

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

API 47 - 091 - 01345 County Taylor District Courthouse  
Quad Grafton Pad Name Coalquest 2 Field/Pool Name \_\_\_\_\_  
Farm name Coalquest Development LLC Well Number 212  
Operator (as registered with the OOG) Arsenal Resources  
Address 6031 Wallace Rd. Ext 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 4350304.795 Easting 576709.301  
Landing Point of Curve Northing 4350331.600 Easting 576962.266  
Bottom Hole Northing 4352780.218 Easting 576107.569

Elevation (ft) 1265 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 muds

Date permit issued 9/19/2017 Date drilling commenced 11/03/2017 Date drilling ceased 11/15/2017  
Date completion activities began 02/23/2017 Date completion activities ceased 02/27/2018  
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 400' Open mine(s) (Y/N) depths \_\_\_\_\_  
Salt water depth(s) ft 1110' Void(s) encountered (Y/N) depths \_\_\_\_\_  
Coal depth(s) ft 552', 630', 712', 753', 847', 881', 910' Cavern(s) encountered (Y/N) depths \_\_\_\_\_  
Is coal being mined in area (Y/N) N

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Reviewed by:  
Zel

Reviewed  
[Signature] 6-11-18

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API 47-091 - 01345 Farm name Coalquest Development LLC Well number 212

| CASING STRINGS            | Hole Size     | Casing Size | Depth      | New or Used | Grade wt/ft | Basket Depth(s) | Did cement circulate (Y/ N)<br>* Provide details below* |
|---------------------------|---------------|-------------|------------|-------------|-------------|-----------------|---|
| Conductor                 | 30"           | 24"         | 80'        | New         | 94.00       | NA              | Y   |
| Surface                   | 17.5"         | 13 3/8"     | 681' GL    | New         | 54.50       | 120'            | Y   |
| Coal                      | NA            | NA          | NA         | NA          | NA          | NA              | NA  |
| Intermediate 1            | 12 1/4"       | 9 5/8"      | 1,631' GL  | New         | 40.00       | NA              | Y   |
| Intermediate 2            | NA            | NA          | NA         | NA          | NA          | NA              | NA  |
| Intermediate 3            | NA            | NA          | NA         | NA          | NA          | NA              | NA  |
| Production                | 8 1/2"-8 3/4" | 5.5"        | 17,793' GL | New         | 20.00       | NA              | Y   |
| Tubing                    | NA            | NA          | NA         | NA          | NA          | NA              | NA  |
| Packer type and depth set |               | NA          |            |             |             |                 |   |

Comment Details Cement to surface on Conductor, Surface, Intermediate, and Production.

| 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      | A                    | 450             | 15.6            | 1.2                          | 540                       | Surface         | 8+        |
| Surface        | A                    | 640             | 15.6            | 1.2                          | 768                       | Surface         | 8+        |
| Coal           | NA                   | NA              | NA              | NA                           | NA                        | NA              | NA        |
| Intermediate 1 | A                    | 206/310         | 15.2/15.7       | 1.26/1.28                    | 260/397                   | Surface         | 8+        |
| Intermediate 2 | NA                   | NA              | NA              | NA                           | NA                        | NA              | NA        |
| Intermediate 3 | NA                   | NA              | NA              | NA                           | NA                        | NA              | NA        |
| Production     | A                    | 1217/2079       | 13.8/15.0       | 1.34/1.29                    | 1631/2682                 | Surface         | 8+        |
| Tubing         | NA                   | NA              | NA              | NA                           | NA                        | NA              | NA        |

Drillers TD (ft) 17,830 ft Loggers TD (ft) NA

Deepest formation penetrated Marcellus Plug back to (ft) NA

Plug back procedure NA

Kick off depth (ft) KOP of Curve at 7,400 ft. No Plug

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 20" - No centralizers 13 3/8" - one bow spring centralizer on every other joint 9 5/8" - one bow spring centralizer every third joint from TD to surface 5 1/2" - one semi rigid centralizer on every joint from TD of casing to end of curve. Then every other joint to KOP. Every third joint from KOP to 1,400'; there will be no centralizers from 1,400' to surface.

WAS WELL COMPLETED AS SHOT HOLE  Yes  No DETAILS 47 Stages and 1,880 perforations

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WAS WELL COMPLETED OPEN HOLE?  Yes  No DETAILS NA

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

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| Perforation Record |                  |                        |                      |                        |                 |
|--------------------|------------------|------------------------|----------------------|------------------------|-----------------|
| Stage No.          | Perforation Date | Perforated from MD ft. | Perforated to MD ft. | Number of Perforations | Formations (s)  |
| Stage # 47 of 47   | 2/27/2018 18:37  | 8,414                  | 8,576                | 40                     | Marcellus Shale |
| Stage # 46 of 47   | 2/27/2018 9:34   | 8,614                  | 8,776                | 40                     | Marcellus Shale |
| Stage # 45 of 47   | 2/27/2018 2:09   | 8,814                  | 8,976                | 40                     | Marcellus Shale |
| Stage # 44 of 47   | 2/26/2018 17:57  | 9,014                  | 9,176                | 40                     | Marcellus Shale |
| Stage # 43 of 47   | 2/26/2018 9:22   | 9,214                  | 9,376                | 40                     | Marcellus Shale |
| Stage # 42 of 47   | 2/26/2018 2:00   | 9,414                  | 9,576                | 40                     | Marcellus Shale |
| Stage # 41 of 47   | 2/25/2018 14:53  | 9,614                  | 9,776                | 40                     | Marcellus Shale |
| Stage # 40 of 47   | 2/25/2018 7:04   | 9,814                  | 9,976                | 40                     | Marcellus Shale |
| Stage # 39 of 47   | 2/24/2018 23:12  | 10,014                 | 10,176               | 40                     | Marcellus Shale |
| Stage # 38 of 47   | 2/24/2018 11:51  | 10,214                 | 10,376               | 40                     | Marcellus Shale |
| Stage # 37 of 47   | 2/24/2018 2:18   | 10,414                 | 10,576               | 40                     | Marcellus Shale |
| Stage # 36 of 47   | 2/23/2018 16:09  | 10,614                 | 10,776               | 40                     | Marcellus Shale |
| Stage # 35 of 47   | 2/23/2018 7:07   | 10,814                 | 10,976               | 40                     | Marcellus Shale |
| Stage # 34 of 47   | 2/22/2018 22:11  | 11,014                 | 11,176               | 40                     | Marcellus Shale |
| Stage # 33 of 47   | 2/22/2018 12:35  | 11,214                 | 11,376               | 40                     | Marcellus Shale |
| Stage # 32 of 47   | 2/22/2018 5:20   | 11,414                 | 11,576               | 40                     | Marcellus Shale |
| Stage # 31 of 47   | 2/21/2018 17:31  | 11,614                 | 11,776               | 40                     | Marcellus Shale |
| Stage # 30 of 47   | 2/21/2018 7:29   | 11,814                 | 11,976               | 40                     | Marcellus Shale |
| Stage # 29 of 47   | 2/20/2018 16:55  | 12,014                 | 12,176               | 40                     | Marcellus Shale |
| Stage # 28 of 47   | 2/20/2018 7:02   | 12,214                 | 12,376               | 40                     | Marcellus Shale |
| Stage # 27 of 47   | 2/19/2018 22:36  | 12,414                 | 12,576               | 40                     | Marcellus Shale |
| Stage # 26 of 47   | 2/19/2018 13:05  | 12,614                 | 12,776               | 40                     | Marcellus Shale |
| Stage # 25 of 47   | 2/19/2018 5:05   | 12,814                 | 12,976               | 40                     | Marcellus Shale |
| Stage # 24 of 47   | 2/18/2018 19:20  | 13,014                 | 13,176               | 40                     | Marcellus Shale |
| Stage # 23 of 47   | 2/18/2018 1:52   | 13,214                 | 13,376               | 40                     | Marcellus Shale |
| Stage # 22 of 47   | 2/17/2018 15:43  | 13,414                 | 13,576               | 40                     | Marcellus Shale |
| Stage # 21 of 47   | 2/17/2018 0:08   | 13,614                 | 13,776               | 40                     | Marcellus Shale |
| Stage # 20 of 47   | 2/16/2018 3:48   | 13,814                 | 13,976               | 40                     | Marcellus Shale |
| Stage # 19 of 47   | 2/15/2018 10:19  | 14,014                 | 14,176               | 40                     | Marcellus Shale |
| Stage # 18 of 47   | 2/14/2018 11:01  | 14,214                 | 14,376               | 40                     | Marcellus Shale |
| Stage # 17 of 47   | 2/13/2018 13:00  | 14,414                 | 14,576               | 40                     | Marcellus Shale |
| Stage # 16 of 47   | 2/12/2018 10:30  | 14,614                 | 14,776               | 40                     | Marcellus Shale |
| Stage # 15 of 47   | 2/11/2018 10:54  | 14,814                 | 14,976               | 40                     | Marcellus Shale |
| Stage # 14 of 47   | 2/10/2018 9:30   | 15,014                 | 15,176               | 40                     | Marcellus Shale |
| Stage # 13 of 47   | 2/9/2018 22:23   | 15,214                 | 15,376               | 40                     | Marcellus Shale |
| Stage # 12 of 47   | 2/9/2018 10:30   | 15,414                 | 15,576               | 40                     | Marcellus Shale |
| Stage # 11 of 47   | 2/8/2018 22:37   | 15,614                 | 15,776               | 40                     | Marcellus Shale |
| Stage # 10 of 47   | 2/8/2018 11:16   | 15,814                 | 15,976               | 40                     | Marcellus Shale |
| Stage # 9 of 47    | 2/7/2018 23:20   | 16,014                 | 16,176               | 40                     | Marcellus Shale |
| Stage # 8 of 47    | 2/7/2018 11:23   | 16,214                 | 16,376               | 40                     | Marcellus Shale |
| Stage # 7 of 47    | 2/6/2018 14:28   | 16,414                 | 16,576               | 40                     | Marcellus Shale |
| Stage # 6 of 47    | 2/5/2018 23:39   | 16,614                 | 16,776               | 40                     | Marcellus Shale |

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|                 |                  |        |        |    |                 |
|-----------------|------------------|--------|--------|----|-----------------|
| Stage # 5 of 47 | 2/5/2018 15:27   | 16,814 | 16,976 | 40 | Marcellus Shale |
| Stage # 4 of 47 | 2/4/2018 23:33   | 17,014 | 17,176 | 40 | Marcellus Shale |
| Stage # 3 of 47 | 2/4/2018 5:32    | 17,214 | 17,376 | 40 | Marcellus Shale |
| Stage # 2 of 47 | 2/3/2018 14:26   | 17,414 | 17,576 | 40 | Marcellus Shale |
| Stage # 1 of 47 | 12/21/2017 12:01 | 17,614 | 17,777 | 40 | Marcellus Shale |

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| Stimulation Information Per 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) |
| 1                                 | 02/03/2018        | 72.00               | 8,261                        | 5963                         | 4,846      | 470,520                  | 13,770                 |
| 2                                 | 02/03/2018        | 65.00               | 8,245                        | 6614                         | 4,545      | 504,980                  | 14,960                 |
| 3                                 | 02/04/2018        | 70.00               | 7,886                        | 6631                         | 4,970      | 500,340                  | 13,287                 |
| 4                                 | 02/05/2018        | 70.00               | 8,428                        | 6942                         | 5,477      | 487,740                  | 12,733                 |
| 5                                 | 02/05/2018        | 67.00               | 7,978                        | 5954                         | 5,273      | 497,320                  | 12,994                 |
| 6                                 | 02/06/2018        | 71.00               | 7,842                        | 6091                         | 5,133      | 500,840                  | 12,957                 |
| 7                                 | 02/07/2018        | 70.00               | 7,748                        | 5850                         | 5,516      | 505,600                  | 13,886                 |
| 8                                 | 02/07/2018        | 72.10               | 7,597                        | 5984                         | 5,212      | 504,900                  | 13,095                 |
| 9                                 | 02/08/2018        | 72.00               | 7,676                        | 6484                         | 5,548      | 502,000                  | 12,605                 |
| 10                                | 02/08/2018        | 69.80               | 7,697                        | 6674                         | 4,907      | 496,260                  | 12,780                 |
| 11                                | 02/09/2018        | 72.00               | 7,679                        | 5998                         | 5,169      | 501,480                  | 11,802                 |
| 12                                | 02/09/2018        | 72.80               | 7,777                        | 6592                         | 5,211      | 495,020                  | 11,511                 |
| 13                                | 02/10/2018        | 74.00               | 7,842                        | 6378                         | 5,757      | 495,100                  | 12,247                 |
| 14                                | 02/11/2018        | 73.00               | 7,495                        | 6374                         | 5,664      | 499,960                  | 11,709                 |
| 15                                | 02/12/2018        | 64.00               | 8,147                        | 6716                         | 5,983      | 495,760                  | 14,752                 |
| 16                                | 02/13/2018        | 49.00               | 8,341                        | 6177                         | 5,601      | 366,580                  | 15,006                 |
| 17                                | 02/14/2018        | 81.00               | 8,205                        | 6077                         | 5,354      | 500,120                  | 12,648                 |
| 18                                | 02/15/2018        | 81.00               | 8,337                        | 6236                         | 5,572      | 501,600                  | 11,807                 |
| 19                                | 02/15/2018        | 76.40               | 8,077                        | 6446                         | 5,108      | 504,280                  | 12,988                 |
| 20                                | 02/16/2018        | 78.10               | 8,166                        | 7064                         | 5,818      | 499,340                  | 13,293                 |
| 21                                | 02/17/2018        | 75.00               | 8,508                        | 7001                         | 5,977      | 505,000                  | 12,585                 |
| 22                                | 02/17/2018        | 71.60               | 8,102                        | 6808                         | 5,333      | 467,180                  | 12,908                 |
| 23                                | 02/18/2018        | 80.20               | 8,430                        | 6157                         | 5,879      | 496,660                  | 11,657                 |
| 24                                | 02/18/2018        | 53.84               | 8,490                        | 6150                         | 5,091      | 393,140                  | 13,994                 |
| 25                                | 02/19/2018        | 77.00               | 8,304                        | 6033                         | 5,091      | 495,120                  | 11,911                 |
| 26                                | 02/19/2018        | 73.40               | 8,376                        | 5967                         | 5,212      | 500,180                  | 13,737                 |
| 27                                | 02/20/2018        | 71.50               | 8,315                        | 6520                         | 5,576      | 484,920                  | 14,326                 |
| 28                                | 02/20/2018        | 65.00               | 8,535                        | 6180                         | 5,758      | 357,340                  | 13,052                 |
| 29                                | 02/21/2018        | 73.00               | 8,031                        | 6283                         | 5,364      | 496,000                  | 12,145                 |
| 30                                | 02/21/2018        | 71.00               | 8,457                        | 6445                         | 5,211      | 499,720                  | 13,674                 |
| 31                                | 02/22/2018        | 71.00               | 8,112                        | 6055                         | 5,218      | 497,760                  | 13,228                 |
| 32                                | 02/22/2018        | 74.00               | 8,341                        | 6872                         | 5,515      | 499,660                  | 10,097                 |
| 33                                | 02/22/2018        | 74.00               | 8,007                        | 6335                         | 5,784      | 490,680                  | 10,819                 |
| 34                                | 02/23/2018        | 75.00               | 7,986                        | 6818                         | 5,576      | 495,980                  | 11,233                 |
| 35                                | 02/23/2018        | 78.00               | 8,356                        | 6582                         | 5,455      | 495,060                  | 10,415                 |
| 36                                | 02/23/2018        | 69.00               | 7,892                        | 6278                         | 5,524      | 503,560                  | 12,725                 |
| 37                                | 02/24/2018        | 64.00               | 8,509                        | 6231                         | 5,697      | 466,760                  | 14,906                 |
| 38                                | 02/24/2018        | 70.00               | 7,861                        | 6111                         | 5,421      | 495,640                  | 14,340                 |
| 39                                | 02/25/2018        | 71.00               | 7,950                        | 6111                         | 5,101      | 500,400                  | 13,471                 |
| 40                                | 02/25/2018        | 75.00               | 7,983                        | 5930                         | 5,999      | 504,140                  | 13,533                 |
| 41                                | 02/25/2018        | 80.00               | 7,442                        | 6577                         | 5,702      | 504,720                  | 10,868                 |
| 42                                | 02/26/2018        | 81.00               | 7,342                        | 6464                         | 5,941      | 495,180                  | 9,471                  |
| 43                                | 02/26/2018        | 76.00               | 7,671                        | 6534                         | 5,879      | 422,950                  | 11,033                 |

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|----|------------|-------|-------|------|-------|---------|--------|
| 44 | 02/26/2018 | 74.00 | 7,359 | 6174 | 4,976 | 499,660 | 11,559 |
| 45 | 02/27/2018 | 81.00 | 7,275 | 6413 | 5,515 | 496,960 | 10,236 |
| 46 | 02/27/2018 | 77.00 | 7,732 | 6201 | 5,064 | 501,800 | 12,617 |
| 47 | 02/27/2018 | 77.00 | 7,643 | 7176 | 5,074 | 500,560 | 11,546 |

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API 47- 091 - 01345 Farm name Coalquest Development LLC Well number 212

| <u>PRODUCING FORMATION(S)</u> | <u>DEPTHS</u> |       |            |
|-------------------------------|---------------|-------|------------|
| Marcellus Shale               | 7,803'        | TVD   | 17,830' 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/<br>FORMATION | TOP<br>DEPTH IN FT<br>NAME TVD | BOTTOM<br>DEPTH IN FT<br>TVD | TOP<br>DEPTH IN FT<br>MD | BOTTOM<br>DEPTH IN FT<br>MD | DESCRIBE ROCK TYPE AND RECORD QUANTITY AND<br>TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC) |
|-------------------------|--------------------------------|------------------------------|--------------------------|-----------------------------|--|
| Sand/Silt               | 0                              | 552                          | 0                        | 552                         | Freshwater @ 400'  |
| Sand/Silt/Coal          | 552                            | 711                          | 552                      | 712                         | Bakerstown Coal @ 552' TVD, Brush Creek Coal @ 630'TVD   |
| Sand/Silt/Coal          | 711                            | 846                          | 712                      | 847                         | Upper Freeport @ 711' TVD, Lower Freeport @ 753' TVD   |
| Sand/Silt/Coal          | 846                            | 1662                         | 847                      | 1665                        | Upper Kittanning @ 846' TVD, Middle Kittanning @ 880' TVD, Lower Kittanning @ 909' TVD, Saltwater @ 1,100'       |
| Big Lime                | 1662                           | 1777                         | 1665                     | 1780                        | Limestone  |
| Balltown                | 3265                           | 3315                         | 3320                     | 3370                        | Sandstone  |
| Elk Siltstone           | 4830                           | 4883                         | 4970                     | 5023                        | Siltstone  |
| Burkett                 | 7425                           | 7459                         | 7806                     | 7846                        | Shale  |
| Tully                   | 7459                           | 7521                         | 7846                     | 7925                        | Limestone  |
| Mahantango              | 7521                           | 7695                         | 7925                     | 8215                        | Shale  |
| Marcellus               | 7695                           | 7755                         | 8215                     | 8399                        | Shale  |
| Purcell                 | 7755                           | 7759                         | 8399                     | 8416                        | Limestone  |
| Lower Marcellus         | 7759                           | 7792*                        | 8416                     | 17830                       | Shale - Gas shows through lateral  |
| Onondaga                | 7792*                          |                              |                          |                             | *Onondaga not penetrated - top estimated based on 4709101108 thickness   |

Please insert additional pages as applicable.

Drilling Contractor H&P  
Address 1437 South Boulder Ave. City Tulsa State OK Zip 74119

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

Cementing Company C&J Energy Services, Inc.  
Address 1650 Hackers Creek City Jane Lew State WV Zip 26078

Stimulating Company Keane Group  
Address 2121 Sage Road City Houston State TX Zip 77058

Please insert additional pages as applicable.

Completed by Arsenal Resources Telephone 304-629-6309  
Signature [Signature] Title Permitting Manager Date 5/30/18

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

07/20/2018



# Hydraulic Fracturing Fluid Product Component Information Disclosure

|                                |                    |
|--------------------------------|--------------------|
| Job Start Date:                | 2/3/2018           |
| Job End Date:                  | 2/27/2018          |
| State:                         | West Virginia      |
| County:                        | Taylor             |
| API Number:                    | 47-091-01345-00-00 |
| Operator Name:                 | Arsenal Resources  |
| Well Name and Number:          | Coal Quest II 212H |
| Latitude:                      | 39.29872800        |
| Longitude:                     | -80.11038100       |
| Datum:                         | NAD83              |
| Federal Well:                  | NO                 |
| Indian Well:                   | NO                 |
| True Vertical Depth:           | 7,702              |
| Total Base Water Volume (gal): | 25,477,746         |
| Total Base Non Water Volume:   | 0                  |



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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                    | Ascent   | Carrier/Base Fluid |   |  |  |  |          |
|                          |          |                    | Water                                       | 7732-18-5                                | 100.00000  | 89.84423   | None     |
| Sand (Proppant)          | Keane    | Proppant           |   |  |  |  |          |
|                          |          |                    | Crystalline silica: Quartz (SiO2)           | 14808-60-7                               | 100.00000  | 9.67545  | None     |
| Hydrochloric Acid (7.5%) | Keane    | Acid Inhibitor     |   |  |  |  |          |
|                          |          |                    | Water                                       | 7732-18-5                                | 92.50000   | 0.33244  | None     |
|                          |          |                    | Hydrochloric Acid                           | 7647-01-0                                | 7.50000  | 0.02695  | None     |
| KFR-16FW                 | Keane    | Friction Reducer   |   |  |  |  |          |
|                          |          |                    | Water                                       | 7732-18-5                                | 60.00000   | 0.05795  | None     |
|                          |          |                    | Distillates (petroleum), hydrotreated light | 64742-47-8                               | 20.00000   | 0.01932  | None     |
|                          |          |                    | oleic acid diethanolamide                   | 93-83-4                                  | 1.50000  | 0.00145  | None     |
|                          |          |                    | ammonium chloride                           | 12125-02-9                               | 1.50000  | 0.00145  | None     |
|                          |          |                    | alcohols, C12-16, ethoxylated               | 68551-12-2                               | 1.00000  | 0.00097  | None     |
| MBC-516                  | Keane    | Biocide            |   |  |  |  |          |
|                          |          |                    | Water                                       | 7732-18-5                                | 56.70000   | 0.00520  | None     |
|                          |          |                    | Glutaral                                    | 111-30-8                                 | 26.70000   | 0.00245  | None     |

|  |              |                        |   |            |          |         |      |
|--|--------------|------------------------|---|------------|----------|---------|------|
|  |              |                        | didecyldimethylammonium chloride                                      | 7173-51-5  | 8.00000  | 0.00073 | None |
|  |              |                        | quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides | 68424-85-1 | 5.30000  | 0.00049 | None |
|  |              |                        | ethonal   | 64-17-5    | 2.80000  | 0.00026 | None |
| KLSI-21  | Keane        | Scale Inhibitor        |   |            |          |         |      |
|  |              |                        | polyphosphoric acids, esters with triethanolamine, sodium salts       | 68131-72-6 | 30.00000 | 0.00406 | None |
| KAI-12   | Keane        | Acid Inhibitor         |   |            |          |         |      |
|  |              |                        | Ethylene glycol   | 107-21-1   | 40.00000 | 0.00065 | None |
|  |              |                        | dipropylene glycol, monomethyl ether                                  | 34590-94-8 | 20.00000 | 0.00033 | None |
|  |              |                        | formic acid   | 64-18-6    | 10.00000 | 0.00016 | None |
|  |              |                        | Ethoxylated alcohol   | 68131-39-5 | 10.00000 | 0.00016 | None |
|  |              |                        | Cinnamaldehyde  | 104-55-2   | 10.00000 | 0.00016 | None |
|  |              |                        | Tar bases, quinoline derivs., benzyl chloride-quaternized             | 72480-70-7 | 10.00000 | 0.00016 | None |
|  |              |                        | isopropyl alcohol   | 67-63-0    | 5.00000  | 0.00008 | 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 |   |            |          |         |      |
|  |              |                        | Water   | 7732-18-5  | 92.50000 | 0.33244 |      |
|  |              |                        | Distillates (petroleum), hydrotreated light                           | 64742-47-8 | 20.00000 | 0.01932 |      |
|  |              |                        | Glutaral  | 111-30-8   | 26.70000 | 0.00245 |      |
|  |              |                        | oleic acid diethanolamide   | 93-83-4    | 1.50000  | 0.00145 |      |
|  |              |                        | ammonium chloride   | 12125-02-9 | 1.50000  | 0.00145 |      |
|  |              |                        | alcohols, C12-16, ethoxylated   | 68551-12-2 | 1.00000  | 0.00097 |      |
|  |              |                        | didecyldimethylammonium chloride                                      | 7173-51-5  | 8.00000  | 0.00073 |      |
|  |              |                        | quaternary ammonium compounds, benzyl-C12-16-alkyldimethyl, chlorides | 68424-85-1 | 5.30000  | 0.00049 |      |
|  |              |                        | dipropylene glycol, monomethyl ether                                  | 34590-94-8 | 20.00000 | 0.00033 |      |
|  |              |                        | ethonal   | 64-17-5    | 2.80000  | 0.00026 |      |
|  |              |                        | Tar bases, quinoline derivs., benzyl chloride-quaternized             | 72480-70-7 | 10.00000 | 0.00016 |      |
|  |              |                        | formic acid   | 64-18-6    | 10.00000 | 0.00016 |      |
|  |              |                        | Ethoxylated alcohol   | 68131-39-5 | 10.00000 | 0.00016 |      |
|  |              |                        | Cinnamaldehyde  | 104-55-2   | 10.00000 | 0.00016 |      |
|  |              |                        | isopropyl alcohol   | 67-63-0    | 5.00000  | 0.00008 |      |
|  |              |                        | Water   | 7732-18-5  | 85.00000 |         |      |

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WV Department of  
Environmental Protection

\* 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)



# THRASHER

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

## NOTES ON SURVEY

- COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17, 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 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.

GRID NORTH  
UTM, NAD83 DATUM, ZONE 17, US FT

| LINE | DESCRIPTION   | DISTANCE | DESCRIPTION     | MONUMENT          |
|------|---------------|----------|-----------------|-------------------|
| L1   | S 75°55'40" W | 1038.60  | SHL TO LANDMARK | FENCE POST CORNER |
| L2   | S 05°30'32" E | 581.46   | SHL TO LANDMARK | WELL# 1252        |
| L3   | N 25°34'38" E | 176.04   | SHL TO LANDMARK | REBAR SET         |
| L4   | S 30°05'06" E | 302.13   | SHL TO LANDMARK | REBAR SET         |

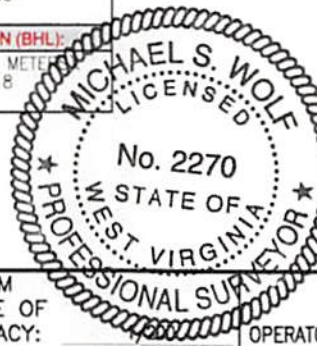
| TRACT | SURFACE OWNER                 | TAX PARCEL | ACRES  |
|-------|-------------------------------|------------|--------|
| 1     | COALQUEST DEVELOPMENT LLC     | 5-8-10.2   | 10.0   |
| 2     | COALQUEST DEVELOPMENT LLC     | 5-8-10     | 63.99  |
| 3     | COALQUEST DEVELOPMENT LLC     | 5-8-10.1   | 9.10   |
| 4     | RICOTTILLI C                  | 5-8-10.3   | 214.97 |
| 5     | COALQUEST DEVELOPMENT LLC     | 5-8-26     | 1.14   |
| 6     | COALQUEST DEVELOPMENT LLC     | 5-8-9      | 15.98  |
| 7     | MELINDA L PETROFF             | 3-20-5     | 58.39  |
| 8     | HOWARD AND KATRINA GAINES     | 3-20-3.5   | 7.20   |
| 9     | VIVIAN & ROBERT W SICKLES     | 3-20-3.3   | 8.40   |
| 10    | MILFORD P & BARBARA MCDANIEL  | 3-20-2.5   | 0.95   |
| 11    | MILFORD P & BARBARA MCDANIEL  | 3-16-64    | 5.98   |
| 12    | WILLIAM T & REBECCA L JENKINS | 3-16-57    | 32.0   |
| 13    | PAUL R & WILMA W DAVIS        | 3-16-50.1  | 4.0    |
| 14    | M & M PROPERTY OPERATIONS     | 3-16-50.2  | 0.33   |
| 15    | JAY S SPRINGER & MARY M GERBA | 3-16-50.6  | 7.74   |

| TRACT | ADJOINER        | TAX PARCEL | TRACT | ADJOINER | TAX PARCEL |
|-------|-----------------|------------|-------|----------|------------|
| A     | GERARD          | 5-13A-13   | Y     | FLEMING  | 5-8A-6     |
| B     | FOWLER          | 5-13-11    | Z     | BAKER    | 3-20-2     |
| C     | FOWLER          | 5-13-10    | AA    | SIMONS   | 03-20-2.4  |
| D     | BARTLETT        | 5-13-9     | BB    | MCDANIEL | 03-20-2.6  |
| E     | COOK            | 5-13-7     | CC    | BAKER    | 03-16-64.1 |
| F     | ZBOSNIK         | 5-13-7.2   | DD    | HARBERT  | 03-16-65   |
| G     | ZBOSNIK         | 5-13-7.1   |       |          |            |
| H     | AUVIL           | 5-13-5     |       |          |            |
| I     | AUVIL           | 5-13-5.3   |       |          |            |
| J     | CURRY           | 5-13-5.5   |       |          |            |
| K     | BANKING & TRUST | 5-13-5.4   |       |          |            |
| L     | FELTON          | 5-8-11.2   |       |          |            |
| M     | POLING          | 5-8-11.1   |       |          |            |
| N     | POLING          | 5-8-11     |       |          |            |
| O     | POLEN           | 5-8A-12    |       |          |            |
| P     | FLEMING         | 5-8A-11    |       |          |            |
| Q     | FLEMING         | 5-8A-10    |       |          |            |
| R     | KETTERMAN       | 5-8A-14    |       |          |            |
| S     | KETTERMAN       | 5-8A-7     |       |          |            |
| T     | LIPSCOMB        | 5-8A-4     |       |          |            |
| U     | LIPSCOMB        | 5-8A-3     |       |          |            |
| V     | CAMPBELL        | 5-8A-2     |       |          |            |
| W     | GREEN           | 5-8A-1     |       |          |            |
| X     | ROSS            | 5-8A-5     |       |          |            |

|  |
|--|
| <b>SURFACE HOLE LOCATION (SHL):</b><br>UTM (NAD83, ZONE 17, METERS):<br>NORTHING: 4,350,304.795<br>EASTING: 576,709.298  |
| <b>LANDING POINT LOCATION (LPL):</b><br>UTM (NAD83, ZONE 17, METERS):<br>NORTHING: 4,350,088.445<br>EASTING: 577,042.614 |
| <b>BOTTOM HOLE LOCATION (BHL):</b><br>UTM (NAD83, ZONE 17, METERS):<br>NORTHING: 4,352,777.610<br>EASTING: 576,115.221   |
| <b>SURFACE HOLE LOCATION (SHL):</b><br>UTM (NAD83, ZONE 17, METERS):<br>NORTHING: 4,350,304.795<br>EASTING: 576,709.301  |
| <b>LANDING POINT LOCATION (LPL):</b><br>UTM (NAD83, ZONE 17, METERS):<br>NORTHING: 4,350,331.600<br>EASTING: 576,962.266 |
| <b>BOTTOM HOLE LOCATION (BHL):</b><br>UTM (NAD83, ZONE 17, METERS):<br>NORTHING: 4,352,780.218<br>EASTING: 576,107.569   |

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



GRAPHIC SCALE IN FEET

|   |   |   |
|---|---|---|
| <p>(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS</p> <p>WVDEP<br/>OFFICE OF OIL &amp; GAS<br/>601 57TH STREET<br/>CHARLESTON, WV 25034</p> | <p>MINIMUM DEGREE OF ACCURACY:</p> <p>PROVEN SOURCE OF ELEVATION: SURVEY GRADE GPS (NAVD 88, US FT)</p>   | <p>OPERATOR'S WELL #:</p> <p>API WELL #: 47 91</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 checked="" type="checkbox"/> LIQUID INJECTION <input type="checkbox"/> STORAGE <input type="checkbox"/> SHALLOW <input checked="" type="checkbox"/></p> <p>WATERSHED: SAND LICK RUN OF SIMPSON CREEK</p> <p>DISTRICT: COURTHOUSE COUNTY: TAYLOR</p> <p>SURFACE OWNER: COALQUEST DEVELOPMENT LLC</p> <p>OIL &amp; GAS ROYALTY OWNER: PATRIOT MINING, INC.</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 &amp; ABANDON <input type="checkbox"/> CLEAN OUT &amp; REPLUG <input type="checkbox"/> OTHER CHANGE <input checked="" type="checkbox"/> (SPECIFY) AS-DRILLED</p> <p>TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: 7,803 TVD</p> | <p>COALQUEST 2</p> <p>WELL #:</p> <p>212</p>                                  |



COORDINATES SYSTEM IS UTM, NAD 83 DATUM, ZONE 17, U.S. FOOT AND WELL COORDINATES ESTABLISHED USING SURVEY GRADE GPS.  
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 REPRESENTATIVE. A BOUNDARY SURVEY OF THE PARCELS SHOWN HEREON.  
3. NO DWELLINGS AND BUILDINGS WITHIN 625 FEET OF PROPOSED SURFACE OR CENTER OF ROAD.  
4. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL.  
5. NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE LIMITS OF DISTURBANCE.  
6. NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 300 FEET OF THE LIMITS OF DISTURBANCE.  
7. NO NATURALLY PRODUCING TIGHT STREAM WITHIN 500 FEET OF LIMITS OF DISTURBANCE.

**NOTES ON SURVEY**  
GRID NORTH  
UTM, NAD83 DATUM, ZONE 17, U.S. FT.  
POLING  
BYERS  
SPRINGER  
BHL

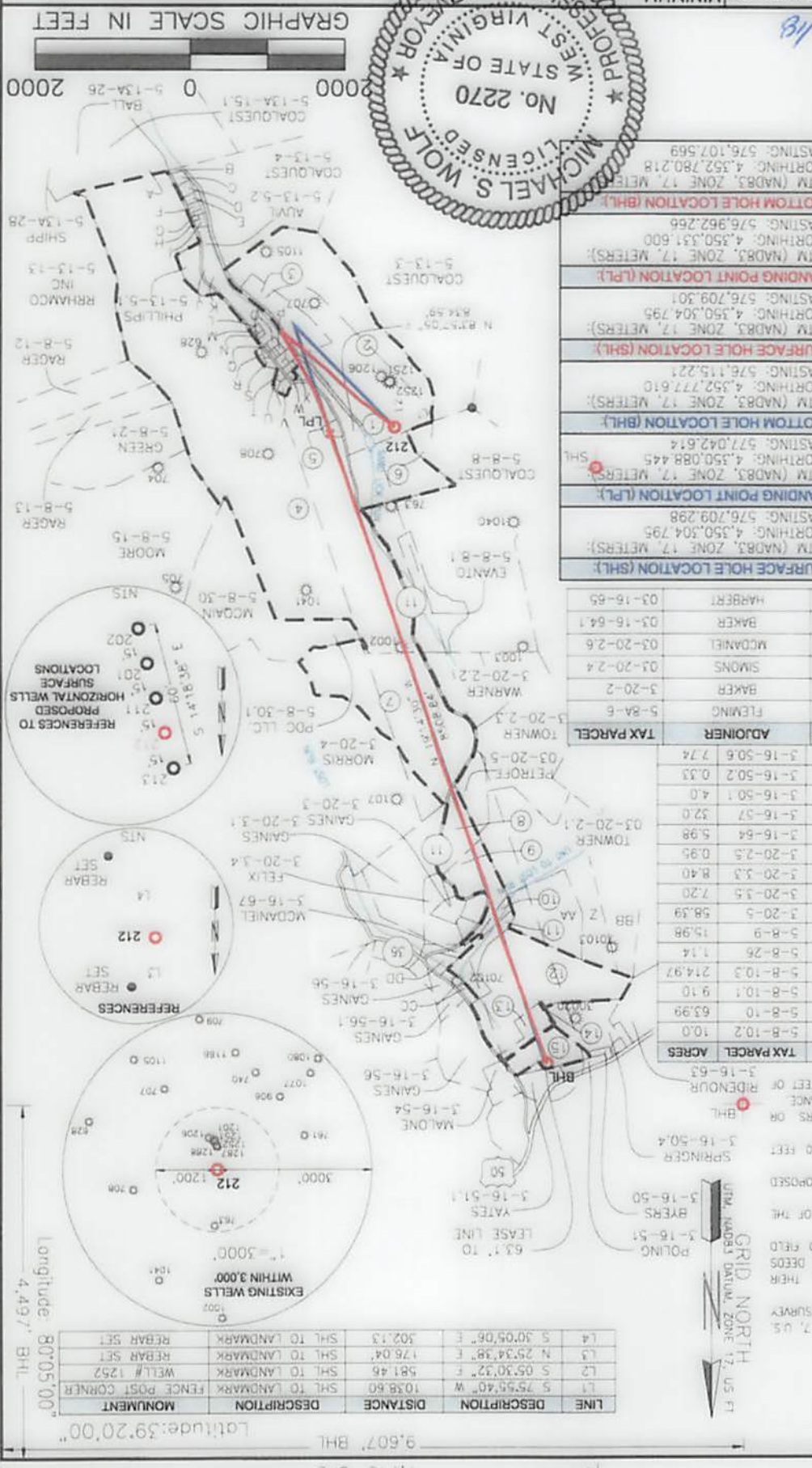
07/20/2018

| TRACT | SURFACE OWNER                 | TAX PARCEL ACRES |
|-------|-------------------------------|------------------|
| 1     | COALQUEST DEVELOPMENT LLC     | 10.0             |
| 2     | COALQUEST DEVELOPMENT LLC     | 63.99            |
| 3     | COALQUEST DEVELOPMENT LLC     | 9.10             |
| 4     | RICHTLID                      | 214.97           |
| 5     | COALQUEST DEVELOPMENT LLC     | 1.14             |
| 6     | COALQUEST DEVELOPMENT LLC     | 15.98            |
| 7     | MELINDA L PETROFF             | 58.39            |
| 8     | HOWARD AND KATRINA GAINES     | 7.20             |
| 9     | VIVIAN & ROBERT W SICKLES     | 8.40             |
| 10    | MILFORD P & BARBARA MCDANIEL  | 0.95             |
| 11    | MILFORD P & BARBARA MCDANIEL  | 5.98             |
| 12    | WILLIAM T & REBECCA L JENKINS | 32.0             |
| 13    | PALU R & WILLIAM DAVIS        | 4.0              |
| 14    | M & MEROPERT OPERATIONS       | 0.33             |
| 15    | JAY S SPINER & MARY M GERBA   | 7.74             |

| TRACT | ADJOINER | TAX PARCEL TRACT | ADJOINER | TAX PARCEL |
|-------|----------|------------------|----------|------------|
| A     | GERARD   | 5-15-13          | V        | 5-8A-6     |
| B     | FLOWER   | 5-13-10          | Z        | 3-20-2     |
| C     | FWLER    | 5-13-10          | AA       | 03-20-24   |
| D     | BARTLETT | 5-13-9           | BB       | 03-20-26   |
| E     | COOK     | 5-13-7           | CC       | 03-16-64.1 |
| F     | ZBOSNIK  | 5-13-7.2         | DD       | 03-16-65   |

| POINT | UTM (NAD83, ZONE 17, METERS) | NORTHING      | EASTING     |
|-------|------------------------------|---------------|-------------|
| H     | SURFACE HOLE LOCATION (SHL)  | 4,350,304.795 | 576,709.298 |
| I     | LANDING POINT LOCATION (LPL) | 4,350,304.795 | 576,709.298 |
| J     | BANKING & TRUST              | 5-13-5.4      | 5-8-11.2    |
| K     | FELTON                       | 5-8-11.2      | 5-8-11.7    |
| L     | POLING                       | 5-8-11.7      | 5-8-11.7    |
| M     | POLING                       | 5-8-11.7      | 5-8-11.7    |
| N     | POLING                       | 5-8-11        | 5-8-11      |
| O     | POLING                       | 5-8-11        | 5-8-11      |
| P     | FLEMING                      | 5-8A-10       | 5-8A-10     |
| Q     | FLEMING                      | 5-8A-10       | 5-8A-10     |
| R     | KETTERMAN                    | 5-8A-14       | 5-8A-14     |
| S     | KETTERMAN                    | 5-8A-7        | 5-8A-7      |
| T     | LIPSCOMB                     | 5-8A-4        | 5-8A-4      |
| U     | LIPSCOMB                     | 5-8A-3        | 5-8A-3      |
| V     | CAMPBELL                     | 5-8A-2        | 5-8A-2      |
| W     | GREEN                        | 5-8A-1        | 5-8A-1      |
| X     | ROSS                         | 5-8A-5        | 5-8A-5      |

I, THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAN 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



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS  
WDEP OFFICE OF OIL & GAS  
601 57TH STREET  
CHARLESTON, WV 25304  
PROVEN SURVEY SOURCE OF GRADE GPS  
ELEVATION: (NAVD 88, US FT)  
APL WELL #: 47  
STATE: WV  
COUNTY: TAYLOR

WELL TYPE: OIL  
WASTE DISPOSAL  
PRODUCTION  
DEEP  
GAS  
LIQUID INJECTION  
STORAGE  
SHALLOW  
WATERSHED: SAND LICK RUN OF SIMPSON CREEK  
DISTRICT: COURTHOUSE  
SURFACE OWNER: COALQUEST DEVELOPMENT LLC  
OIL & GAS ROYALTY OWNER: PATRIOT MINING, INC.  
DRILL DEEPER  
REDRILL  
FRACTURE OR STIMULATE  
PLUG OFF OLD FORMATION  
PERFORATE NEW FORMATION  
CONVERT  
PLUG & ABANDON  
CLEAN OUT & REPLUG  
OTHER CHANGE (SPECIFY) AS-DRIILLED  
TARGET FORMATION: MARCELLUS  
DESIGNATED AGENT: WILLIAM VEIGEL  
ADDRESS: 6031 WALLACE ROAD EXTENSION #300  
CITY: WEXFORD  
STATE: PA  
ZIP CODE: 15090

REVISIONS:  
DATE: 01-12-2018  
DRAWN BY: K. POIH  
SCALE: 1" = 2000'  
DRAWING NO: 030-304Z  
WELL LOCATION PLAN

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SCALE: 1" = 2000'  
DRAWN BY: K. POIH  
DATE: 01-12-2018

LEGEND:  
AS-DRIILLED SURFACE HOLE / BOTTOM HOLE  
EXISTING / PRODUCING WELLS  
LANDING POINT LOCATION  
EXISTING WATER WELL  
EXISTING SPRING  
500' BUFFER  
PROPOSED PATH  
AS-DRIILLED  
LEASE BOUNDARY  
DRILLING UNIT  
SURVEYED BOUNDARY