



Antero Resources  
1615 Wynkoop Street  
Denver, CO 80202  
Office 303.357.7310  
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August 9, 2019

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:

- Beem Unit 3H (API # 47-095-02474)—Pyle Run Pad
- Heintzman Unit 1H (API # 47-095-02526)—Pyle Run Pad
- Heintzman Unit 2H (API # 47-095-02527)—Pyle Run Pad
- Heintzman Unit 3H (API # 47-095-02528)—Pyle Run Pad
- Spock Unit 1H (API # 47-095-02478)—Pyle Run Pad
- Spock Unit 2H (API # 47-095-02427)—Pyle Run Pad
- Spock Unit 3H (API # 47-095-02428)—Pyle Run Pad

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 "MGriffith", written over a horizontal line.

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- \_\_\_\_\_ - \_\_\_\_\_ County \_\_\_\_\_ District \_\_\_\_\_  
Quad \_\_\_\_\_ Pad Name \_\_\_\_\_ Field/Pool Name \_\_\_\_\_  
Farm name \_\_\_\_\_ Well Number \_\_\_\_\_  
Operator (as registered with the OOG) \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing \_\_\_\_\_ Easting \_\_\_\_\_  
Landing Point of Curve Northing \_\_\_\_\_ Easting \_\_\_\_\_  
Bottom Hole Northing \_\_\_\_\_ Easting \_\_\_\_\_

Elevation (ft) \_\_\_\_\_ 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)  
\_\_\_\_\_  
\_\_\_\_\_

Date permit issued \_\_\_\_\_ Date drilling commenced \_\_\_\_\_ Date drilling ceased \_\_\_\_\_  
Date completion activities began \_\_\_\_\_ Date completion activities ceased \_\_\_\_\_  
Verbal plugging (Y/N) \_\_\_\_\_ Date permission granted \_\_\_\_\_ Granted by \_\_\_\_\_

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

Freshwater depth(s) ft \_\_\_\_\_ Open mine(s) (Y/N) depths \_\_\_\_\_  
Salt water depth(s) ft \_\_\_\_\_ Void(s) encountered (Y/N) depths \_\_\_\_\_  
Coal depth(s) ft \_\_\_\_\_ Cavern(s) encountered (Y/N) depths \_\_\_\_\_  
Is coal being mined in area (Y/N) \_\_\_\_\_

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

API 47- \_\_\_\_\_ - \_\_\_\_\_ Farm name \_\_\_\_\_ Well number \_\_\_\_\_

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							
Surface							
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production							
Tubing							
Packer type and depth set							

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							
Surface							
Coal							
Intermediate 1							
Intermediate 2							
Intermediate 3							
Production							
Tubing							

Drillers TD (ft) \_\_\_\_\_ Loggers TD (ft) \_\_\_\_\_  
 Deepest formation penetrated \_\_\_\_\_ Plug back to (ft) \_\_\_\_\_  
 Plug back procedure \_\_\_\_\_

Kick off depth (ft) \_\_\_\_\_

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- \_\_\_\_\_ - \_\_\_\_\_ Farm name \_\_\_\_\_ Well number \_\_\_\_\_

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
<b>*PLEASE SEE ATTACHED EXHIBIT 1</b>					

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)
<b>*PLEASE SEE ATTACHED EXHIBIT 2</b>								

Please insert additional pages as applicable.

API 47- \_\_\_\_\_ - \_\_\_\_\_ Farm name \_\_\_\_\_ Well number \_\_\_\_\_

PRODUCING FORMATION(S)

DEPTHS

_____	_____ TVD	_____ MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump

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

OPEN FLOW Gas \_\_\_\_\_ mcfpd Oil \_\_\_\_\_ bpd NGL \_\_\_\_\_ bpd Water \_\_\_\_\_ bpd

GAS MEASURED BY  Estimated  Orifice  Pilot

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

**\*PLEASE SEE ATTACHED EXHIBIT 3**


Please insert additional pages as applicable.

Drilling Contractor \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Logging Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Cementing Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Stimulating Company \_\_\_\_\_  
Address \_\_\_\_\_ City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Please insert additional pages as applicable.

Completed by \_\_\_\_\_ Telephone \_\_\_\_\_  
Signature \_\_\_\_\_ Title \_\_\_\_\_ Date \_\_\_\_\_

**EXHIBIT 1**

Stage No.	Perforation Date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formations
1	2/11/2019	16925		60	Marcellus
2	2/11/2019	16795.218	16628.308	60	Marcellus
3	2/12/2019	16592.526	16425.616	60	Marcellus
4	2/12/2019	16389.834	16222.924	60	Marcellus
5	2/12/2019	16187.142	16020.232	60	Marcellus
6	2/13/2019	15984.45	15817.54	60	Marcellus
7	2/13/2019	15781.758	15614.848	60	Marcellus
8	2/13/2019	15579.066	15412.156	60	Marcellus
9	2/13/2019	15376.374	15209.464	60	Marcellus
10	2/14/2019	15173.682	15006.772	60	Marcellus
11	2/14/2019	14970.99	14804.08	60	Marcellus
12	2/14/2019	14768.298	14601.388	60	Marcellus
13	2/14/2019	14565.606	14398.696	60	Marcellus
14	2/21/2019	14362.914	14196.004	60	Marcellus
15	2/21/2019	14160.222	13993.312	60	Marcellus
16	2/21/2019	13957.53	13790.62	60	Marcellus
17	2/22/2019	13754.838	13587.928	60	Marcellus
18	2/22/2019	13552.146	13385.236	60	Marcellus
19	2/22/2019	13349.454	13182.544	60	Marcellus
20	2/23/2019	13146.762	12979.852	60	Marcellus
21	2/24/2019	12944.07	12777.16	60	Marcellus
22	2/24/2019	12741.378	12574.468	60	Marcellus
23	2/26/2019	12538.686	12371.776	60	Marcellus
24	2/26/2019	12335.994	12169.084	60	Marcellus
25	2/26/2019	12133.302	11966.392	60	Marcellus
26	2/27/2019	11930.61	11763.7	60	Marcellus
27	2/27/2019	11727.918	11561.008	60	Marcellus
28	2/27/2019	11525.226	11358.316	60	Marcellus
29	3/1/2019	11322.534	11155.624	60	Marcellus
30	3/1/2019	11119.842	10952.932	60	Marcellus
31	3/1/2019	10917.15	10750.24	60	Marcellus
32	3/1/2019	10714.458	10547.548	60	Marcellus
33	3/2/2019	10511.766	10344.856	60	Marcellus
34	3/2/2019	10309.074	10142.164	60	Marcellus
35	3/2/2019	10106.382	9939.472	60	Marcellus
36	3/2/2019	9903.69	9736.78	60	Marcellus
37	3/2/2019	9700.998	9534.088	60	Marcellus
38	3/3/2019	9498.306	9331.396	60	Marcellus
39	3/3/2019	9295.614	9128.704	60	Marcellus
40	3/3/2019	9092.922	8926.012	60	Marcellus
41	3/3/2019	8890.23	8723.32	60	Marcellus
42	3/4/2019	8687.538	8520.628	60	Marcellus
43	3/4/2019	8484.846	8317.936	60	Marcellus
44	3/5/2019	8282.154	8115.244	60	Marcellus
45	3/5/2019	8079.462	7912.552	60	Marcellus
46	3/5/2019	7876.77	7709.86	60	Marcellus
47	3/6/2019	7674.078	7507.168	60	Marcellus
48	3/6/2019	7471.386	7304.476	60	Marcellus
49	3/6/2019	7268.694	7101.784	60	Marcellus
50	3/6/2019	7066.002	6899.092	60	Marcellus

API 47-095-02427 Farm Name Tyrone L. Beem et al Well Number Spock Unit 2H

**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	2/11/2019	71.0379	7838.957	6543	3418	264280	6464	N/A
2	2/11/2019	77.7026	8465.919	5798	5221	366520	10065	N/A
3	2/12/2019	76.0511	8317.96	5656	4002	414750	8655	N/A
4	2/12/2019	73.7868	7771.318	5273	4091	415000	8702	N/A
5	2/12/2019	74.8952	7826.391	5367	4007	413090	8421	N/A
6	2/13/2019	77.908	8253.222	5315	4129	412330	8370	N/A
7	2/13/2019	76.5494	7781.484	5501	4342	415000	8549	N/A
8	2/13/2019	75.5831	7938.886	4767	3954	417400	8708	N/A
9	2/13/2019	78.0706	8133.277	5248	3408	404580	8338	N/A
10	2/14/2019	77.653	7877.13	5339	3915	414170	8420	N/A
11	2/14/2019	75.2175	7639.72	4997	3781	413100	8293	N/A
12	2/14/2019	76.1649	8204.648	5241	3523	411000	9983	N/A
13	2/14/2019	78.8698	8032.715	5361	3579	408590	8370	N/A
14	2/21/2019	62.9486	8171.207	5477	3431	364800	11272	N/A
15	2/21/2019	76.4474	7985.342	5741	3624	415100	8337	N/A
16	2/21/2019	77.8398	7872.364	5466	3590	415970	8300	N/A
17	2/22/2019	77.9601	7834.69	5740	3519	415480	8267	N/A
18	2/22/2019	77.1849	8029.193	5495	3654	413040	8290	N/A
19	2/22/2019	49.997	8500.575	5575	4846	238720	8089	N/A
20	2/23/2019	79.0735	7844.45	5573	4021	411780	9018	N/A
21	2/24/2019	75.8253	7390.221	6167	5269	369890	11443	N/A
22	2/24/2019	77.587	7932.189	5672	3637	413020	8311	N/A
23	2/26/2019	75.9142	7752.735	5165	4116	413440	12470	N/A
24	2/26/2019	78.1839	7774.116	5676	4923	405420	8234	N/A
25	2/26/2019	80.0989	7689.248	5306	4401	414130	8249	N/A
26	2/27/2019	75.1352	7874.952	5701	5046	413130	10186	N/A
27	2/27/2019	78.4509	7684.706	6519	3896	412500	8385	N/A
28	2/27/2019	79.2051	7760.681	5856	3765	413900	8241	N/A
29	3/1/2019	61.3605	8103.453	6313	3605	411200	9854	N/A
30	3/1/2019	78.2883	7594.599	6100	3461	412380	8072	N/A
31	3/1/2019	79.0154	7594.59	5358	3697	411560	8398	N/A
32	3/1/2019	78.6649	7722.025	5998	3703	412400	8024	N/A
33	3/2/2019	79.953	7502.116	6005	3871	411500	8071	N/A
34	3/2/2019	79.0885	7563.733	5733	3725	411320	8156	N/A
35	3/2/2019	78.0874	7600.02	5445	3314	412140	8653	N/A
36	3/2/2019	80.04	7279.809	5204	3510	409630	8110	N/A
37	3/2/2019	79.8595	7438.478	4427	3659	407850	7915	N/A
38	3/3/2019	80.1062	7281.33	5089	3985	408800	7997	N/A
39	3/3/2019	80.3486	7147.408	5300	3693	410620	8067	N/A
40	3/3/2019	77.4863	7152.728	5227	3396	411580	8088	N/A
41	3/3/2019	78.9896	7149.761	6297	3543	414100	8104	N/A
42	3/4/2019	79.8282	7222.623	6163	3534	414160	8163	N/A
43	3/4/2019	78.8384	7314.983	5389	3601	410800	7940	N/A
44	3/5/2019	80.0426	7323.749	4738	3291	410786	7989	N/A
45	3/5/2019	79.578	6723.202	4082	3691	412320	8039	N/A
46	3/5/2019	79.813	7135.748	4861	3736	413400	8017	N/A
47	3/6/2019	78.9313	7206.464	5522	3775	413100	7966	N/A
48	3/6/2019	80.3075	6919.491	5584	4845	410280	8000	N/A
49	3/6/2019	78.5007	7638.827	5926	4276	416760	10290	N/A
50	3/6/2019	70.6	7760	6222	3614	410500	10774	N/A
		<b>76.5</b>	<b>7,731</b>	<b>5,520</b>	<b>3,875</b>	<b>18,093,276</b>	<b>388,070</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	75	175	75	175
Silty Shale	175	335	175	335
shaly sand	335	425	335	425
Shale	425	855	425	855
Dolomitic Shale	855	1,005	855	1,005
Shaly Siltstone	1,005	1,105	1,005	1,105
Silty Sandstone	1,105	1,325	1,105	1,325
Shaly Sand	1,325	1,475	1,325	1,475
Sandstone	1,475	1,725	1,475	1,725
Silty, Shaly, Sandstone	1,725	1,765	1,725	1,765
Sandstone, Tr Shale, Tr Coal	1,765	1,805	1,765	1,805
Silty Sandstone	1,805	1,885	1,805	1,885
Shaly Siltstone	1,885	1,928	1,885	1,956
Big Lime	1,953	2,835	1,981	2,892
Fifty Foot Sandstone	2,835	3,001	2,892	3,062
Gordon	3,001	3,161	3,062	3,225
Fifth Sandstone	3,161	3,439	3,225	3,512
Bayard	3,439	3,922	3,512	4,015
Speechley	3,922	4,146	4,015	4,252
Balltown	4,146	4,667	4,252	4,792
Bradford	4,667	5,038	4,792	5,173
Benson	5,038	5,270	5,173	5,411
Alexander	5,270	6,350	5,411	6,565
Sycamore	6,208	6,325	6,393	6,540
Middlesex	6,325	6,420	6,540	6,689
Burkett	6,420	6,454	6,689	6,762
Tully	6,454	6,482	6,762	6,852
Marcellus	6,482	NA	6,852	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:	2/11/2019
Job End Date:	3/6/2019
State:	West Virginia
County:	Tyler
API Number:	47-095-02427-00-00
Operator Name:	Antero Resources Corporation
Well Name and Number:	Spock 2H
Latitude:	39.39761100
Longitude:	-80.90760000
Datum:	NAD83
Federal Well:	NO
Indian Well:	NO
True Vertical Depth:	6,561
Total Base Water Volume (gal):	18,685,476
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	Antero Resources	Carrier/Base Fluid					
			Water	7732-18-5	100.00000	88.34423	
Sand	U.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	11.42342	
HCL Acid (12.6%-17.5%)	U.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.40000	0.09288	
			Hydrogen Chloride	7647-01-0	17.50000	0.02160	
LGC-15	U.S. Well Services, LLC	Gelling Agents					
			Guar Gum	9000-30-0	50.00000	0.02628	
			Petroleum Distillates	64742-47-8	60.00000	0.02488	
			Suspending agent (solid)	14808-60-7	3.00000	0.00402	
			Surfactant	68439-51-0	3.00000	0.00158	
WFRA-405	U.S. Well Services, LLC	Friction Reducer					
			2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.01900	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01529	

SI-1200	U.S. Well Services, LLC	Scale Inhibitor				
			Water	7732-18-5	80.00000	0.00981
			Ethylene Glycol	107-21-1	40.00000	0.00701
			Sodium Salt of Diethylenetriaminepenta (methylenephosphonic acid)	68155-78-2	10.00000	0.00123
			Sodium Chloride	7647-14-5	10.00000	0.00123
Bioclear 2000	U.S. Well Services, LLC	Anti-Bacterial Agent				
			2,2-dibromo-3-nitrilopropionamide	10222-01-2	20.00000	0.00422
			Deionized Water	7732-18-5	28.00000	0.00241
AP One	U.S. Well Services, LLC	Gel Breakers				
			Ammonium Persulfate	7727-54-0	100.00000	0.00085
AI-303	U.S. Well Services, LLC	Acid Corrosion Inhibitors				
			Ethylene glycol	107-21-1	40.00000	0.00004
			Cinnamaldehyde	104-55-2	20.00000	0.00001
			Formic acid	64-18-6	20.00000	0.00001
			Butyl cellosolve	111-76-2	20.00000	0.00001
			Polyether	60828-78-6	10.00000	0.00001
			Acetophenone,thiourea,formaldehyde polymer	68527-49-1	5.00000	0.00000

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)

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: 47-095-02427 County: Tyler  
District: Centerville Well No: Spock Unit 2H  
Farm Name: Tyrone L. Beem et al  
Discharge Date/s From:(MMDDYY) 05/31/19 To: (MMDDYY) 05/31/19  
Discharge Times. From: 0:00 To: 24:00  
Total Volume to be Disposed from this facility (gallons): 996,304

Disposal Option(s) Utilized (write volumes in gallons):

- (1) Land Application: \_\_\_\_\_ (Include a topographical map of the Area.)  
(2) UIC: 130,517 Permit No. 3400923821, 3400923823, 3400923824, 3416729731, 3416729543, 3416729464, 3416729445  
(3) Offsite Disposal: \_\_\_\_\_ Site Location: \_\_\_\_\_  
(4) Reuse: 865,787 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: 8/9/19

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: \_\_\_\_\_

LATITUDE 39°25'00"

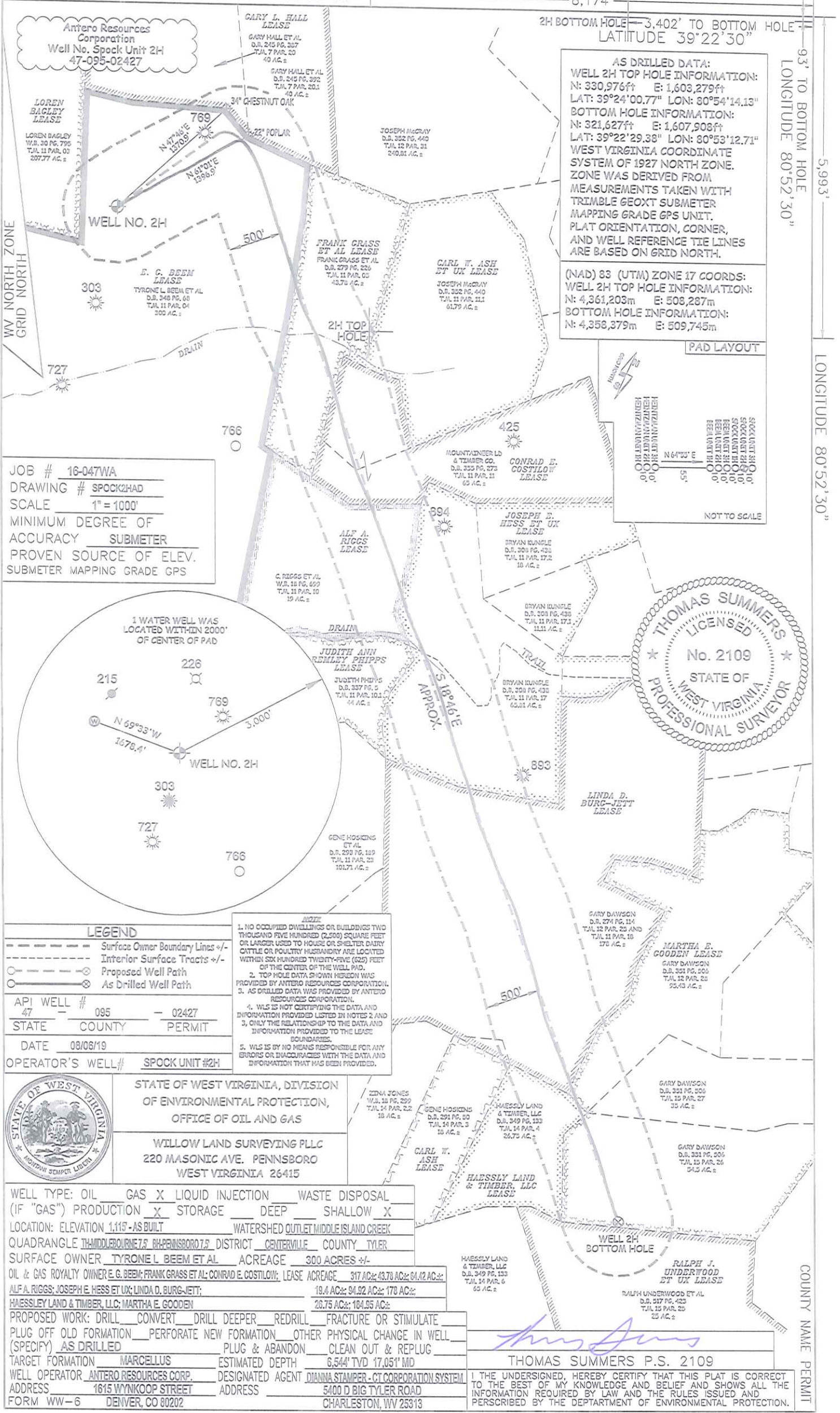
8,174'

2H BOTTOM HOLE - 3,402' TO BOTTOM HOLE  
LATITUDE 39°22'30"

93' TO BOTTOM HOLE  
LONGITUDE 80°52'30"

5,993'

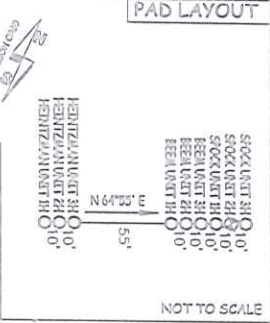
LONGITUDE 80°52'30"



**AS DRILLED DATA:**  
**WELL 2H TOP HOLE INFORMATION:**  
 N: 330,976ft E: 1,603,279ft  
 LAT: 39°24'00.77" LON: 80°54'14.13"  
**BOTTOM HOLE INFORMATION:**  
 N: 321,627ft E: 1,607,908ft  
 LAT: 39°22'29.38" LON: 80°53'12.71"  
 WEST VIRGINIA COORDINATE SYSTEM OF 1927 NORTH ZONE. ZONE WAS DERIVED FROM MEASUREMENTS TAKEN WITH TRIMBLE GEOXT SUBMETER MAPPING GRADE GPS UNIT. PLAT ORIENTATION, CORNER, AND WELL REFERENCE TIE LINES ARE BASED ON GRID NORTH.

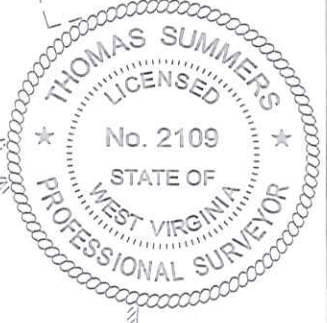
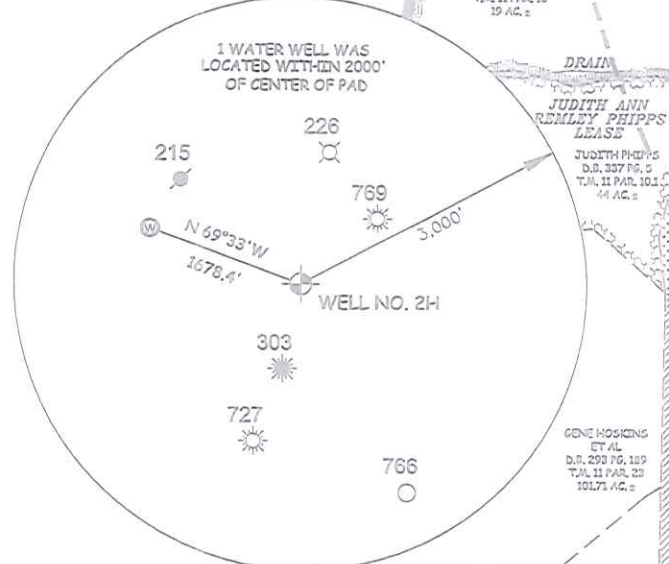
**(NAD) 83 (UTM) ZONE 17 COORDS:**  
**WELL 2H TOP HOLE INFORMATION:**  
 N: 4,361,203m E: 508,287m  
**BOTTOM HOLE INFORMATION:**  
 N: 4,358,379m E: 509,745m

PAD LAYOUT



NOT TO SCALE

JOB # 16-047WA  
 DRAWING # SPOCK2HAD  
 SCALE 1" = 1000'  
 MINIMUM DEGREE OF ACCURACY SUBMETER  
 PROVEN SOURCE OF ELEV. SUBMETER MAPPING GRADE GPS



**LEGEND**  
 - - - Surface Owner Boundary Lines +/-  
 - - - Interior Surface Tracts +/-  
 - - - Proposed Well Path  
 - - - As Drilled Well Path

API WELL # 47 095 - 02427  
 STATE COUNTY PERMIT  
 DATE 09/08/19  
 OPERATOR'S WELL# SPOCK UNIT #2H

**NOTE**  
 1. NO OCCUPIED DWELLINGS OR BUILDINGS TWO THOUSAND FIVE HUNDRED (2,500) SQUARE FEET OR LARGER USED TO HOUSE OR SHELTER DAIRY CATTLE OR POULTRY HUSBANDRY ARE LOCATED WITHIN SIX HUNDRED TWENTY-FIVE (625) FEET OF THE CENTER OF THE WELL PAD.  
 2. TOP HOLE DATA SHOWN HEREON WAS PROVIDED BY ANTERO RESOURCES CORPORATION.  
 3. AS DRILLED DATA WAS PROVIDED BY ANTERO RESOURCES CORPORATION.  
 4. WLS IS NOT CERTIFYING THE DATA AND INFORMATION PROVIDED LISTED IN NOTES 2 AND 3, ONLY THE RELATIONSHIP TO THE DATA AND INFORMATION PROVIDED TO THE LEASE BOUNDARIES.  
 5. WLS IS BY NO MEANS RESPONSIBLE FOR ANY ERRORS OR INACCURACIES WITH THE DATA AND INFORMATION THAT HAS BEEN PROVIDED.

STATE OF WEST VIRGINIA, DIVISION OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS  
 WILLOW LAND SURVEYING PLLC  
 220 MASONIC AVE. PENNSBORO WEST VIRGINIA 26415

WELL TYPE: OIL  GAS  LIQUID INJECTION  WASTE DISPOSAL   
 (IF "GAS") PRODUCTION  STORAGE  DEEP  SHALLOW   
 LOCATION: ELEVATION 1,119' AS BUILT WATERSHED OUTLET MIDDLE ISLAND CREEK  
 QUADRANGLE THIDDLEBOURNE 7.5 BH-PENNSBORO 7.5 DISTRICT CENTERVILLE COUNTY TYLER  
 SURFACE OWNER TYRONE L. BEEM ET AL ACREAGE 300 ACRES +/-  
 OIL & GAS ROYALTY OWNER E.G. BEEM; FRANK GRASS ET AL; CONRAD E. COSTILOV; LEASE ACREAGE 317 AC; 43.70 AC; 64.42 AC;  
 ALF A. RIGGS; JOSEPH E. HESS ET UX; LINDA D. BURG-JETT; 19.4 AC; 94.92 AC; 178 AC;  
 HAESSLEY LAND & TIMBER, LLC; MARTHA E. GOODEN 26.75 AC; 104.95 AC;  
 PROPOSED WORK: DRILL  CONVERT  DRILL DEEPER  DRILL DEEPER  REDRILL  FRACTURE OR STIMULATE   
 PLUG OFF OLD FORMATION  PERFORATE NEW FORMATION  OTHER PHYSICAL CHANGE IN WELL (SPECIFY) AS DRILLED  PLUG & ABANDON  CLEAN OUT & REPLUG   
 TARGET FORMATION MARCELLUS ESTIMATED DEPTH 6,544' TVD 17,051' MD  
 WELL OPERATOR ANTERO RESOURCES CORP. DESIGNATED AGENT DIANNA STAMPER - CT CORPORATION SYSTEM  
 ADDRESS 1615 WYNKOOP STREET ADDRESS 5400 D BIG TYLER ROAD  
 FORM WW-6 DENVER, CO 80202 CHARLESTON, WV 25313

THOMAS SUMMERS P.S. 2109  
 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 RULES ISSUED AND PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

COUNTY NAME PERMIT