



west virginia department of environmental protection

Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304
(304) 926-0450
(304) 926-0452 fax

Earl Ray Tomblin, Governor
Randy C. Huffman, Cabinet Secretary
www.dep.wv.gov

October 14, 2014

WELL WORK PERMIT

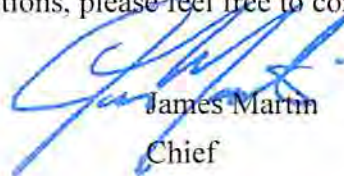
Horizontal 6A Well

This permit, API Well Number: 47-6900182, issued to CHESAPEAKE APPALACHIA, L.L.C., is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as amended, and all rules and regulations promulgated thereunder, and to all conditions and provisions outlined in the pages attached hereto. Notification shall be given by the operator to the Oil and Gas Inspector at least 24 hours prior to the construction of roads, locations, and/or pits for any permitted work. In addition, the well operator shall notify the same inspector 24 hours before any actual well work is commenced and prior to running and cementing casing. Spills or emergency discharges must be promptly reported by the operator to 1-800-642-3074 and to the Oil and Gas inspector.

Please be advised that form WR-35, Well Operators Report of Well Work is to be submitted to this office within 90 days completion of permitted well work, as should form WR-34 Discharge Monitoring Report within 30 days of discharge of pits, if applicable. Failure to abide by all statutory and regulatory provisions governing all duties and operations hereunder may result in suspension or revocation of this permit and, in addition, may result in civil and/or criminal penalties being imposed upon the operators.

In addition to the applicable requirements of this permit, and the statutes and rules governing oil and gas activity in WV, this permit may contain specific conditions which must be followed. Permit conditions are attached to this cover letter.

Per 35CSR-4-5.2.g this permit will expire in two (2) years from the issue date unless permitted well work is commenced. If there are any questions, please feel free to contact me at (304) 926-0499 ext. 1654.



James Martin
Chief

Operator's Well No: RAYLE COAL OHI 1H
Farm Name: SHORT CREEK COAL CO C/O RA
API Well Number: 47-6900182
Permit Type: Horizontal 6A Well
Date Issued: 10/14/2014

PERMIT CONDITIONS

West Virginia Code § 22-6A-8(d) allows the Office of Oil and Gas to place specific conditions upon this permit. Permit conditions have the same effect as law. Failure to adhere to the specified permit conditions may result in enforcement action.

CONDITIONS

1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACE). Through this permit, you are hereby being advised to consult with USACE regarding this proposed activity.
2. If the operator encounters an unanticipated void, or an anticipated void at an unanticipated depth, the operator shall notify the inspector within 24 hours. Modifications to the casing program may be necessary to comply with W. Va. Code § 22-6A-5a (12), which requires drilling to a minimum depth of thirty feet below the bottom of the void, and installing a minimum of twenty (20) feet of casing. Under no circumstance should the operator drill more than fifty (50) feet below the bottom of the void or install less than twenty (20) feet of casing below the bottom of the void.
3. When compacting fills, each lift before compaction shall not be more than 12 inches in height, and the moisture content of the fill material shall be within limits as determined by the Standard Proctor Density test of the actual soils used in specific engineered fill, ASTM D698, Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort, to achieve 95 % compaction of the optimum density. Each lift shall be tested for compaction, with a minimum of two tests per lift per acre of fill. All test results shall be maintained on site and available for review.
4. Operator shall install signage per § 22-6A-8g (6) (B) at all source water locations included in their approved water management plan within 24 hours of water management plan activation.
5. Oil and gas water supply wells will be registered with the Office of Oil and Gas and all such wells will be constructed and plugged in accordance with the standards of the Bureau for Public Health set forth in its Legislative rule entitled *Water Well Regulations*, 64 C.S.R. 19. Operator is to contact the Bureau of Public Health regarding permit requirements. In lieu of plugging, the operator may transfer the well to the surface owner upon agreement of the parties. All drinking water wells within fifteen hundred feet of the water supply well shall be flow tested by the operator upon request of the drinking well owner prior to operating the water supply well.
6. Pursuant to the requirements pertaining to the sampling of domestic water supply wells/springs the operator shall, no later than thirty (30) days after receipt of analytical data provide a written copy to the Chief and any of the users who may have requested such analyses.
7. If any explosion or other accident causing loss of life or serious personal injury occurs in or about a well or well work on a well, the well operator or its contractor shall give notice, stating the particulars of the explosion or accident, to the oil and gas inspector and the Chief, within 24 hours of said accident.
8. During the casing and cementing process, in the event cement does not return to the surface, the oil and gas inspector shall be notified within 24 hours.
9. Operator shall provide the Office of Oil & Gas notification of the date that drilling commenced on this well. Such notice shall be provided by sending an email to DEPOOGNotify@wv.gov within 30 days of commencement of drilling.

WW-6B
(9/13)

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS
WELL WORK PERMIT APPLICATION

1) Well Operator: Chesapeake Appalachia, LLC 49447757 69-Ohio Richland Tiltonsville
Operator ID County District Quadrangle

2) Operator's Well Number: Rayle Coal OHI 1H Well Pad Name: Rayle Coal Pad

3) Farm Name/Surface Owner: Short Creek Coal Co. % Rayle Coal Public Road Access: Huff Run Road

4) Elevation, current ground: 1065.5' Elevation, proposed post-construction: 1065.5'

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Target formation- Marcellus Target top TVD-5780' Target base TVD- 5838' Anticipated thickness-58' Associated Pressure- 3700

8) Proposed Total Vertical Depth: 5810'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 12,500'

11) Proposed Horizontal Leg Length: 6072'

12) Approximate Fresh Water Strata Depths: 255'

13) Method to Determine Fresh Water Depths: from log analysis and nearby water wells

14) Approximate Saltwater Depths: 438'

15) Approximate Coal Seam Depths: 248'

16) Approximate Depth to Possible Void (coal mine, karst, other): 248' abandoned mine

17) Does Proposed well location contain coal seams directly overlying or adjacent to an active mine? Yes No

(a) If Yes, provide Mine Info: Name: _____
Depth: _____
Seam: _____
Owner: _____

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WRH
7-25-14

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WV Dept. of Environmental Protection

18)

CASING AND TUBING PROGRAM

| <u>TYPE</u> | <u>Size</u> | <u>New or Used</u> | <u>Grade</u> | <u>Weight per ft. (lb/ft)</u> | <u>FOOTAGE: For Drilling</u> | <u>INTERVALS: Left in Well</u> | <u>CEMENT: Fill-up (Cu. Ft.)</u> |
|--------------|-------------|--------------------|--------------|-------------------------------|------------------------------|--------------------------------|---------------------------------------|
| Conductor | 20" | New | J-55 | 94# | 100' | 100' | CTS |
| Fresh Water | 13 3/8" | New | J-55 | 54.5# | 350' | 350' | 340 sx/CTS |
| Coal | 9 5/8" | New | J-55 | 40# | 1698' | 1698' | 650 sx/CTS |
| Intermediate | 7" | New | P-110 | 20# | If Needed | If Needed | If Needed/As Needed |
| Production | 5 1/2" | New | P-110 | 20# | 12,500 | 12,500' | 1150 Lead or 1020 Tail or 100' Packer |
| Tubing | 2 3/8" | New | N-80 | 4.7# | Approx. 6737' | Approx. 6737' | |
| Liners | | | | | | | |

WRN
7-25-14

| <u>TYPE</u> | <u>Size</u> | <u>Wellbore Diameter</u> | <u>Wall Thickness</u> | <u>Burst Pressure</u> | <u>Cement Type</u> | <u>Cement Yield (cu. ft./k)</u> |
|--------------|-------------|--------------------------|-----------------------|-----------------------|--------------------|---------------------------------|
| Conductor | 20" | 30" | 0.25 | 2120 | Class A | 1.19/50% Excess |
| Fresh Water | 13 3/8" | 17.5" | 0.380 | 2740 | Class A | 1.19/50% Excess |
| Coal | 9 5/8" | 12 1/4" | 0.395 | 3950 | Class A | 1.19/50% Excess |
| Intermediate | 7" | 8 3/4" | 0.317 | 4360 | Class A | 1.20/15% Excess |
| Production | 5 1/2" | 8 3/4" | 0.361 | 12360 | Class A | 1.20/15% Excess |
| Tubing | 2 3/8" | 4.778" | 0.190 | | | |
| Liners | | | | | | |

PACKERS

| | | | | |
|-------------|--------------------|--|--|--|
| Kind: | 10K Arrowset AS1-X | | | |
| Sizes: | 5 1/2" | | | |
| Depths Set: | | | | |

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19) Describe proposed well work, including the drilling and plugging back of any pilot hole:

Drill and stimulate any potential zones between and including the Benson to the Marcellus. **If we should encounter a void, place basket above and below void area - balance cement to bottom of void and grout from basket to surface. Run casing not less than 20' below void nor more than 50' below void. (*If freshwater is encountered deeper than anticipated it must be protected, set casing 50' below and cts)

20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:

Well will be perforated within the target formation and stimulated with a slurry of water, sand, and chemical additives at a high rate. This will be performed in stages with the plug and perf method along the wellbore until the entire lateral has been stimulated within the target formation. All stage plugs are then drilled out and the well is flowed back to surface. The well is produced through surface facilities consisting of high pressure production units, vertical separation units, water and oil storage tanks. Max press and anticipated max rate-9000 lbs @ 80 barrells a minute.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 16.3

22) Area to be disturbed for well pad only, less access road (acres): 10.9

23) Describe centralizer placement for each casing string:

All casing strings will be ran with a centralizer at a minimum of 1 per every 3 joints of casing.

24) Describe all cement additives associated with each cement type:

See Attachment**

25) Proposed borehole conditioning procedures:

All boreholes will be conditioned with circulation and rotation for a minimum of one bottoms up and continuing until operator is satisfied with borehole conditions.

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WV Dept. of Environmental Protection

*Note: Attach additional sheets as needed.

4706900182

SLB Cement Additives

| | Product Name | Product Use | Chemical Name | CAS Number | % Concentration Used |
|---------------|-------------------|-------------------|---------------------|-------------|----------------------|
| Surface | D046 | antifoam | Fuller's earth | 8031-18-3 | 0.2% BWOC |
| | | | Polypropylene | 25322-69-4 | |
| | D130 | polyester flake - | polyethylene | 25038-59-9 | 0.125 lb/sk |
| | S001 | calcium chloride | calcium chloride | 10043-52-4 | 2% BWOC |
| | | | | | |
| | SPACER | | | | |
| Intermediate | D046 | antifoam | Fuller's earth | 8031-18-3 | 0.2% BWOC |
| | | | Polypropylene | 25322-69-4 | |
| | D130 | polyester flake - | polyethylene | 25038-59-9 | 0.125 lb/sk |
| | D044 | granulated salt | sodium chloride | 7647-14-5 | 10% BWOW |
| | D153 | Anti-Settling | chrystalline silica | 14808-60-7 | 0.15% BWOC |
| | | | | | |
| | SPACER | | | | |
| | D020 | bentonite | bentonite | 1302-78-9 | 20 lb/bbl |
| D130 | polyester flake - | polyethylene | 25038-59-9 | 1 lb/bbl | |
| Kick Off Plug | D080 | cement liquid | product | | 0.05 gal/sk |
| | D801 | mid-temp | product | | 0.01 gal/sk |
| | D047 | antifoam agent | polypropylene | 25322-69-4 | 0.02 gal/sk |
| | | | | | |
| | SPACER | | | | |
| | B389 | MODFOAM | Carbohydrate | proprietary | 1 lb/bbl |
| | D206 | antifoaming Agent | Silica Organic | proprietary | 0.1 gal/bbl |
| | D031 | barite | barium sulfate | 7727-43-7 | 310 lb/bbl |
| | B220 | surfactant | fatty acid amine | proprietary | |
| | | | ethoxylated | proprietary | |
| glycerol | | | 56-81-5 | | |
| | | 2.2'- | 111-42-2 | 1 gal/bbl | |
| D167 | UNIFLAC* S | aliphatic amide | proprietary | 0.35% BWOC | |

***Ref: 12013-78

Production

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| | | | | | |
|-------------------|-----------------------|----------------------------------|---------------------|-------------|-----------|
| Production - Lead | D154 | low-temperature | non-crystalline | 7631-86-9 | 6% BWOC |
| | D400 | EasyBLOK | boric acid | 10043-35-3 | 0.8% BWOC |
| | D046 | antifoam | Fuller's earth | 8031-18-3 | |
| | | | Polypropylene | 25322-69-4 | 0.2% BWOC |
| | D201 | basic cements enabler | chrystalline silica | 14808-60-7 | |
| | | | metal oxide | proprietary | 0.2% BWOC |
| | D202 | low-temperature solid dispersant | sulphonated | proprietary | |
| | | | formaldehyde | 50-00-0 | 0.3% BWOC |
| | D046 | antifoam | Fuller's earth | 8031-18-3 | |
| | | | Polypropylene | 25322-69-4 | 0.2% BWOC |
| D167 | UNIFLAC* S | aliphatic amide | proprietary | 0.35% BWOC | |
| D065 | TIC* Dispersant | Sodium | 9008-63-3 | | |
| | | Sodium Sulfate | 7757-82-6 | 0.25% BWOC | |
| D201 | basic cements enabler | chrystalline silica | 14808-60-7 | | |
| | | metal oxide | proprietary | 0.2% BWOC | |
| D153 | Anti-Settling | chrystalline silica | 14808-60-7 | 0.2% BWOC | |
| SPACER | | | | | |
| B389 | MODUSIN | Carbohydrate | proprietary | proprietary | |
| D206 | Foamforming Agent | Silica Organic | proprietary | proprietary | |
| D031 | barite | barium sulfate | 7727-43-7 | 7727-43-7 | |
| B220 | surfactant | fatty acid amine | proprietary | proprietary | |
| | | ethoxylated | proprietary | proprietary | |
| | | glycerol | 56-81-5 | 56-81-5 | |
| | | 2.2'- | 111-42-2 | 111-42-2 | |

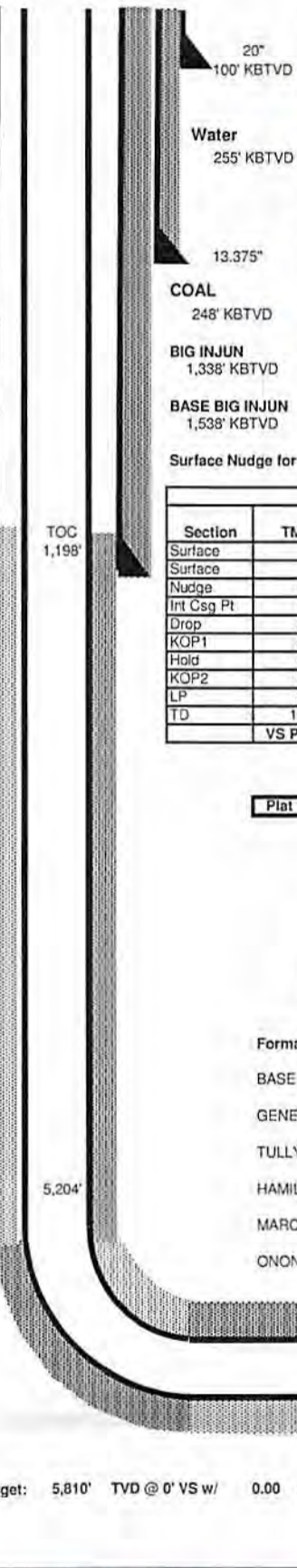
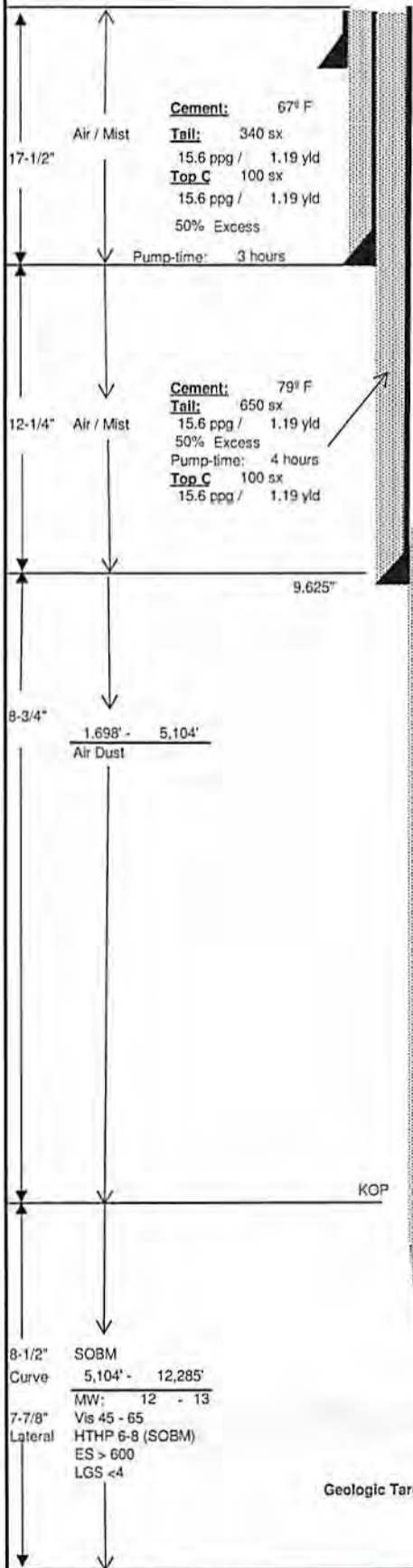
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 WV Dept. of Environmental Protection

4706900182

| | | | |
|-------------------------------|--------------------------------------|-------------------------------------|--------------------------|
| | | Well Name: Rayle Coal OHI 1H | Drilling Rig: N/A |
| Drilling Engineer: TBD | Formation: Marcellus | Directional Drilling: N/A | |
| Superintendent: N/A | County, State: Ohio, WV | Drilling Mud: N/A | |
| Asset Manager: N/A | Surface Latitude: 40.161338 | Cement Surface: N/A | |
| Geologist: N/A | Surface Longitude: -80.627034 | Cement Longstrings: N/A | |
| Land: N/A | BH Latitude: 40.17535 | Wellhead: N/A | |
| | BH Longitude: -80.63713 | AFE #: N/A | |
| | KB Elevation: 1088' | | |
| | Ground Elevation: 1066' | | |



| Wellhead Equipment | |
|--------------------|------------------------|
| Tree Description | |
| Tubing Head ** | Blanking Cap |
| 'B' Section | 11" x 5M x 7-1/16" 10M |
| 'A' Section | 9-5/8" SOW x 11" 5M |

** Space out such that Blanking Cap is no more than 30" above grade.

| Casing Detail | | | | | |
|---------------|--------|--------|-------|-------|------------|
| | Size | Wt | Grd | Conn. | From: To: |
| Surface | 13.375 | 54.5 # | J-55 | STC | 0' 350' |
| Interm | 9.625 | 40 # | J-55 | LTC | 0' 1,698' |
| Prod | 5.5 | 20 # | P-110 | GBCD | 0' 12,285' |

Report any water or gas flows. Catch liquid sample if possible.

| Casing Design | | | | | | |
|---------------|--------|--------|-------|-------|------|---------|
| | Size | ID | Coll | Burst | Tens | MU torq |
| Surface | 13.375 | 12.615 | 1130 | 2740 | 514 | 5140 |
| Interm | 9.625 | 8.835 | 2570 | 3950 | 520 | 5200 |
| Prod | 5.5 | 4.778 | 12200 | 12360 | 641 | 8530 |

Surface Nudge for Anti-Collision purposes.

| Directional Drilling Details | | | | | | | | |
|------------------------------|---------------|-------|---------|--------|-------|-------|------------------|------------------|
| Section | TMD | Inc. | Azimuth | TVD | BUR | DLS | +N/-S | +E/-W |
| Surface | 0.00' | 0.00 | 0.00 | 0.00' | 0.00 | 0.00 | 0.0' | 0.0' |
| Surface | 995' | 0.00 | 0.00 | 995' | 0.00 | 0.00 | 0.0' | 0.0' |
| Nudge | 1,395' | 12.00 | 270.00 | 1,392' | 3.00 | 3.00 | 0.0' | -41.7' |
| Int Csg Pt | 1,698' | 12.00 | 270.00 | 1,688' | 0.00 | 0.00 | 0.0' | -104.6' |
| Drop | 2,298' | 0.00 | 0.00 | 2,284' | -2.00 | 2.00 | 0.0' | -167.2' |
| KOP1 | 5,204' | 0.00 | 0.00 | 5,190' | 0.00 | 0.00 | 0.0' | -167.2' |
| Hold | 6,038' | 83.44 | 269.73 | 5,759' | 10.00 | 10.00 | -2.4' | -674.7' |
| KOP2 | 6,132' | 83.44 | 269.73 | 5,770' | 0.00 | 0.00 | -2.8' | -767.3' |
| LP | 6,737' | 90.00 | 342.31 | 5,810' | 1.08 | 12.00 | 330.3' | -1,223.1' |
| TD | 12,285' | 90.00 | 342.31 | 5,810' | 0.00 | 0.00 | 5,615.6' | -2,908.9' |
| VS Plane | 342.31 | | | | | | VS Length | 6,234.02' |

Lateral Length ==> 6,153.50'

Plat Date 7/24/14

| Logging Program | | |
|-----------------|----------|----------|
| Run | Log Type | Interval |
| 1 | TBD | TBD |
| 2 | TBD | TBD |

Mudlogger operational at Surface

Formation Depths (TVD)

| | |
|----------------|--------|
| BASE BIG INJUN | 1,538' |
| GENESEO | 5,636' |
| TULLY | 5,656' |
| HAMILTON | 5,703' |
| MARCELLUS | 5,780' |
| ONONDAGA | 5,838' |

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Geologic Target: 5,810' TVD @ 0' VS w/ 0.00 degrees/100 ft Up-dip

PBHL 5.5"
 TMD: 12,285'
 TVD: 5,810'
 Inclination: 90.00 deg

10/17/2014

**Gyro the 1st well on the pad at KOP.
 Ensure all Surveys are referenced to Grid North!!**

Drawn by: **TBD**
 Date: **7/24/2014**

WW-9
(9/13)

API Number 47 - 69-Ohio -
Operator's Well No. Rayle Coal OHI 1H

STATE OF WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL AND GAS

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Chesapeake Appalachia, LLC OP Code 49447757

Watershed (HUC 10) Short Creek-Ohio River Quadrangle Tiltonsville

Elevation 1065.5' County 69-Ohio District Richland

Do you anticipate using more than 5,000 bbls of water to complete the proposed well work? Yes No

Will a pit be used? Yes No

If so, please describe anticipated pit waste: Closed loop system in place at this time- cuttings will be taken to a permitted landfill.

Will a synthetic liner be used in the pit? Yes No If so, what ml.? _____

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number 2D0072539/ 2D0413175/ 2D0610306/ 2D0610317)
- Reuse (at API Number at next anticipated well, API# will be included with the WR-34/DDMR &/or permit addendum.)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Flow back fluids will be put in steel tanks and reused or taken to a permitted disposal facility.)

Will closed loop system be used? If so, describe: Yes

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Air and salt saturate mud

-If oil based, what type? Synthetic, petroleum, etc. Synthetic Oil Base

Additives to be used in drilling medium? see attached sheets

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Landfill

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) _____

-Landfill or offsite name/permit number? Meadowfill SWF-1032, SS Grading SWF-4002, Northwestern SWF-1025, Short Creek 1034/WV0109517/CID28726, Carbon Limestone 28726/CID 28726
Arden Landfill 10072, American 02-12954, Country Wide 38390/CID 38390, Pine Grove 13688

I certify that I understand and agree to the terms and conditions of the GENERAL WATER POLLUTION PERMIT issued on August 1, 2005, by the Office of Oil and Gas of the West Virginia Department of Environmental Protection. I understand that the provisions of the permit are enforceable by law. Violations of any term or condition of the general permit and/or other applicable law or regulation can lead to enforcement action.

I certify under penalty of law that I have personally examined and am familiar with the information submitted on this application form and all attachments thereto 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 or imprisonment.

Company Official Signature [Signature]

Company Official (Typed Name) Dee Southall AUG 4 2014

Company Official Title Regulatory Analyst II

Subscribed and sworn before me this 31st day of July, 20 14

My commission expires 11/27/22

Office of Oil and Gas
WV Dept. of Environmental Protection



Form WW-9

Operator's Well No. Rayle Coal OHI 1H

Chesapeake Appalachia, LLC

Proposed Revegetation Treatment: Acres Disturbed 10+/- Prevegetation pH _____

Lime as determined by pH test min. 2 _____ Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 600 lbs/acre

Mulch Hay/Straw 2.5 Tons/acre

Seed Mixtures

| Temporary | | Permanent | |
|---------------|----------|---------------|----------|
| Seed Type | lbs/acre | Seed Type | lbs/acre |
| White Clover | 15 | White Clover | 15 |
| Red Top | 15 | Red Top | 15 |
| Orchard Grass | 20 | Orchard Grass | 20 |

Attach:

Drawing(s) of road, location, pit and proposed area for land application (unless engineered plans including this info have been provided)

Photocopied section of involved 7.5' topographic sheet.

Plan Approved by: *Bill Harkness*

Comments: _____

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Title: Oil and Gas Inspector

Date: 7-25-14

Field Reviewed? Yes No

Office of Oil and Gas
WV Dept. of Environmental Protection

4706900182

**Marcellus Well Drilling Procedures
And Site Safety Plan**

Chesapeake Appalachia, LLC

47 - 069 -
Well name: Rayle Coal OHI 1H
Valley Grove, Quad
Liberty, District
Ohio County, West Virginia

*WRH
7-25-14*

Submitted by:  Date: 7/17/2014
Danielle Southall

Title Regulatory Analyst II Chesapeake Appalachia, LLC

Approved by: _____ Date: _____

Title: _____

Approved by: _____ Date: _____

Title: _____

Chesapeake Appalachia, L.L.C. – Confidential

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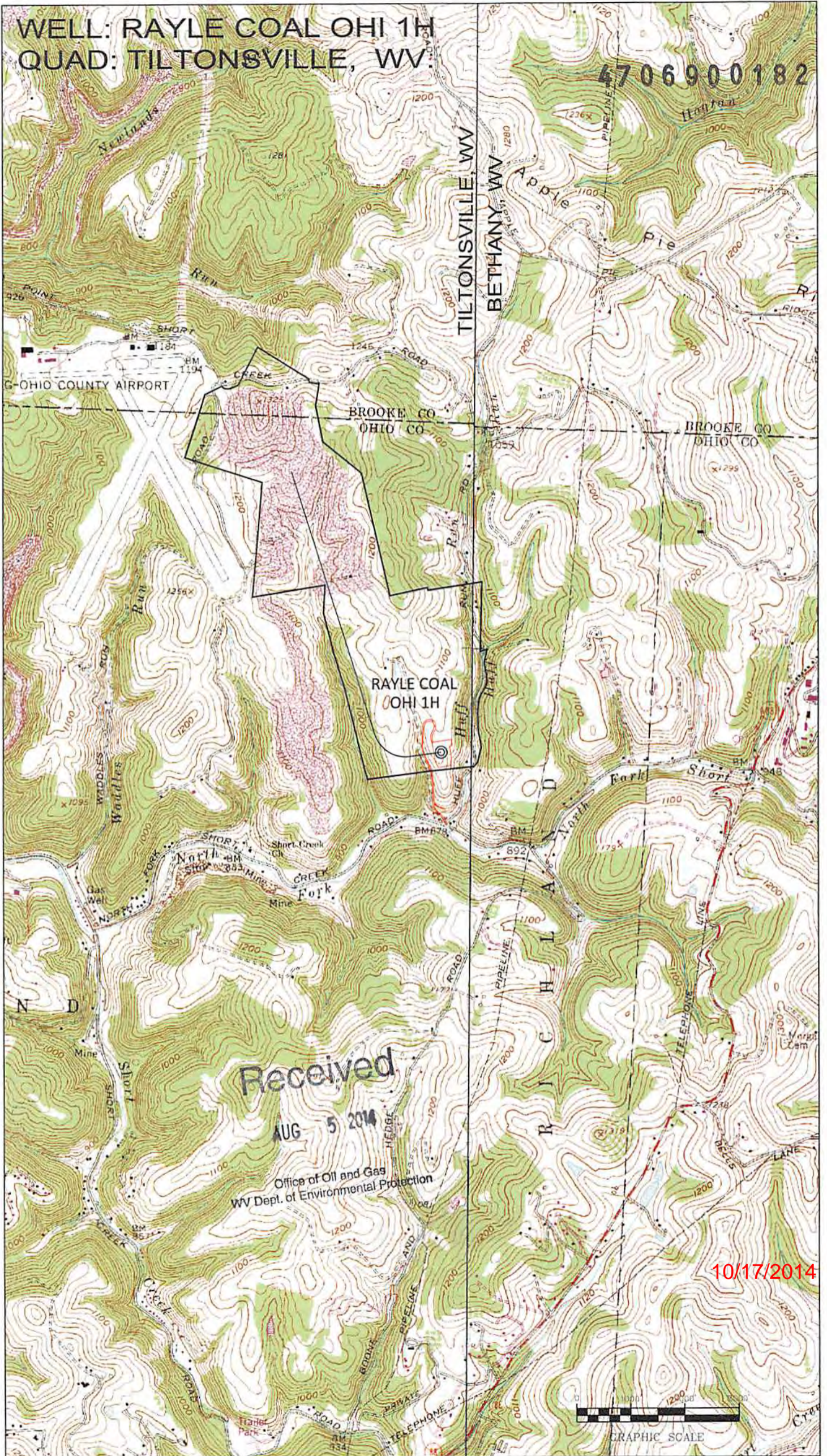
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Office of Oil and Gas
WV Dept. of Environmental Protection

10/17/2014

WELL: RAYLE COAL OHI 1H
QUAD: TILTONSVILLE, WV.

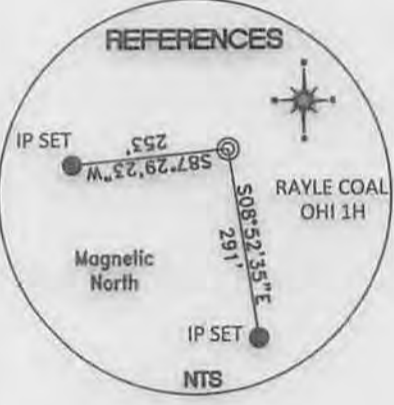
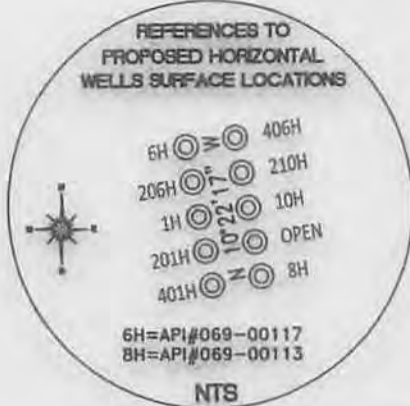
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10/17/2014





| | |
|--------------------------|-----------|
| TH (U/M-NAD 83) | |
| N) | 4445739.1 |
| E) | 531778.4 |
| BOTTOM HOLE (U/M-NAD 83) | |
| N) | 4447290.8 |
| E) | 530912.3 |

REFERENCE NOTES
 Boundaries as shown taken from deeds, tax maps and field locations. A full boundary survey is not expressed nor implied. All bearings are based on true north. Ownership taken from public records Ohio County, West Virginia JUNE 2014
 State Plane Coordinates & NAD 83 Lat/Long by differential submeter mapping grade GPS
 Drafted by: E.A.M.

FILE #: CHE 122
 DRAWING #: 2374
 SCALE: PLAT - 1"=1200'
 TICK MARK - 1"=2000'
 MINIMUM DEGREE OF ACCURACY: 1/200
 PROVEN SOURCE OF ELEVATION: SUBMETER MAPPING GRADE GPS

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 REGULATIONS ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

Signed: *[Signature]*
 L.L.S. #2124 : Ernest J. Benchek III



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS WYDEP
 OFFICE OF OIL & GAS
 601 57TH STREET
 CHARLESTON, WV 25304

DATE: JULY 31, 2014
 OPERATOR'S WELL #: RAYLE COAL OHI 1H
 API WELL #: 47 69 00182.H0A
 STATE COUNTY PERMIT

Well Type: Oil Waste Disposal Production Deep
 Gas Liquid Injection Storage Shallow

WATERSHED: SHORT CREEK-OHIO RIVER
 COUNTY/DISTRICT: OHIO/RICHLAND
 SURFACE OWNER: SHORT CREEK COAL CO. C/O RAYLE COAL
 OIL & GAS ROYALTY OWNER: SHORT CREEK COAL CO. C/O RAYLE COAL
 LEASE NUMBERS: _____

ELEVATION: 1,065.5'
 QUADRANGLE: TILTONSVILLE WV.
 ACREAGE: 61.53 +/-
 ACREAGE: 394.05 +/- 10/17/2014

DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE
 PLUG OFF FORMATION PERFORATE NEW FORMATION PLUG & ABANDON
 CLEAN OUT & REPLUG OTHER CHANGE (SPECIFY): _____

TARGET FORMATION: MARCELLUS
 WELL OPERATOR: CHESAPEAKE OPERATING, INC.
 ADDRESS: PO BOX 18496
 CITY: OKLAHOMA CITY STATE: OK ZIP CODE: 73154-0496

ESTIMATED DEPTH: TVD: 5,810' TMD: 11,785'
 DESIGNATED AGENT: ERIC B. GILLESPIE
 ADDRESS: 414 SUMMER ST.
 CITY: CHARLESTON STATE: WV ZIP CODE: 25301