

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

RECEIVED
Office of Oil and Gas
JUN 30 2017
WV Department of
Environmental Protection

API 47 - 91 - 01298 County Taylor District Fetterman
Quad Gladesville Pad Name OES Field/Pool Name _____
Farm name Orthodox Education Society Well Number 3HM
Operator (as registered with the OOG) PDC Mountaineer, LLC
Address 6031 Wallace Road Extension, Suite 300 City Wexford State PA Zip 15090

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4,365,673.4 Easting 588,788
Landing Point of Curve Northing 4,365,487 Easting 588,873
Bottom Hole Northing 4,367,551 Easting 588,164

Elevation (ft) 1948' 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 Oil-based Mud

Date permit issued 8/29/2014 Date drilling commenced 3/29/2015 Date drilling ceased 4/12/2015
Date completion activities began 6/5/2015 Date completion activities ceased 7/24/2015
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 245' Open mine(s) (Y/N) depths N
Salt water depth(s) ft 910' Void(s) encountered (Y/N) depths N
Coal depth(s) ft 273', 328', 414', 468' Cavern(s) encountered (Y/N) depths N
Is coal being mined in area (Y/N) N

APPROVED

NAME: Ken Graynotch
DATE: 8/04/17

Reviewed by:
EC
09/15/2017

API 47- 91 - 01298 Farm name Orthodox Education Society Well number 3HM

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"	80'	New	94	N/A	Y
Surface	17.5"	13 3/8"	630'	New	54.5	N/A	Y
Coal							
Intermediate 1	12 1/4"	9 5/8"	2576'	New	40	N/A	Y
Intermediate 2							
Intermediate 3							
Production	8 3/4" & 8 1/2"	5 1/2"	14930'	New	20	N/A	Y N
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	Grout					Surface	8
Surface	Class A 2% CaCl ₂	445	15.6	1.20	534	Surface	8
Coal							
Intermediate 1	Class A	682	15.1	1.42	1012.38	Surface	8
Intermediate 2							
Intermediate 3							
Production	Type 1 4% Gel/Type 1 2% Gel	2490	14.61	1.24	3087.6	2350'	8
Tubing							

Drillers TD (ft) 14,930' Loggers TD (ft) 14,930'
 Deepest formation penetrated Marcellus Plug back to (ft) _____
 Plug back procedure None

Kick off depth (ft) 7300' MD

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 _____
 13 3/8": 1 bow spring centralizer placed on every joint
 9 5/8": 1 bow spring centralizer placed on every third joint
 5 1/2": 1 rigid poly centralizer every joint in the lateral, 1 rigid poly centralizer every other joint through the curve, 1 rigid poly centralizer every third joint from kick off point to estimated TOC

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS The well was completed in 33 stages with 1320 .45" entry hole 22.7 gram perforating charges

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

WERE TRACERS USED Yes No TYPE OF TRACER(S) USED _____

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	6/17/2015	14821	14658	40	Marcellus
2	6/19/2015	14620	14458	40	Marcellus
3	6/20/2015	14420	14258	40	Marcellus
4	6/20/2015	14220	14058	40	Marcellus
5	6/21/2015	14020	13858	40	Marcellus
6	6/21/2015	13820	13658	40	Marcellus
7	6/21/2015	13620	13458	40	Marcellus
8	6/21/2015	13420	13258	40	Marcellus
9	6/22/2015	13220	13058	40	Marcellus
10	6/22/2015	13020	12858	40	Marcellus
11	6/22/2015	12820	12658	40	Marcellus
12	6/23/2015	12620	12458	40	Marcellus
13	6/23/2015	12420	12258	40	Marcellus
14	6/24/2015	12220	12058	40	Marcellus
15	6/24/2015	12020	11858	40	Marcellus
16	6/24/2015	11820	11658	40	Marcellus

Please insert additional pages as applicable.

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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)
1	6/19/15	71	7733	6410	4334	401300	9968	0
2	6/20/15	74	7908	6212	4717	403540	10485	0
3	6/20/15	65	7664	6448	6105	401340	11708	0
4	6/21/15	76	7924	6101	5111	400760	9670	0
5	6/21/15	76	7759	6101	5937	401260	9108	0
6	6/21/15	72	7825	6509	6005	404720	10997	0
7	6/21/15	79	8156	6394	6155	403920	9011	0
8	6/22/15	73	8316	6951	6306	307460	10051	0
9	6/22/15	76	8416	6702	5858	234240	6924	0
10	6/22/15	72	8169	6748	4696	400640	10901	0
11	6/23/15	69	8464	6741	5769	169340	6514	0
12	6/23/15	72	8106	6369	5744	260100	10501	0
13	6/24/15	70	7776	5951	5876	401640	11331	0
14	6/24/15	74	8258	6747	5983	367060	10863	0
15	6/24/15	74	8279	5997	5690	402060	9406	0
16	6/25/15	78	7812	6462	5729	403540	9113	0

Please insert additional pages as applicable.

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Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
17	6/25/2015	11620	11458	40	Marcellus
18	6/25/2015	11420	11258	40	Marcellus
19	6/25/2015	11220	11058	40	Marcellus
20	6/26/2015	11020	10858	40	Marcellus
21	6/26/2015	10820	10658	40	Marcellus
22	6/27/2015	10620	10458	40	Marcellus
23	6/27/2015	10420	10258	40	Marcellus
24	6/27/2015	10220	10058	40	Marcellus
25	6/28/2015	10020	9858	40	Marcellus
26	6/29/2015	9820	9658	40	Marcellus
27	6/29/2015	9620	9458	40	Marcellus
28	6/29/2015	9420	9258	40	Marcellus
29	6/30/2015	9220	9058	40	Marcellus
30	6/30/2015	9020	8858	40	Marcellus
31	7/1/2015	8820	8658	40	Marcellus
32	7/1/2015	8620	8458	40	Marcellus

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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)
17	6/25/15	75	7664	6409	5307	406260	8587	0
18	6/25/15	73	7718	6430	5461	405120	10686	0
19	6/26/15	79	7721	6223	5844	400600	8412	0
20	6/26/15	73	7606	6419	5465	403720	9019	0
21	6/26/15	80	7305	6412	4839	400800	7447	0
22	6/27/15	79	7209	5833	5504	401260	7543	0
23	6/27/15	78	7052	6301	5565	401300	9140	0
24	6/28/15	80	7232	6969	6005	400280	7491	0
25	6/29/15	80	7396	6255	5593	365420	6982	0
26	6/29/15	76	7594	7413	4753	401480	10710	0
27	6/29/15	84	7726	8072	6899	400000	7537	0
28	6/30/15	81	7742	6677	6155	404420	7539	0
29	6/30/15	79	7998	8147	5708	329640	8794	0
30	7/1/15	79	7666	8165	5518	404140	9185	0
31	7/1/15	75	7600	7882	6595	366940	8359	0
32	7/2/15	81	7625	6534	6466	400760	6925	0

Please insert additional pages as applicable.

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33	7/2/2015	8420	8258	40	Marcellus

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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)
33	7/2/15	79	7826	6516	4967	401580	9150	0

Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS	
	TVD	MD
_____	_____	_____
_____	_____	_____
_____	_____	_____

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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 ₂ S, ETC)
	DEPTH IN FT NAME TVD	DEPTH IN FT TVD	DEPTH IN FT MD	DEPTH IN FT MD	
Sands, Silts, and Coals	0	1042	0	1042	Sand, Silt, and Coal
Big Lime	1042	2778	1042	2779	Sandstone
Balltown	2778	2848	2779	2849	Sandstone
Bradford	3508	3558	3509	3559	Sandstone
Benson	4197	4267	4199	4269	Sandstone
Elk	4543	4593	4544	4594	Siltstone
Burkett	7476	7608	7593	7608	Shale
Tully	7608	7616	7608	7783	Limestone
Mahantango	7616	7763	7783	8011	Shale- Gas Shows
Marcellus	7763	7825	8011	14930	Shale- Gas Shows through Lateral
Purcell	7825	7828	8161	8171	Limestone
Onondaga	7861		8211		Limestone
					*Onondaga top estimated from 4709101126
					*Big Lime through Elk from 47091201126, Burkett to Lower Marcellus taken from mudlog

Please insert additional pages as applicable.

Drilling Contractor Sidewinder Drilling
Address 952 Echo Land, Suite 460 City Houston State TX Zip 77024

Logging Company _____
Address _____ City _____ State _____ Zip _____

Cementing Company Universal Well Services
Address _____ City Buckhannon State WV Zip 26201

Stimulating Company USWS
Address 770 South Post Oak Lane, Suite 405 City Houston State TX Zip 77056

Please insert additional pages as applicable.

Completed by EDDIE CARDEN Telephone 724-940-1204
Signature [Signature] Title Permitting Manager Date 4-19-17

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

09/15/2017

Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	6/19/2015
Job End Date:	7/2/2015
State:	West Virginia
County:	Taylor
API Number:	47-091-01298-00-00
Operator Name:	Mountaineer Keystone, LLC
Well Name and Number:	OES R3 HM
Longitude:	-79.96848500
Latitude:	39.43594600
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,304
Total Base Water Volume (gal):	12,799,014
Total Base Non Water Volume:	673,318

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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	Mountaineer Keystone	Base Fluid					
			Water	7732-18-5	100.00000	88.91167	
Sand	U.S. Well Services, LLC	Proppant					
			Crystalline Silica, quartz	14808-60-7	100.00000	10.40718	
HCL Acid (3% to 7.5%)	U.S. Well Services	Bulk Acid					
			Water	7732-18-5	97.00000	0.47626	
			Hydrogen Chloride	7647-01-0	7.50000	0.04276	
WFRA-1000	U.S. Well Services	Friction Reducer					
			Water	7732-18-5	60.00000	0.02743	
			2-Propenoic acid, polymer with 2 propenamide	9003-06-9	30.00000	0.01372	
			Hydrated light distillate (petroleum)	64742-47-8	30.00000	0.01125	
WFRA-405	U.S. Well Services	Friction Reducer					
			Anionic Polyacrylamide	Proprietary	40.00000	0.01518	
			Water	7732-18-5	40.00000	0.01518	
			Sodium Chloride	7647-14-5	20.00000	0.00759	
			Petroleum Distillates	64742-47-8	20.00000	0.00611	
			Ethoxylated alcohol blend	Proprietary	5.00000	0.00190	

HCL Acid (12.6%-18.0%)	U.S. Well Services, LLC	Bulk Acid					
			Water	7732-18-5	87.50000	0.03036	
			Hydrogen Chloride	7647-01-0	18.00000	0.00725	
SI-1100	U.S. Well Services	Scale Inhibitor					
			Water	7732-18-5	80.00000	0.01034	
			Ethylene Glycol	107-21-1	25.00000	0.00365	
			Copolymer of Maleic and Acrylic acid	52255-49-9	10.00000	0.00152	
			Potassium salt of diethylene triamine penta (methylene phosphonic acid)	15827-60-8	7.50000	0.00131	
			Hexamethylene triamine penta (methylene phosphonic acid)	34690-00-1	5.00000	0.00084	
			Phosphino carboxylic acid polymer	71050-62-9	5.00000	0.00084	
			Hexamethylene diamine penta (methylene phosphonic acid)	23605-74-5	2.00000	0.00034	
K-BAC 1020	U.S. Well Services	Anti-Bacterial Agent					
			2,2-dibromo-3-nitripropionamide	10222-01-2	20.00000	0.00436	
			Deionized Water	7732-18-5	28.00000	0.00249	
AI-301	U.S. Well Services	Acid Corrosion Inhibitors					
			Diethylene Glycol	111-46-6	30.00000	0.00019	
			Methenamine	100-97-0	20.00000	0.00015	
			Hydrogen Chloride	7647-01-0	10.00000	0.00007	
			Polyethylene polyamine	68603-67-8	10.00000	0.00006	
			Coco amine	61791-14-8	5.00000	0.00003	

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)

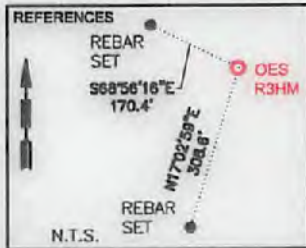
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THRASHER

THE THRASHER GROUP, INC.
600 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE 304-624-4108

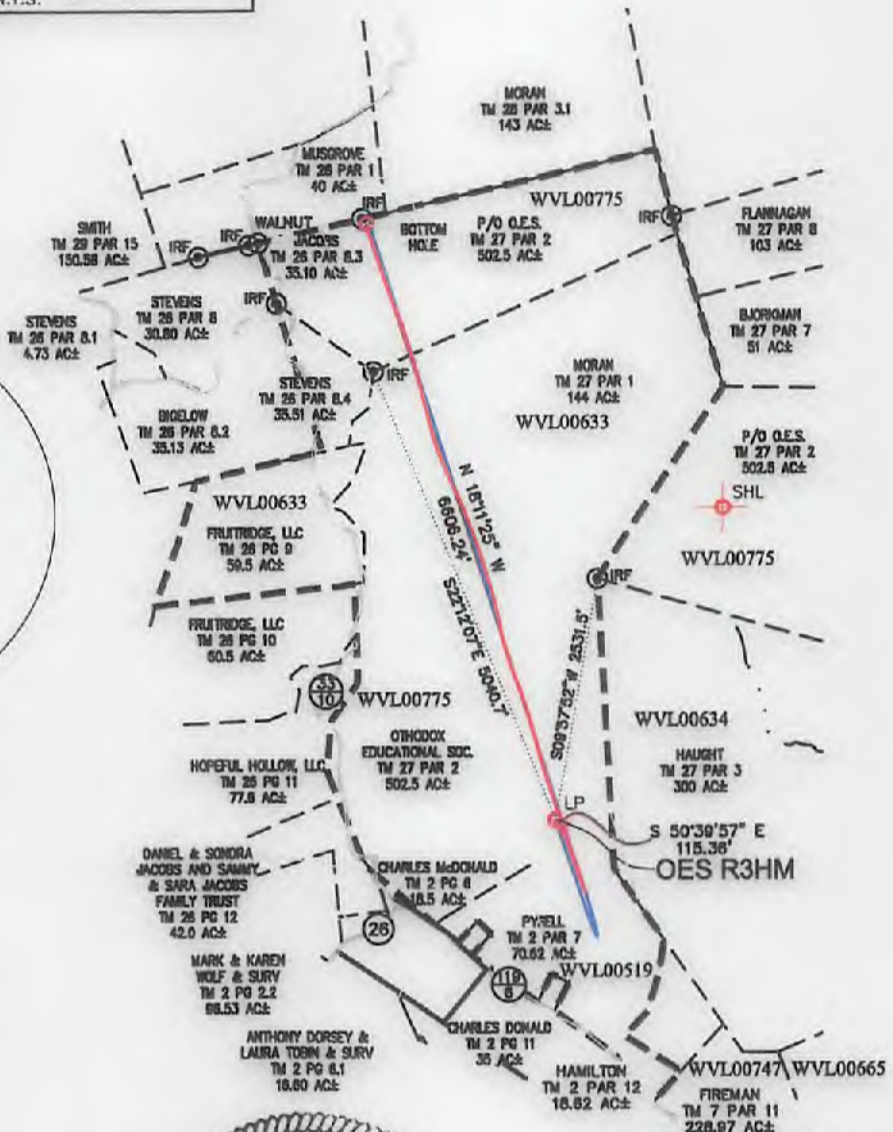
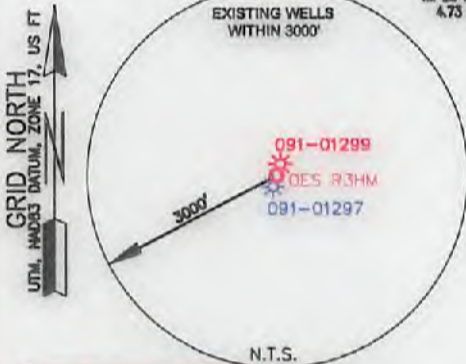
NOTES ON SURVEY

- COORDINATES SYSTEM IS WV STATE PLANE NORTH, NAD 83 DATUM, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED OF CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.



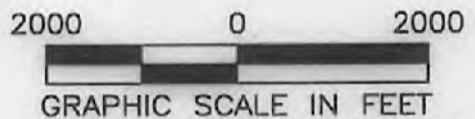
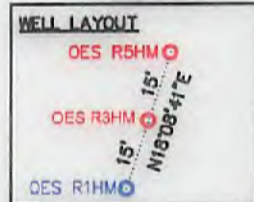
2,856' TOP HOLE
4,857' BOTTOM HOLE
LATITUDE 39°27'30"

1,935' BOTTOM HOLE
8,128' TOP HOLE
LONGITUDE 79° 57' 30"



AS-DRILLED COORDINATES	
SURFACE HOLE LOCATION (SHL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,673.391	EASTING: 588,788.622
LANDING POINT LOCATION (LPL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,651.565	EASTING: 588,816.180
BOTTOM HOLE LOCATION (BHL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,367,553.314	EASTING: 588,155.985
PROPOSED COORDINATES:	
SURFACE HOLE LOCATION (SHL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,673.4	EASTING: 588,788.6
LANDING POINT LOCATION (LPL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,487.2	EASTING: 588,873.8
BOTTOM HOLE LOCATION (BHL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,367,551.8	EASTING: 588,164.7

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 REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



P.S. 2270 *[Signature]* 6/25/17

<p>(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS</p> <p>WVDEP OFFICE OF OIL & GAS 601 57TH STREET CHARLESTON, WV 25034</p>	<p>MINIMUM DEGREE OF ACCURACY: 1/200</p> <p>PROVEN SURVEY SOURCE OF GRADE GPS ELEVATION: (NAVD 88, US FT)</p>	<p>OPERATOR'S WELL #: OES NO. R3HM</p> <p>API WELL #: 47 091 01298</p> <p>STATE COUNTY PERMIT</p>
	<p>WELL TYPE: OIL <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/> PRODUCTION <input type="checkbox"/> DEEP <input type="checkbox"/> GAS <input type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input type="checkbox"/></p> <p>WATERSHED: WHITE DAY CREEK ELEVATION: 1951.00'</p> <p>DISTRICT: FETTERMAN COUNTY: TAYLOR QUADRANGLE: GLADESVILLE 7.5'</p> <p>SURFACE OWNER: ORTHODOX EDUCATIONAL SOCIETY ACREAGE: 502.5</p> <p>OIL & GAS ROYALTY OWNER: ORTHODOX EDUCATIONAL SOCIETY/CHARLES & LAVERNE MacDONALD ACREAGE: 537.60</p> <p>DRILL <input type="checkbox"/> DRILL DEEPER <input type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input type="checkbox"/> PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input type="checkbox"/></p> <p>CONVERT <input type="checkbox"/> PLUG & ABANDON <input type="checkbox"/> CLEAN OUT & REPLUG <input type="checkbox"/> OTHER CHANGE <input checked="" type="checkbox"/> (SPECIFY) AS-DRILLED</p> <p>TARGET FORMATION: MARCELLUS SHALE ESTIMATED DEPTH: LATERAL: 7,804 TVD: 14,930 TMD</p>	<p>DESIGNATED AGENT: WILLIAM VEIGEL</p> <p>ADDRESS: 65 PROFESSIONAL PLACE, SUITE 200</p> <p>CITY: BRIDGEPORT STATE: WV ZIP CODE: 26330</p>
<p>LEGEND:</p> <ul style="list-style-type: none"> ○ PROPOSED SURFACE HOLE / BOTTOM HOLE ● EXISTING / PRODUCING WELLHEAD ○ ABANDONED WELL ○ PLUGGED & ABANDONED WELL △ CUT CONDUCTOR --- LEASE BOUNDARY --- 500' DHP BUFFER --- PROPOSED PATH --- AS-DRILLED PATH --- DHP BUFFER 	<p>REVISIONS:</p> <p>DATE: 06-21-2017</p> <p>DRAWN BY: R. DOERR</p> <p>SCALE: 1" = 2000'</p> <p>DRAWING NO: 030-3241</p> <p>WELL LOCATION PLAT</p>	

THRASHER

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 800 WHITE OAK BLVD.
 BRIDGEPORT, WV 26330
 PHONE 304-624-4100

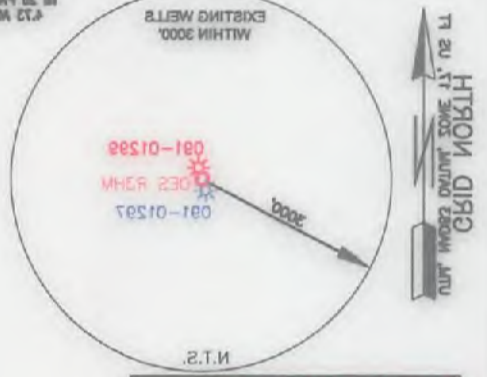
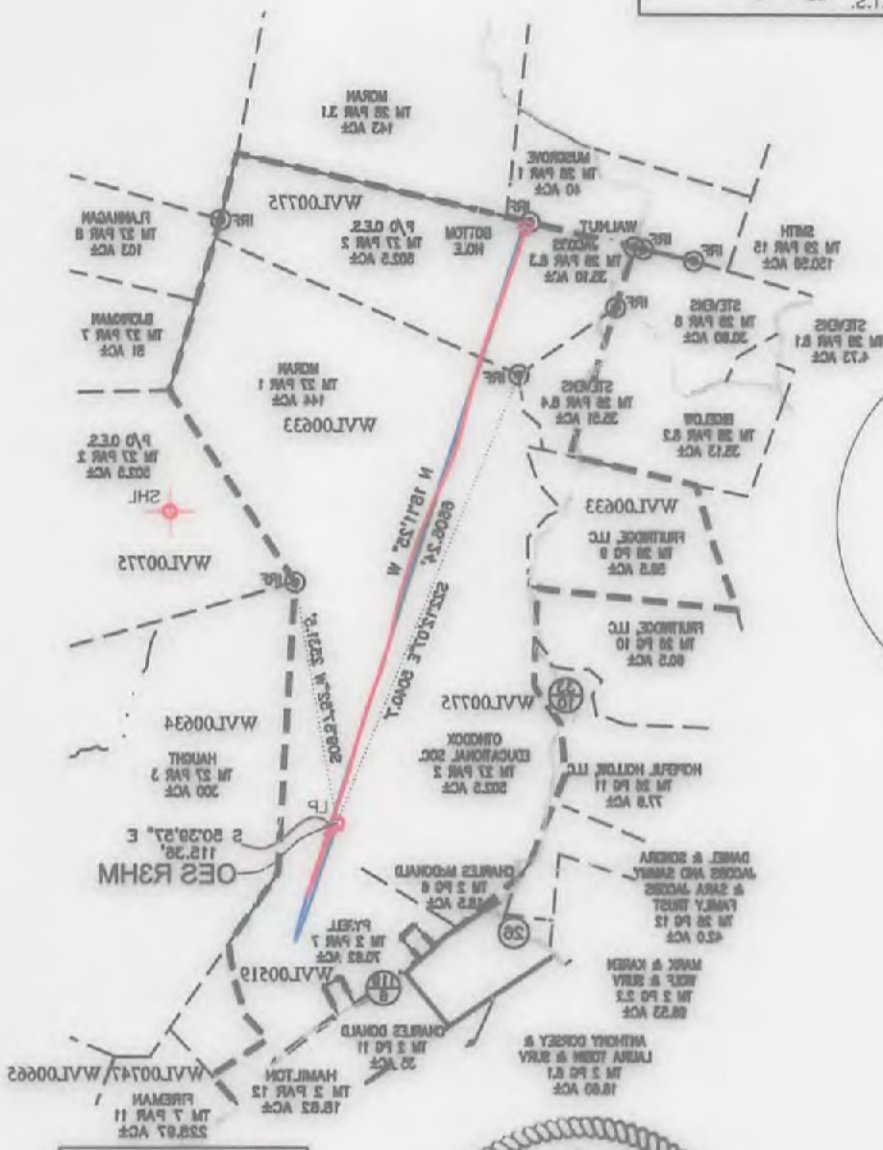
NOTES ON SURVEY

1. COORDINATES SYSTEM IS WV STATE PLANE NORTH, AND 83 DATUM, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE CP2.
2. SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
3. THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
4. NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED CENTER OF PAD.
5. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
6. NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WELLS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
7. NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.



4,857' BOTTOM HOLE
 3,856' TOP HOLE
 LATITUDE 39.27.30"

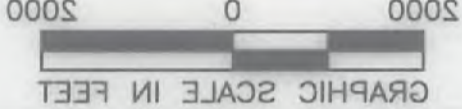
8'139, 106 HOLE
 1'332, BOLLOW HOLE



AS-DRILLED COORDINATES:	
SURFACE HOLE LOCATION (SHL):	UTM (NAD83, ZONE 17 METERS):
NORTHING: 4,382,673.301	EASTING: 288,788.622
LANDING POINT LOCATION (LPL):	UTM (NAD83, ZONE 17 METERS):
NORTHING: 4,382,621.266	EASTING: 288,816.180
BOTTOM HOLE LOCATION (BHL):	UTM (NAD83, ZONE 17 METERS):
NORTHING: 4,382,582.714	EASTING: 288,122.982
PROPOSED COORDINATES:	
SURFACE HOLE LOCATION (SHL):	UTM (NAD83, ZONE 17 METERS):
NORTHING: 4,382,673.4	EASTING: 288,788.6
LANDING POINT LOCATION (LPL):	UTM (NAD83, ZONE 17 METERS):
NORTHING: 4,382,487.2	EASTING: 288,873.8
BOTTOM HOLE LOCATION (BHL):	UTM (NAD83, ZONE 17 METERS):
NORTHING: 4,382,221.8	EASTING: 288,164.7



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 REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



ELEVATION: (NAVD 88, US FT) SOURCE OF GRADE GPS PROVEN SURVEY ACCURACY: 1/200 (+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS		WVDPE OFFICE OF OIL & GAS 801 27TH STREET CHARLESTON, WV 25024
OPERATOR'S WELL #: 091-01598 COUNTY PERMIT STATE API WELL #: 47		
MINIMUM DEGREE OF WELL ON OPERATOR'S WELL #: 091-01598		
WELLS: OIL <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/> PRODUCTION <input type="checkbox"/> DEEP <input type="checkbox"/> GAS <input type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input type="checkbox"/>		
WATERSHED: WHITE DAY CREEK DISTRICT: FETTERMAN COUNTY: TAYLOR SURFACE OWNER: ORTHODOX EDUCATIONAL SOCIETY OIL & GAS ROYALTY OWNER: ORTHODOX EDUCATIONAL SOCIETY/CHARLES & LAVARNE MacDONALD ACREAGE: 502.2 QUADRANGLE: GLADESVILLE 7.5, ELEVATION: 1921.00'		
TARGET FORMATION: MARCELLUS SHALE OTHER CHANGE <input checked="" type="checkbox"/> (SPECIFY) AS-DRILLED ESTIMATED DEPTH: LATERAL 7,804 TVD (14,920 TMD)		
WELL OPERATOR: ARSENAL RESOURCES ADDRESS: 801 WALLACE ROAD EXTENSION #300 CITY: WEXFORD STATE: PA ZIP CODE: 15080 DESIGNATED AGENT: WILLIAM VEIGEL		
REVISIONS: DATE: 08-21-2017 DRAWN BY: R. DOERR SCALE: 1" = 2000' DRAWING NO: 030-3241 WELL LOCATION PLAT		
LEGEND: PROPOSED SURFACE HOLE / BOTTOM HOLE EXISTING / PRODUCING WELLHEAD ABANDONED WELL PLUGGED & ABANDONED WELL OUT CONDUCTOR 1,500' / 2,000' DHP BUFFER AS-DRILLED PATH PROPOSED PATH 200' DHP BUFFER LEASE BOUNDARY		

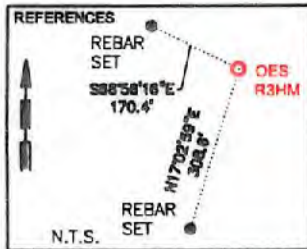
09/15/2017

THRASHER

THE THRASHER GROUP, INC.
600 WHITE OAKS BLVD.
BRIDGEPORT, WV 26330
PHONE 304-624-4108

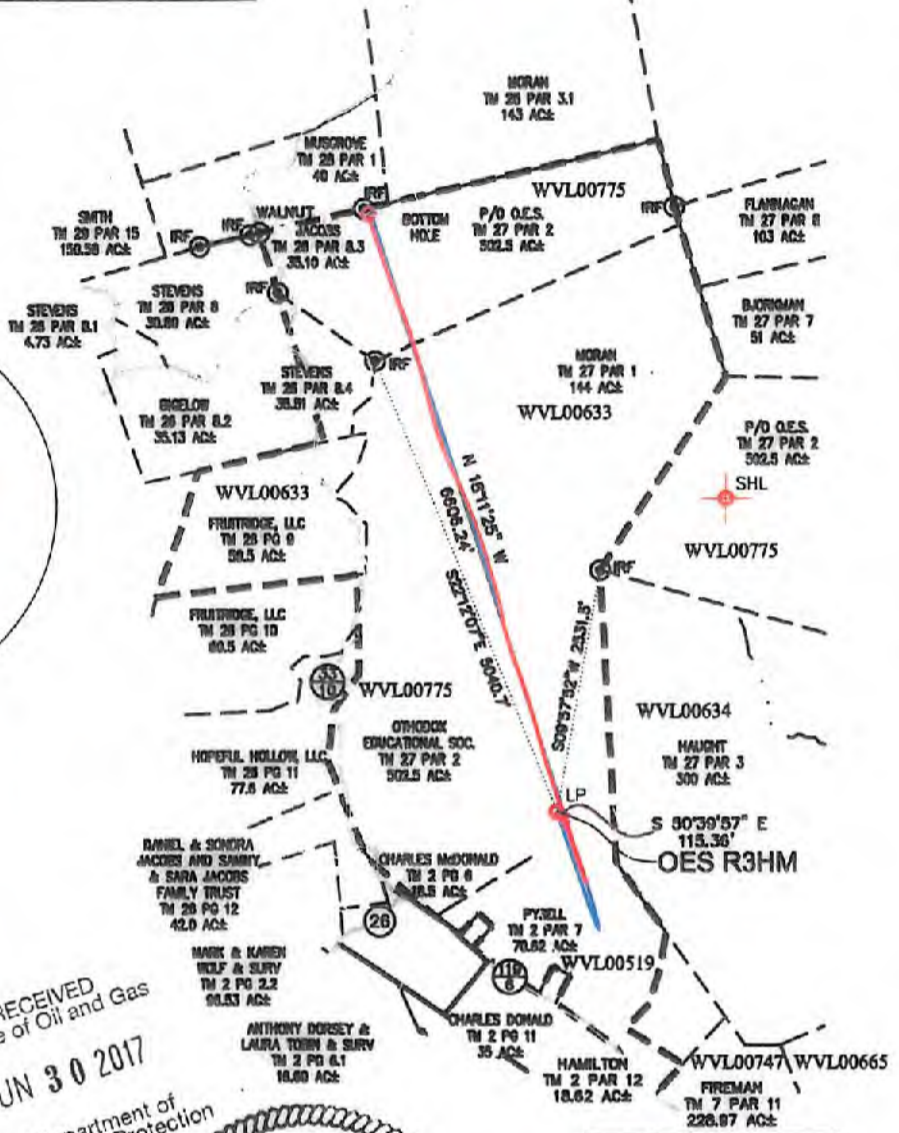
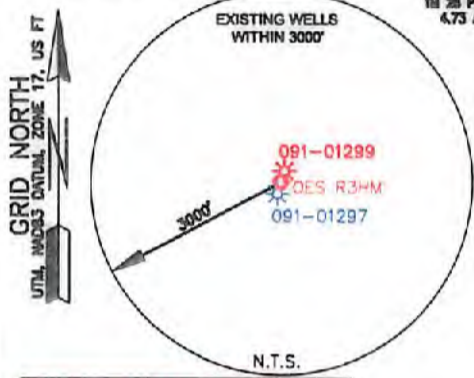
NOTES ON SURVEY

- COORDINATES SYSTEM IS WV STATE PLANE NORTH, NAD 83 DATUM, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.
- SURFACE AND ROYALTY OWNER INFORMATION AND THEIR BOUNDARIES SHOWN HEREON WERE PLOTTED FROM DEEDS AND/OR TAX PARCEL MAPS PROVIDED BY CLIENT AND FIELD LOCATIONS.
- THIS PLAT DOES NOT REPRESENT A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.
- NO DWELLINGS AND BUILDINGS WITHIN 525 FEET OF PROPOSED CENTER OF PAD.
- NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.
- NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.
- NO NATURALLY PRODUCING TROUT STREAM WITHIN 300 FEET OF LIMITS OF DISTURBANCE.



2,856' TOP HOLE
4,857' BOTTOM HOLE
LATITUDE 39°27'30"

1,935' BOTTOM HOLE
8,128' TOP HOLE
LONGITUDE 79° 57' 30"



AS-DRILLED COORDINATES	
SURFACE HOLE LOCATION (SHL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,673.391	
EASTING: 588,788.622	
LANDING POINT LOCATION (LPL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,651.565	
EASTING: 588,816.180	
BOTTOM HOLE LOCATION (BHL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,367,553.314	
EASTING: 588,155.985	
PROPOSED COORDINATES:	
SURFACE HOLE LOCATION (SHL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,673.4	
EASTING: 588,788.6	
LANDING POINT LOCATION (LPL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,365,487.2	
EASTING: 588,873.8	
BOTTOM HOLE LOCATION (BHL):	
UTM (NAD83, ZONE 17, METERS):	
NORTHING: 4,367,551.8	
EASTING: 588,164.7	

RECEIVED
Office of Oil and Gas
JUN 30 2017
WV Department of Environmental Protection



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 REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

P.S. 2270 *[Signature]* 6/25/17

	(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS	MINIMUM DEGREE OF ACCURACY: 1/200	OPERATOR'S WELL #: OES NO. R3HM
	WVDEP OFFICE OF OIL & GAS 601 57TH STREET CHARLESTON, WV 25034	PROVEN SURVEY GRADE GPS SOURCE OF ELEVATION: (NAVD 88, US FT)	API WELL #: 47
WELL TYPE: OIL <input type="checkbox"/> WASTE DISPOSAL <input type="checkbox"/> PRODUCTION <input type="checkbox"/> DEEP <input type="checkbox"/> GAS <input type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input type="checkbox"/>			
WATERSHED: WHITE DAY CREEK		ELEVATION: 1951.00'	
DISTRICT: FETTERMAN COUNTY: TAYLOR		QUADRANGLE: GLADESVILLE 7.5'	
SURFACE OWNER: ORTHODOX EDUCATIONAL SOCIETY		ACREAGE: 502.5	
OIL & GAS ROYALTY OWNER: ORTHODOX EDUCATIONAL SOCIETY/CHARLES & LAVERNE MacDONALD		ACREAGE: 537.60	
DRILL <input type="checkbox"/> DRILL DEEPER <input type="checkbox"/> REDRILL <input type="checkbox"/> FRACTURE OR STIMULATE <input type="checkbox"/> PLUG OFF OLD FORMATION <input type="checkbox"/> PERFORATE NEW FORMATION <input type="checkbox"/>			
CONVERT <input type="checkbox"/> PLUG & ABANDON <input type="checkbox"/> CLEAN OUT & REPLUG <input type="checkbox"/> OTHER CHANGE <input checked="" type="checkbox"/> (SPECIFY) AS-DRILLED			
TARGET FORMATION: MARCELLUS SHALE		ESTIMATED DEPTH: LATERAL- 7,804 TWD 14,930 TWD	
WELL OPERATOR: ARSENAL RESOURCES		DESIGNATED AGENT: WILLIAM VEIGEL	
ADDRESS: 6031 WALLACE ROAD EXTENSION #300		ADDRESS: 65 PROFESSIONAL PLACE, SUITE 200	
CITY: WEXFORD STATE: PA ZIP CODE: 15090		CITY: BRIDGEPORT STATE: WV ZIP CODE: 26330	
LEGEND:		REVISIONS:	
● PROPOSED SURFACE HOLE / BOTTOM HOLE ○ EXISTING / PRODUCING WELLHEAD ○ ABANDONED WELL ○ PLUGGED & ABANDONED WELL △ CUT CONDUCTOR		--- LEASE BOUNDARY --- 500' DHP BUFFER --- PROPOSED PATH --- AS-DRILLED PATH --- DHP BUFFER	
DATE: 06-21-2017		DRAWN BY: R. DOERR SCALE: 1" = 2000' DRAWING NO: 030-3241 WELL LOCATION PLAT	