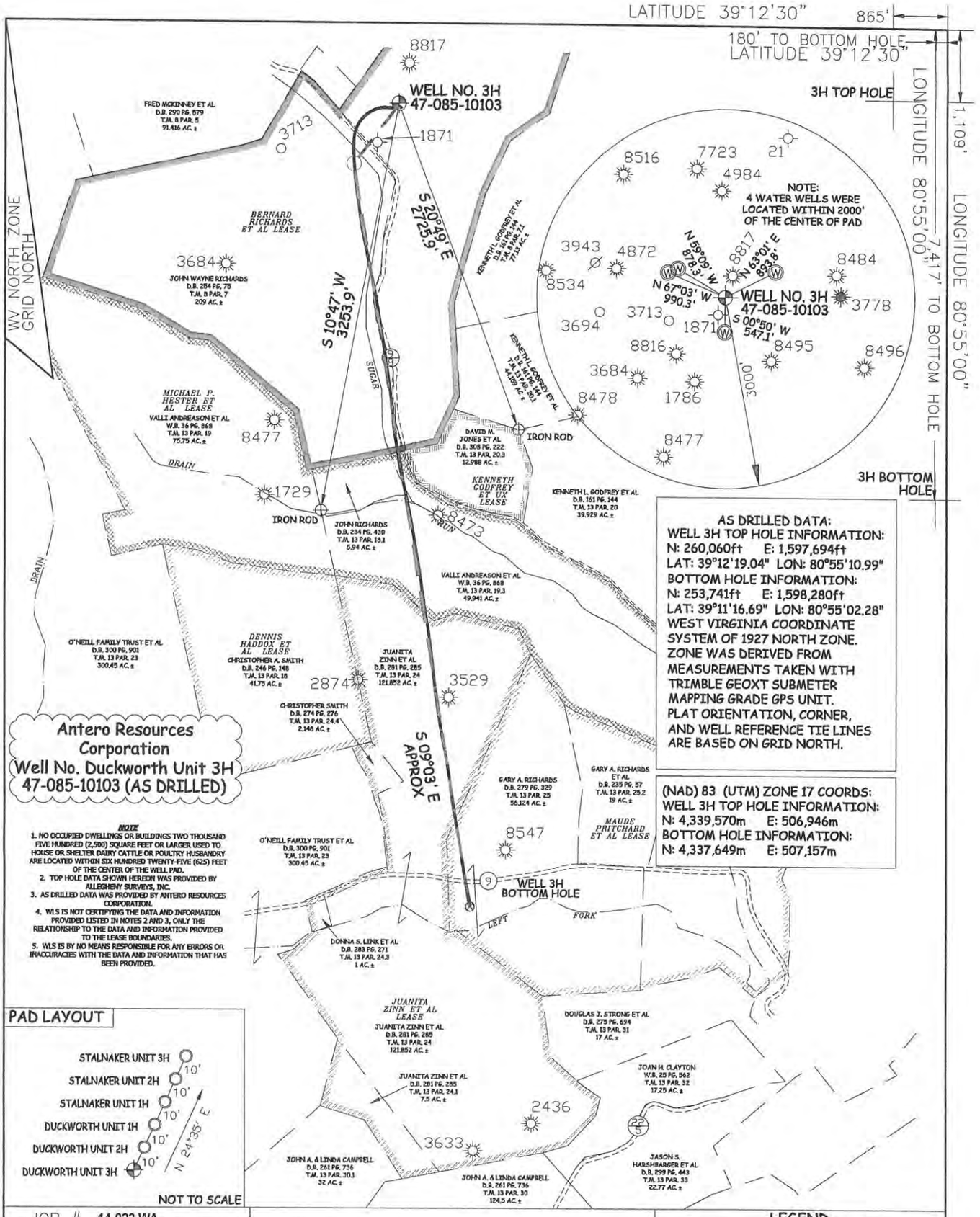
Hydraulic Fracturing Fluid Composition:

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	Antero Resources	Base Fluid					
			Water	7732-18-5	100.00000	91.72841	
Sand	U.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	7.74981	
HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.50000	0.17142	
			Hydrogen Chloride	7647-01-0	18.00000	0.04095	
LGC-15	U.S. Well Services	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.08374	
			Petroleum Distillates	64742-47-8	60.00000	0.07931	
			Suspending agent (solid)	14808-60-7	3.00000	0.01281	
			Surfactant	68439-51-0	3.00000	0.00502	
WFRA-405	U.S. Well Services	Friction Reducer					
			Water	7732-18-5	40.00000	0.03347	
			Anionic Polyacrylamide	Proprietary	40.00000	0.03347	
			Sodium Chloride	7647-14-5	20.00000	0.01673	
			Petroleum Distillates	64742-47-8	20.00000	0.01347	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00418	

SI-1100	U.S. Well Services	Scale Inhibitor					
			Water	7732-18-5	80.00000	0.01001	
			Ethylene Glycol	107-21-1	25.00000	0.00353	
			Copolymer of Maleic and Acrylic acid	52255-49-9	10.00000	0.00148	
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	7.50000	0.00127	
			Hexamethylene tramine penta (methylene phosphonic acid)	34690-00-1	5.00000	0.00081	
			Phosphino carboxylic acid polymer	71050-62-9	5.00000	0.00081	
			Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5	2.00000	0.00033	
K-BAC 1020	U.S. Well Services	Anti-Bacterial Agent					
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00403	
			Deionized Water	7732-18-5	28.00000	0.00230	
AP One	U.S. Well Services	Gel Breakers					
			Ammonium Persulfate	7727-54-0	100.00000	0.00230	
AI-301	U.S. Well Services	Acid Corrosion Inhibitors					
			Diethylene Glycol	111-46-6	30.00000	0.00013	
			Methenamine	100-97-0	20.00000	0.00010	
			Hydrogen Chloride	7647-01-0	10.00000	0.00005	
			Polyethylene polyamine	68603-67-8	10.00000	0.00004	
			Coco amine	61791-14-8	5.00000	0.00002	
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.							

* 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)



JOB # 14-023 WA
DRAWING # DUCKWORTH3HADR
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY SUBMETER
PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS

STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS

WILLOW LAND SURVEYING PLLC
220 MASONIC AVE. PENNSBORO
WEST VIRGINIA 26415

LEGEND
- Surface Owner Boundary Lines +/-
- Interior Surface Tracts +/-
- Existing Fence
- Found monument, as noted
- Proposed Well Path
- As Drilled Well Path

DATE 07/13/15
OPERATOR'S WELL# DUCKWORTH UNIT #3H
API WELL # 47 – 085 – 10103
STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
DEPARTMENT OF ENERGY
DIVISION OF OIL AND GAS
WELL TYPE: OIL ___ GAS X LIQUID INJECTION ___ WASTE DISPOSAL ___
(IF "GAS") PRODUCTION X STORAGE ___ DEEP ___ SHALLOW X
LOCATION: ELEVATION 1,035' ORIGINAL - 1,025' AS DRILLED WATERSHED SOUTH FORK HUGHES RIVER
QUADRANGLE PULLMAN 7.5' DISTRICT UNION COUNTY RITCHIE
SURFACE OWNER JOHN WAYNE RICHARDS ACREAGE 209 ACRES +/-
OIL & GAS ROYALTY OWNER BERNARD RICHARDS ET AL; LEASE ACREAGE 214 ACRES±;
MICHAEL P. HEASTER ET AL; JUANITA ZINN ET AL; MAUDE PRITCHARD ET AL 234.5 ACRES±; 132.5 ACRES±; 137 ACRES±
PROPOSED WORK: DRILL ___ CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR STIMULATE ___
PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___ OTHER PHYSICAL CHANGE IN WELL
(SPECIFY) (X) AS DRILLED PLUG & ABANDON CLEAN OUT & REPLUG
TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,425' TVD 12,676' MD

WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER
ADDRESS 1615 WYNKOOP STREET ADDRESS CT CORPORATION SYSTEM
DENVER, CO 80202 5400 D BIG TYLER ROAD
CHARLESTON, WV 25313

COUNTY NAME PERMIT

FORM WW-6