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**west virginia** department of environmental protection

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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

May 08, 2014

**WELL WORK PERMIT**

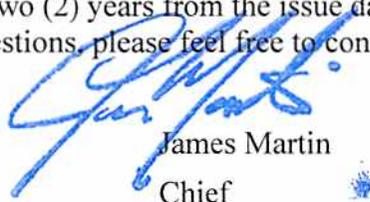
**Horizontal 6A Well**

This permit, API Well Number: 47-7700603, issued to ENERPLUS RESOURCES (USA) CORPORATION, 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: COLEBANK 1-7HG  
Farm Name: COLEBANK, FRANCIS E. & VER,  
**API Well Number: 47-7700603**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 05/08/2014

**Promoting a healthy environment.**

## 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.

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### CONDITIONS

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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](mailto:DEPOOGNotify@wv.gov) within 30 days of commencement of drilling.



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west virginia department of environmental protection

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Oil and Gas Conservation Commission  
601 57<sup>th</sup> Street, SE Charleston, WV 25304  
(304)926-0499, Ext 1656

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

March 13, 2014

Department of Environmental Protection  
Office of Oil and Gas  
Charleston, WV 25304

RE: Application for Deep Well Permit – API #47-077-00603

COMPANY: Enerplus Resources USA Corporation

FARM: Colebank #1-7HG

COUNTY: Preston DISTRICT: Reno QUAD: Fellowsville

The deep well review of the application for the above company is **APPROVED NEEDMORE – MARCELLUS COMPLETION**. If operator wishes to drill deeper than the POINT PLEASANT, additional approval must be obtained from the OGCC.

The applicant has complied with the provision of Chapter 22C-9, of the Code of West Virginia, nineteen hundred and thirty-one (1931), as amended, Oil and Gas Conservation Commission as follows:

1. Provided a certified copy of duly acknowledged and recorded consent and easement form from all surface owners; yes
2. Provided a tabulation of all deep wells within one mile of the proposed location, including the API number of all deep wells, well name, and the name and address of the operator; none
3. Provided a plat showing that the proposed location is a distance of 400+ feet from the nearest lease line or unit boundary and showing the following wells drilled to or capable of producing from the objective formation within 3,000 feet of the proposed location.

Sincerely,

Cindy Raines  
Executive Assistant

**To avoid enforcement action and per 39CSR1.4.6 and 4.10 filing of wells logs and directional surveys are due within 90 days of completion of a deep well.**

WW-6B  
(9/13)

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

77 06 347

1) Well Operator: Enerplus Resources (USA) Corp. 49449649 Preston Reno Fellowsville  
Operator ID County District Quadrangle

2) Operator's Well Number: Colebank 1-7HG Well Pad Name: Colebank

3) Farm Name/Surface Owner: Colebank Public Road Access: Sinclair Colebanks Road

4) Elevation, current ground: 1614.0' Elevation, proposed post-construction: 1614.0'

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, Depth: 8070 - 8175' TVD, Thickness: 105', Max Pressure: 4170psi *SDW 12/16/13*

8) Proposed Total Vertical Depth: 8,156.5' for lateral, 8,275' ft for pilot *12/16/13*

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 12,952'

11) Proposed Horizontal Leg Length: 4,795.5'

12) Approximate Fresh Water Strata Depths: 0 - 365 ft

13) Method to Determine Fresh Water Depths: Deepest wells and lowest springs in the area suggest <250ft

14) Approximate Saltwater Depths: \_\_\_\_\_

15) Approximate Coal Seam Depths: ~300 (UK) and ~450 (LK) based upon WVGES Datum

16) Approximate Depth to Possible Void (coal mine, karst, other): no known voids that underlie the proposed site ✓

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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(9/13)

18)

CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per ft. (lb/ft)	FOOTAGE: For Drilling	INTERVALS: Left in Well	CEMENT: Fill-up (Cu. Ft.)
Conductor	20"		K-55	-	40'	40'	
Fresh Water	13 3/8"		J-55	54.5 lb	<del>850</del> -465'	<del>850</del> -465'	Cement to surface
Coal							
Intermediate	9 5/8"		L-80	36 lb	2,500'	2,500'	Cement to surface
Production	5 1/2"		P-110	20 lb	12,952'	12,952'	Cement to 2000'
Tubing	2 3/8"		J-55	4.7 lb			
Liners	N/A						

MM 4/9/14

SDW  
12/16/13
  
12/16/13

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"		.438	2110	NA	NA
Fresh Water	13 3/8"	15.375	.380	2730	Type 1 +2%CG +1/4# Flats	1.27
Coal						
Intermediate	9 5/8"	11.625	.352	3520	Gas Block	1.29 ft3/sk
Production	5 1/2"	7.050	.361	12640	Type 1	1.37
Tubing						
Liners						

PACKERS

Kind:				
Sizes:				
Depths Set:				

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

Drill a Marcellus shale gas well into the 100 ft below the base of the Marcellus (Needmore Fm), plug back the vertical to specified depth and commence horizontal drilling into the Marcellus shale unit. The plug will be solid cement from the T.D. back up the hole to some point above the kickoff point. This point will be designated in the field at the time of drilling and plug back. Evaluate the well. Run and cement production casing. Demobilize the rig.

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

Mobilize completion equipment. Complete well: perforate, fracture, stimulate, clean out, run tubing, unload and test the gas well. Reclaim the site.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 15.65

22) Area to be disturbed for well pad only, less access road (acres): 3.07

23) Describe centralizer placement for each casing string:

1. Fresh Water Coal (13-3/8"): 1 per joint on bottom 3 jts., then every 3rd jt. to surface.
2. Intermediate (9-5/8"): 1 per joint on bottom 3 jts., then every 3rd jt. to surface.
3. Production (5-1/2"): Every joint f/ float shoe - top of curve, then every 4th jt to intermediate casing.

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

- ✓ 1. Fresh Water Coal (Surface): 2% bwoc Calcium Chloride + 0.25 lbs/sack Cello Flake
2. Intermediate: 2% bwoc Calcium Chloride + 0.3% bwoc CR-3 (retarder / dispersant)
3. Production: Lead slurry - 2% bwoc Bentonite + 0.5% bwoc CFL-117 (fluid loss) + 0.5% CR-3 (retarder) + 0.3% defoamer  
Tail slurry - 100% ASE-325 (solubility enhancer) + 3% bwoc bentonite + 0.75% CR-3 + 0.75% CFL-117

25) Proposed borehole conditioning procedures:

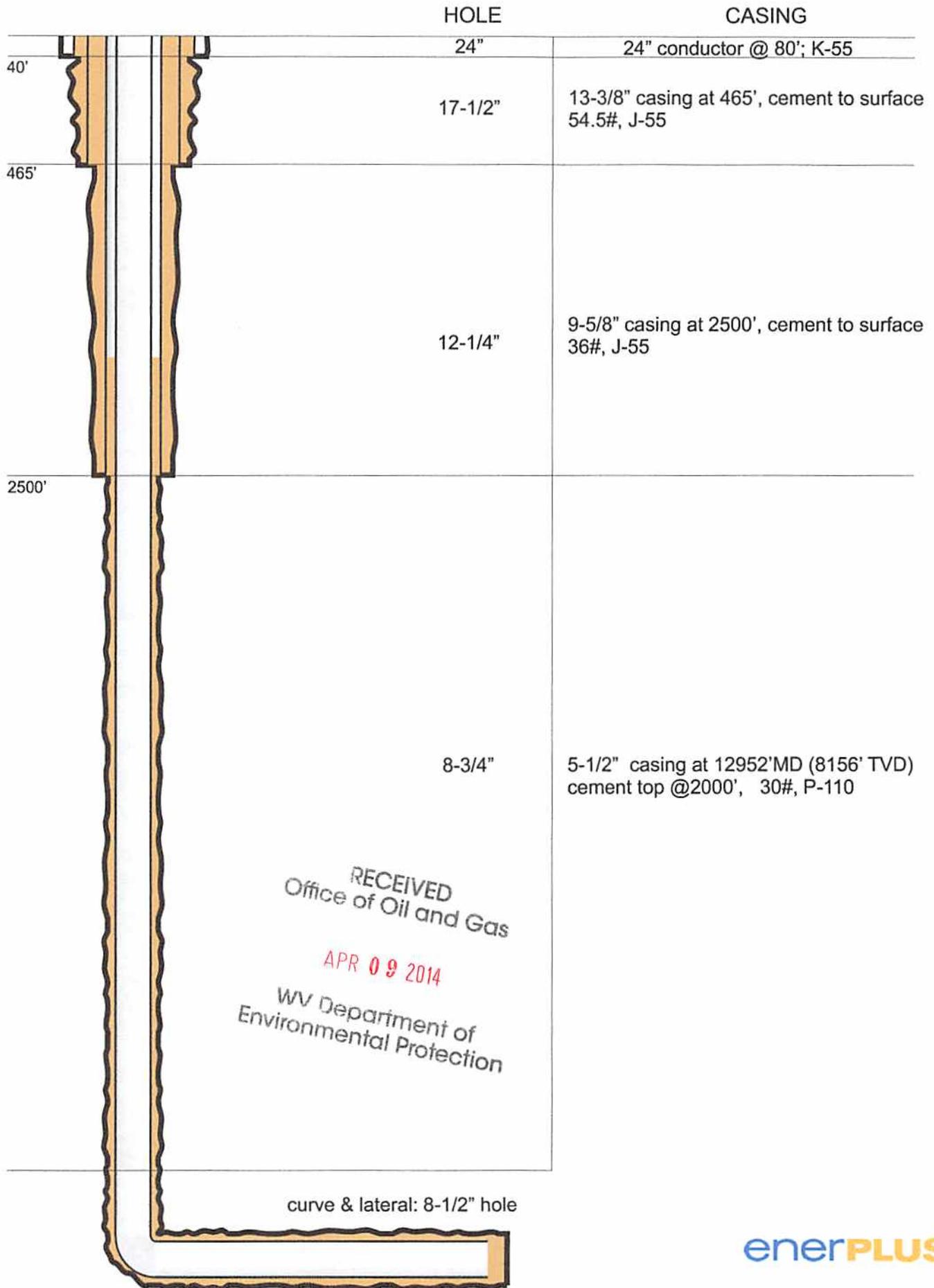
1. Surface: Circulate minimum of 2 bottoms-up with water to confirm full circulation and returns to surface prior to cementing.
2. Intermediate: Circulate minimum of 1.5 bottoms-up prior to logging to determine if hole is taking fluid. Prior to cementing, circulate min. 2 x hole volume at the max rate planned for during the cementing operation to ensure no lost circulation.
3. Production: At vertical TD, circulate at least 1 bottoms-up (or swap hole from air over to brine) in preparation for running wireline logs. At lateral TD, circulate min 2 x hole volume. Add LCM if necessary to heal losses during cementing.

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\*Note: Attach additional sheets as needed.

ENERPLUS Colebank 1-7H  
Casing plan

County: Preston Co., WV  
Prepared by: jpk  
Date: April 2014



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API Number 47 - 077 - 00586  
Operator's Well No. Colbanks 1-71G

STATE OF WEST VIRGINIA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
OFFICE OF OIL AND GAS  
FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Enerplus Resources (USA) Corporation OP Code 49449649

Watershed (HUC 10) Sandy Creek Quadrangle Fellowsville

Elevation 1614.0' County Preston District Reno

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: flowback fluids

Will a synthetic liner be used in the pit? Yes  No  If so, what ml.? 40 mil (As-built)

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number \_\_\_\_\_ )
- Reuse (at API Number next well on pad )
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

DV 4/9/14

Will closed loop system be used? If so, describe: For cuttings closed loop SDW 12/16/13

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

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

Additives to be used in drilling medium? see attached

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. removed offsite Closed loop SDW

-If left in pit and plan to solidify what medium will be used? (cement, lime, sawdust) not applicable

-Landfill or offsite name/permit number? WSI-Mosteller Landfill in Vintondale, Somerset County PA

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]

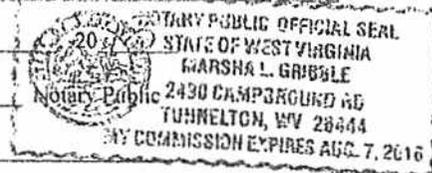
Company Official (Typed Name) Timothy Miller

Company Official Title Landman

Subscribed and sworn before me this 20 day of November

[Signature]

My commission expires August 7, 2016



Form WW-9

Operator's Well No. Colebanks 1-7HG

**Enerplus Resources (USA) Corporation**

Proposed Revegetation Treatment: Acres Disturbed 15.65 Prevegetation pH 6.5

Lime 6 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20 or equivalent

Fertilizer amount 500 lbs/acre

Mulch 2 to 3 Tons/acre

Seed Mixtures

Temporary		Permanent	
Seed Type	lbs/acre	Seed Type	lbs/acre
Tall fescue	40	Tall fescue	40
Annual rye	10	Annual rye	10
Ladino clover	5	Ladino clover	5
Birdsfoot trefoil	10	Birdsfoot trefoil	10

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.

See the attached Fellowsville, WV 7.5' USGS Topographic map.

Plan Approved by: \_\_\_\_\_

Comments: ~~SDW~~ SDW Existing location. Upgrade E+S as necessary per WV DEP E+S manual

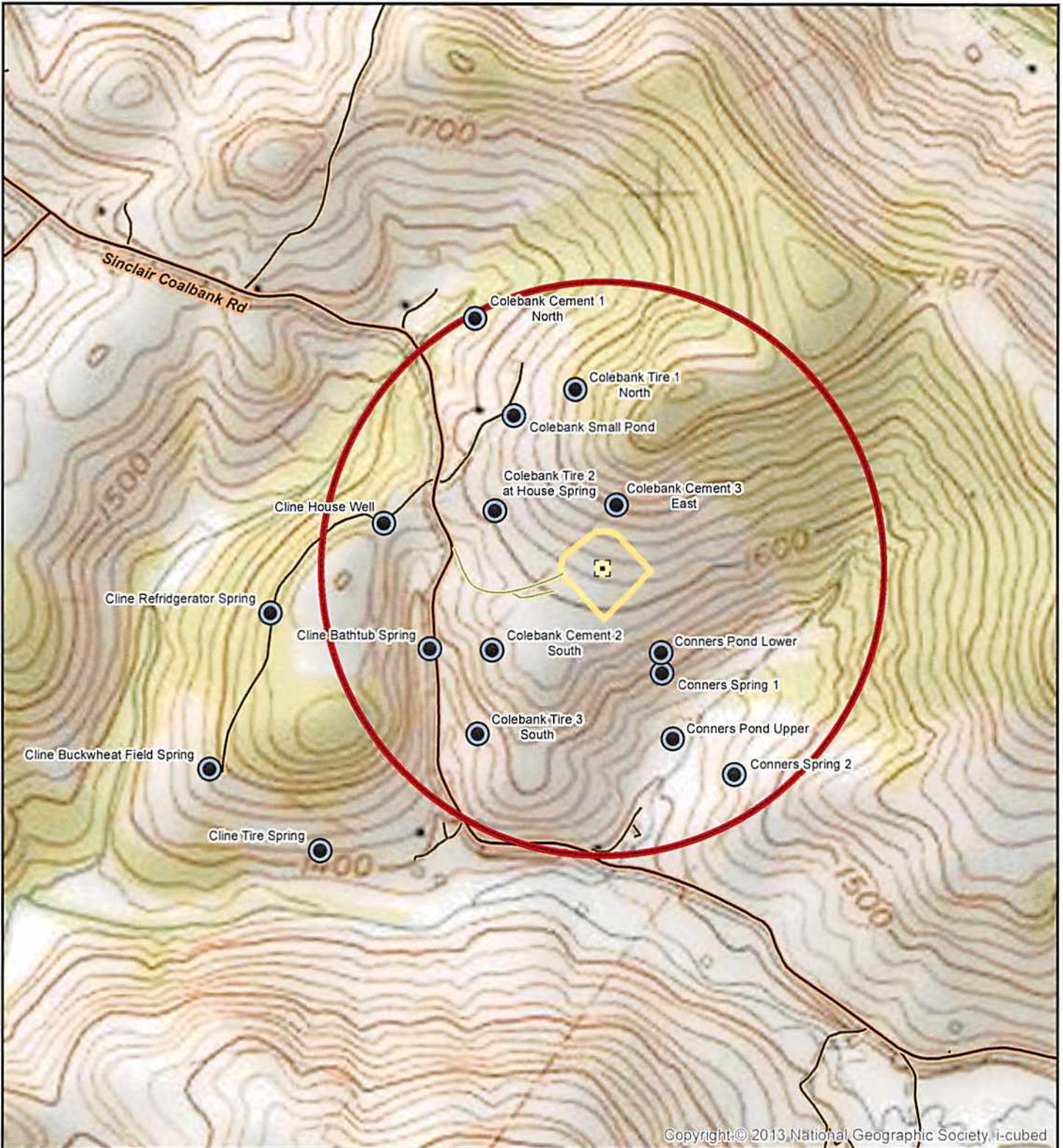
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Title: Oil Gas Inspector

Date: 12/16/2013 DEC 19 2013

Field Reviewed? ( X ) Yes ( ) No

WV Department of  
Environmental Protection



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### Colebank 1-7HG

- Water Well
- State Roads
- Secondary Roads
- 1,500' Buffer
- Pad Center  
17 N 0600538 4349193
- Pad Access
- Well Pad



**enerPLUS**

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DISCLAIMER: This Geographic Information System (GIS) and its components are designed as a source of reference for answering inquiries, for planning and for modeling. GIS is not intended, nor does it replace legal description information in the Chain of Title and other information contained in official government records such as the County Clerk and Recorder's Office of the courts. In addition, the representations of locations in this GIS cannot be substituted for actual legal surveys.

Author: M Spinelli  
 Department of  
 Environmental Action  
 HCSI  
 Feet  
 HCS CONSULTING SERVICES, INC.

NOTES:

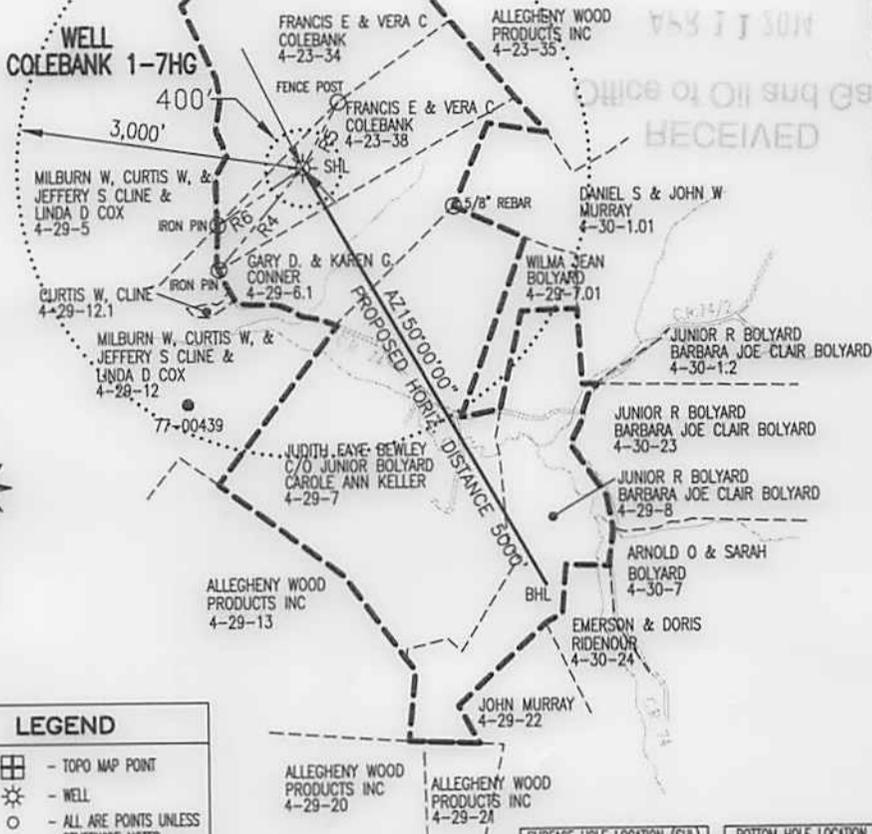
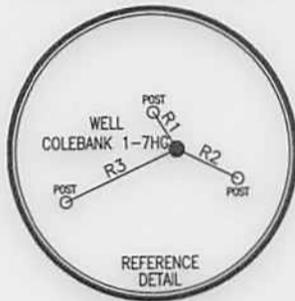
1. There are no water wells or developed springs within 250' of proposed well.
2. There are no existing buildings within 625' of proposed well.
3. Proposed well is greater than 100' from perennial stream, wetland, pond, reservoir or lake.
4. There are no native trout streams within 300' of proposed well.
5. Proposed well is greater than 1000' from surface/groundwater intake or public water supply.
6. It is not the purpose or intention of this plat to represent surveyed locations of the surface or mineral parcels depicted hereon. The location of the boundary lines, as shown, are based on record deed descriptions, field evidence found and/or tax map position, unless otherwise noted.

Latitude: 39°17'30"

COORDINATES:  
253' WEST  
1,990' SOUTH

Longitude: 79°50'00"

GAS LESSORS		
TAX MAP	PARCEL	OIL & GAS ROYALTY OWNERS
4-23	34	FRANCIS E. & VERA C. COLEBANK
4-23	38	FRANCIS E. & VERA C. COLEBANK
4-29	6.1	GARY & KAREN CONNER
4-29	7	JUDITH FAYE BEWLEY
4-29	7	CAROLE ANN KELLER
4-29	8	JUNIOR R. & BARBARA J. BOLYARD
4-29	8	WILMA JEAN BOLYARD



REFERENCE LINES		
LINE	BEARING	DISTANCE
R1	N 32°23'59" W	226.95'
R2	S 63°59'39" E	355.56'
R3	S 65°11'41" W	641.59'
R4	S 40°22'27" W	1374.24'
R5	N 28°35'08" E	783.79'
R6	S 56°46'04" W	1085.98'

LEGEND	
	- TOPO MAP POINT
	- WELL
	- ALL ARE POINTS UNLESS OTHERWISE NOTED.
	- WATER SOURCE
	- MINERAL TRACT BOUNDARY
	- PARCEL LINES
	- WELL REFERENCE
	- PROPOSED HORIZONTAL WELL
	- ROAD
	- STREAM CENTER LINE

SURFACE HOLE LOCATION (SHL)	BOTTOM HOLE LOCATION (BHL)
<b>UTM 17-NAD83</b> N:4349186.844 E:600540.893  NAD83, WV NORTH N:286537.1325 E:1873901.9319  LAT/LON DATUM-WGS84 LAT:39°17'10.38" LON:79°50'03.17"	<b>UTM 17-NAD83</b> N:4347879.781 E:601324.376  NAD83, WV NORTH N:282206.6300 E:1876402.1300  LAT/LON DATUM-WGS84 LAT:39°16'27.66" LON:79°49'31.18"

**Blue Mountain Inc.**  
 11023 MASON DIXON HIGHWAY  
 BURTON, WV 26562  
 PHONE: (304) 662-6486

FILE #: COLEBANK 1-7HG  
 DRAWING #: COLEBANK 1-7HG  
 SCALE: 1" = 2000'  
 MINIMUM DEGREE OF ACCURACY: 1/2500  
 PROVEN SOURCE OF ELEVATION: U.S.G.S. MONUMENT THOMAS 1498.81'

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]*  
 R.P.E.: \_\_\_\_\_ L.L.S.: P.S. No. 2000



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



DATE: MARCH 31, 2014  
 OPERATOR'S WELL #: COLEBANK 1-7HG  
 API WELL #: 47 077 00603H6A  
 STATE COUNTY PERMIT

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

WATERSHED: UNNAMED TRIBUTARY TO SANDY CREEK ELEVATION: 1615.00'  
 COUNTY/DISTRICT: PRESTON / RENO QUADRANGLE: FELLOWSVILLE, WV 7.5'  
 SURFACE OWNER: FRANCIS E. & VERA C. COLEBANK ACREAGE: 59.42±  
 OIL & GAS ROYALTY OWNER: SEE ABOVE GAS LESSORS CHART ACREAGE: 485.70±

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

TARGET FORMATION: MARCELLUS ESTIMATED DEPTH: TVD: 8,156.5± TMD: 12,952±  
 WELL OPERATOR: ENERPLUS RESOURCES (USA) CORPORATION DESIGNATED AGENT: TERRY STAMPER  
 Address: 1700 LINCOLN STREET, SUITE 1300 Address: 5400 D BIG TYLER ROAD  
 City: DENVER State: CO Zip Code: 80203 City: CHARLESTON State: WV Zip Code: 25313