



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

June 11, 2014

WELL WORK PERMIT

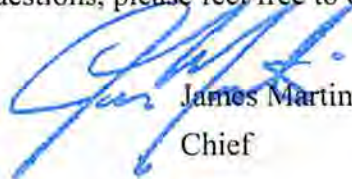
Horizontal 6A Well

This permit, API Well Number: 47-7700610, issued to MOUNTAINEER KEYSTONE, LLC, 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: VINCENT 205
Farm Name: VINCENT, DONALD
API Well Number: 47-7700610
Permit Type: Horizontal 6A Well
Date Issued: 06/11/2014

Promoting a healthy environment.

06/13/2014

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: Mountaineer Keystone, LLC 494501227 Preston Lyon Fellowsville
Operator ID County District Quadrangle

2) Operator's Well Number: Vincent 205 Well Pad Name: Vincent

3) Farm Name/Surface Owner: Donald Vincent Public Road Access: CR 60/4

4) Elevation, current ground: 1673 Elevation, proposed post-construction: 1675

5) Well Type (a) Gas Oil Underground Storage

Other

(b) If Gas Shallow Deep

Horizontal

6) Existing Pad: Yes or No No

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Marcellus Shale, 8375 ft. (TVD Heel) - 8207 ft. (TVD Toe), 100 ft., 0.5psi/ft.

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8) Proposed Total Vertical Depth: 8375'

9) Formation at Total Vertical Depth: Marcellus Shale

MAY 07 2014

10) Proposed Total Measured Depth: 14173'

WV Department of
Environmental Protection

11) Proposed Horizontal Leg Length: 6530'

12) Approximate Fresh Water Strata Depths: surface to 800'

13) Method to Determine Fresh Water Depths: offsetting wells reported water depths (091-000097, 077-00480, 077-00483, 077-00564)

14) Approximate Saltwater Depths: 1000' - 1470'

15) Approximate Coal Seam Depths: Bakorstown - 380', Brush Creek - 490', Upper Freeport - 580', Lower Freeport - 530', Upper Kittaning - 705', Middle Kittaning - 750', Lower Kittaning - 770'

16) Approximate Depth to Possible Void (coal mine, karst, other): none known

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

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Office of Oil and Gas

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

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Office of Oil and Gas
Depth: _____

Seam: _____

Owner: _____

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Environmental Protection

Environmental Protection

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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"	New	H-40	94#	120'	120'	Grout
Fresh Water	13.375"	New	J-55	54.5#	900'	900'	CTS
Coal							
Intermediate	9.625"	New	J-55	36#	1900'	1900'	CTS
Production	5.5"	New	P-110	20#	13,866'	13,866'	TOC@1,700'
Tubing							
Liners							

SD 2/14/2014
SDW219/2014

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	26"	0.417"	1530	None	None
Fresh Water	13.375"	17.5"	0.38"	2730	Class A & 1.5% Cacl	1.18
Coal						
Intermediate	9.625"	12.25"	0.352"	3520	Type 1 & 1.5% Cacl	1.2
Production	5.5"	8.75"	0.361"	14360	50/50 Type 1	1.2
Tubing						
Liners						

PACKERS

Kind:				
Sizes:				
Depths Set:				

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(9/13)

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

The well will be started with a conductor rig drilling a 26" hole to Conductor programmed depth then running 20" casing and grout cement back to surface. The conductor rig will move out and the drilling rig will move in and rig up. The drilling rig will then spud a 17 1/2" hole and drill to fresh water casing (Surface) to the programmed depth, Run 13 3/8" casing and cement to surface. The rig will continue drilling a 12 1/4" intermediate hole to the programmed depth, run 9 5/8" casing and cement to surface. The rig will then continue to drill a 8 3/4" hole to a designed KOP and then start drilling the curve and lateral section to the programmed total measured depth, run 5 1/2" casing and cement according to the program.

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

The well will be completed using a plug and perforation method and stimulated with a slickwater and sand slurry. The anticipated maximum rate will be 90 bpm and the maximum pressure will be 9,500 psi.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 9.8 acres

22) Area to be disturbed for well pad only, less access road (acres): 5.7 acres

23) Describe centralizer placement 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 1,700' TOC will be 1,700'; there will be no centralizers from 1,700' to surface.

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

*See attached sheet

25) Proposed borehole conditioning procedures:

*See attached sheet

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*Note: Attach additional sheets as needed.

Mountaineer Keystone



Vincent, John 205

Cement Additives and Borehole Conditioning Procedures

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

20" is drive pipe. The 13 3/8" casing will be cemented to surface with Class A cement and no greater than 3% CaCl (calcium chloride). The 9 5/8" casing will be cemented to surface with Type 1 cement, and no greater than 3% calcium chloride. The 5 1/2" production string will be cemented back to 1,700' (+/- 200' above the casing shoe for the 9 5/8") with Type 1 or Class A cement retarder (to extend pumpability) cellophane flaked for fluid loss, Bentonite gel as an extender (increased pumpability and fluid loss), a defoaming agent to decrease cement foaming during mixing to insure the cement is of proper weight to placement and possibly a gypsum gas blocking additive to aid in blocking/gas migration (in combination with other additive mentioned here, helps cement achieve a "right-angle" set) during the plastic phase of the cement set-up.

25) Proposed borehole conditioning procedures:

Top holes will be drilled with fresh water to KOP. At KOP, the wellbore will be loaded with synthetic oil based mud, barite-weighted mud system with such properties as to build a filter-cake on the face to the bore-hole. This will provide lubricity as well as stabilizing the well bore. We will begin rotating the drill string and mud will be circulated upon reaching TD until no further cuttings are observed coming across the shaker screens. Once clean mud is circulated back to surface, we will pull three stands of drill pipe, load the hole, pull three stands and load the hole. The weight indicator on the rig will be monitored for any occurrences of drag and if any are noticed, we will re-run the previous stand of pipe pulled across and circulate 2X bottoms up while watching the shakers for signs of cuttings. Once at the base of the curve, the string will be continuously rotated while pumping 2X bottoms up. We will pull three stands and fill the hole until we reach the vertical section of the well.

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06/13/2014

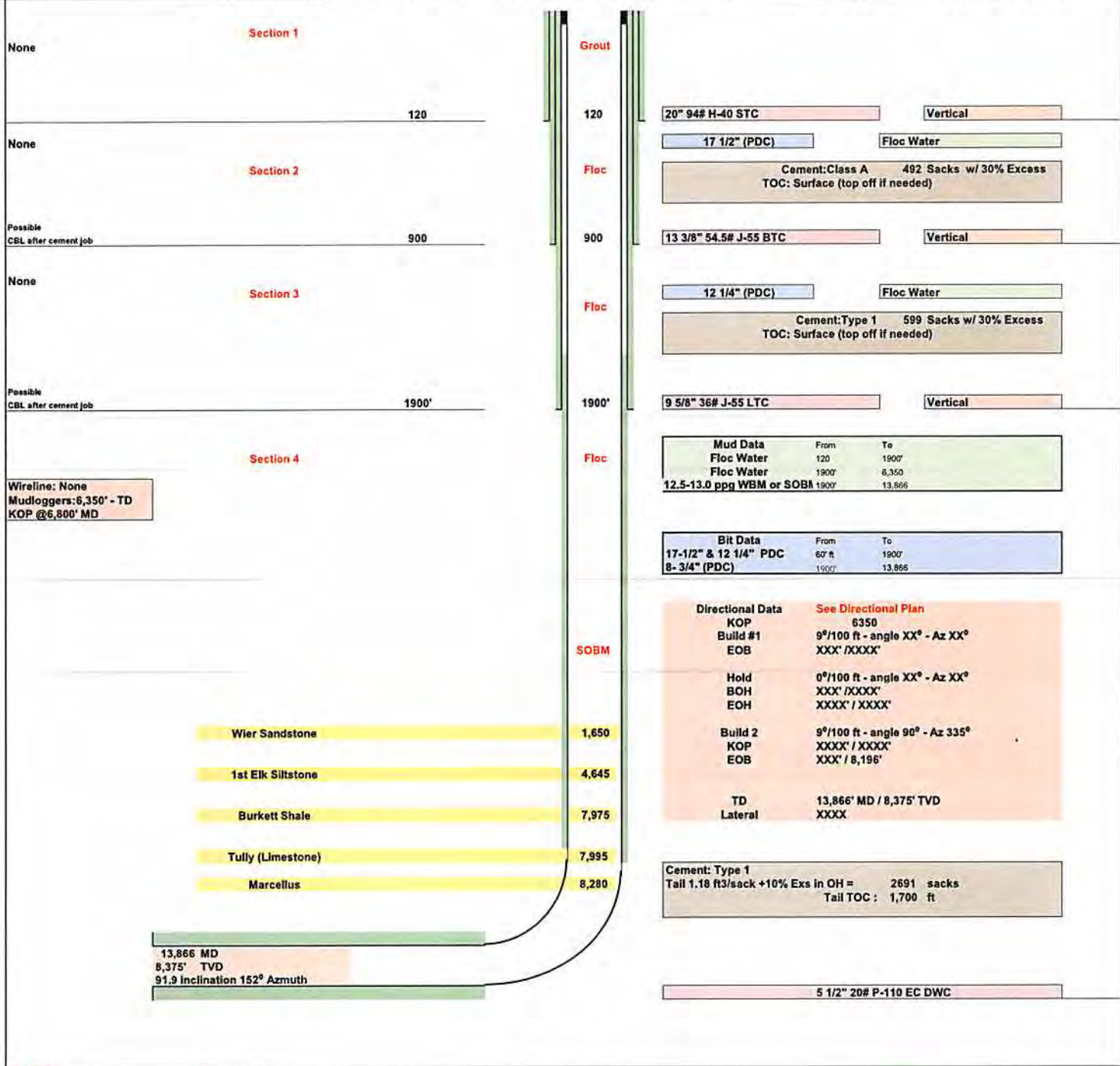


Mountaineer Keystone
Vincent #205
Casing Design
Directional Plan #1 (Phoenix)

Other Names:	Vincent Well
Surface Location:	See Direction Plan
Bottom Hole Location:	See Direction Plan

County:	Barbour
State:	West Virginia
AFE #:	API #:
RKB:	24
Ground Level:	1,675

Logs	Significant Formations (TVD)	Depth (ft) MD	Depth (ft) TVD	Hole Size	Casing and Cement	Mud	Directional & Surveys Drlg /Csq Point
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Revision 1
Note: Not drawn to scale
Cement Outside Casing Seal Assembly in Annulus
Date Last Revised: 16-Dec-13
Ross Schweitzer

20" 94# H-40 STC Vertical

17 1/2" (PDC) Flocc Water

Cement: Class A 492 Sacks w/ 30% Excess
TOC: Surface (top off if needed)

13 3/8" 54.5# J-55 BTC Vertical

12 1/4" (PDC) Flocc Water

Cement: Type 1 599 Sacks w/ 30% Excess
TOC: Surface (top off if needed)

9 5/8" 36# J-55 LTC Vertical

Mud Data	From	To
Flocc Water	120	1900'
Flocc Water	1900'	8,350
12.5-13.0 ppg WBM or SOBA	1900'	13,866

Bit Data	From	To
17-1/2" & 12 1/4" PDC	60' ft	1900'
8-3/4" (PDC)	1900'	13,866

Directional Data	See Directional Plan
KOP	6350
Build #1	9°/100 ft - angle XX° - Az XX°
EOB	XXX' / XXXX'
Hold	0°/100 ft - angle XX° - Az XX°
BOH	XXX' / XXXX'
EOH	XXXX' / XXXX'
Build 2	9°/100 ft - angle 90° - Az 335°
KOP	XXXX' / XXXX'
EOB	XXX' / 8,196'
TD	13,866' MD / 8,375' TVD
Lateral	XXXX

Cement: Type 1
Tail 1.18 ft/sack +10% Exs in OH = 2691 sacks
Tail TOC : 1,700 ft

5 1/2" 20# P-110 EC DWC

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Office of Oil and Gas
WV Dept. of Environmental Protection

Form WW-9

Vincent 205

Operator's Well No.

Mountaineer Keystone, LLC

Proposed Revegetation Treatment: Acres Disturbed 11.2 Prevegetation pH _____

Lime 6 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20

Fertilizer amount 1000 lbs/acre

Mulch 3-4 Tons/acre

Seed Mixtures

Temporary

Permanent

Seed Type lbs/acre
KY-31 Tall Fescue 50

Seed Type lbs/acre
Fosters Permium Meadow Mix 50

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:

[Handwritten signatures]

Comments:

Seed & mulch ASAP.

Title: Oil & Gas Inspector

Date: 2/19/2014

Field Reviewed? Yes No

Mountaineer Keystone



Delivery Acknowledgement for
Site Specific
Safety and Environmental Plan
For
Vincent 205
Preston County, WV
Date Prepared: 2/11/2014

Mounatineer Keystone

[Signature] ^{SOW}

WV Oil and Gas Inspector 2/19/2014

Title

[Signature]

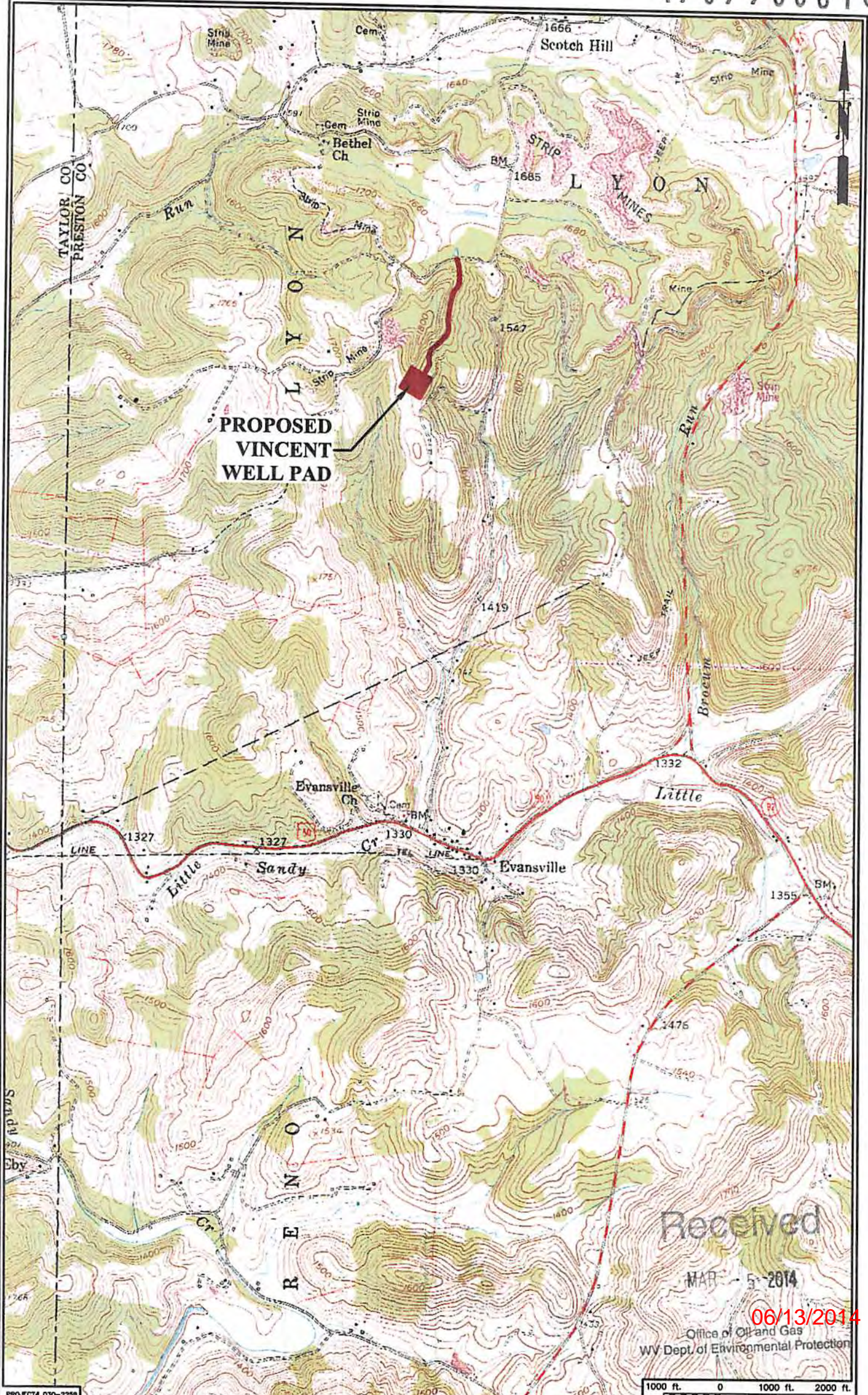
Title

Date

2/19/2014

Date

Received
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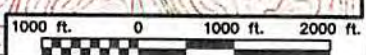
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 LAYOUT: 2457-wp-6
 USER: bmsmeyer

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MAR 5 2014

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Office of Oil and Gas
 WV Dept. of Environmental Protection



PROJECT# 030-2259

THRASHER
 THE THRASHER GROUP INC.
 CIVIL • ENVIRONMENTAL • CONSULTING • FIELD SERVICES
 600 WHITE OAKS BOULEVARD, BRIDGEPORT, WV 26330
 PHONE (304) 624-4108 • FAX (304) 624-7831

Mountaineer
Keystone
 LLC

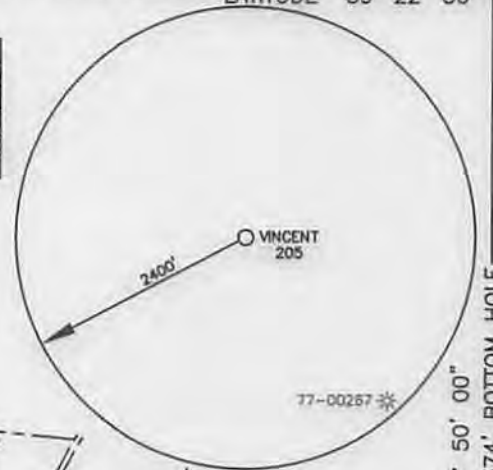
VINCENT WELL PAD
 FELLOWSVILLE & THORNTON, WV
 QUAD MAPS

SHEET No.
1

**MOUNTAINEER KEYSTONE
WELL NO. VINCENT 205**

NOTES:
- FLAT BEARINGS AND DISTANCES ARE BASED ON NAD2011 (CORPS) WV STATE PLANES NORTH, GRID NORTH ELEVATIONS BASED ON GEOID2012A US SURVEY FEET UNLESS SHOWN OTHERWISE.
- THERE ARE NO (0) WATER WELL(S) LOCATED WITHIN 250' OF WELL 205.
- THERE ARE NO (0) DWELLINGS OR AGRICULTURAL STRUCTURES WITHIN 625' OF WELL 205.

	TM	PAR	OWNER
A	17	39	D. VINCENT
B	18	32	F.M. JENNINGS & P.A. JENNINGS
C	21	3	F.M. JENNINGS & P.A. JENNINGS
D	20	7	R.D. HOVATTER JR., S.V. HOVATTER & M.R. CLINE-SWISHER
E	10	27	A. BLAINE & E.L. JENNINGS



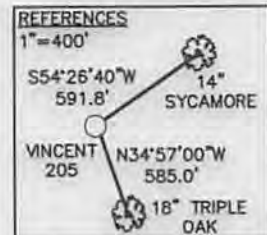
TH/BH

DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAP

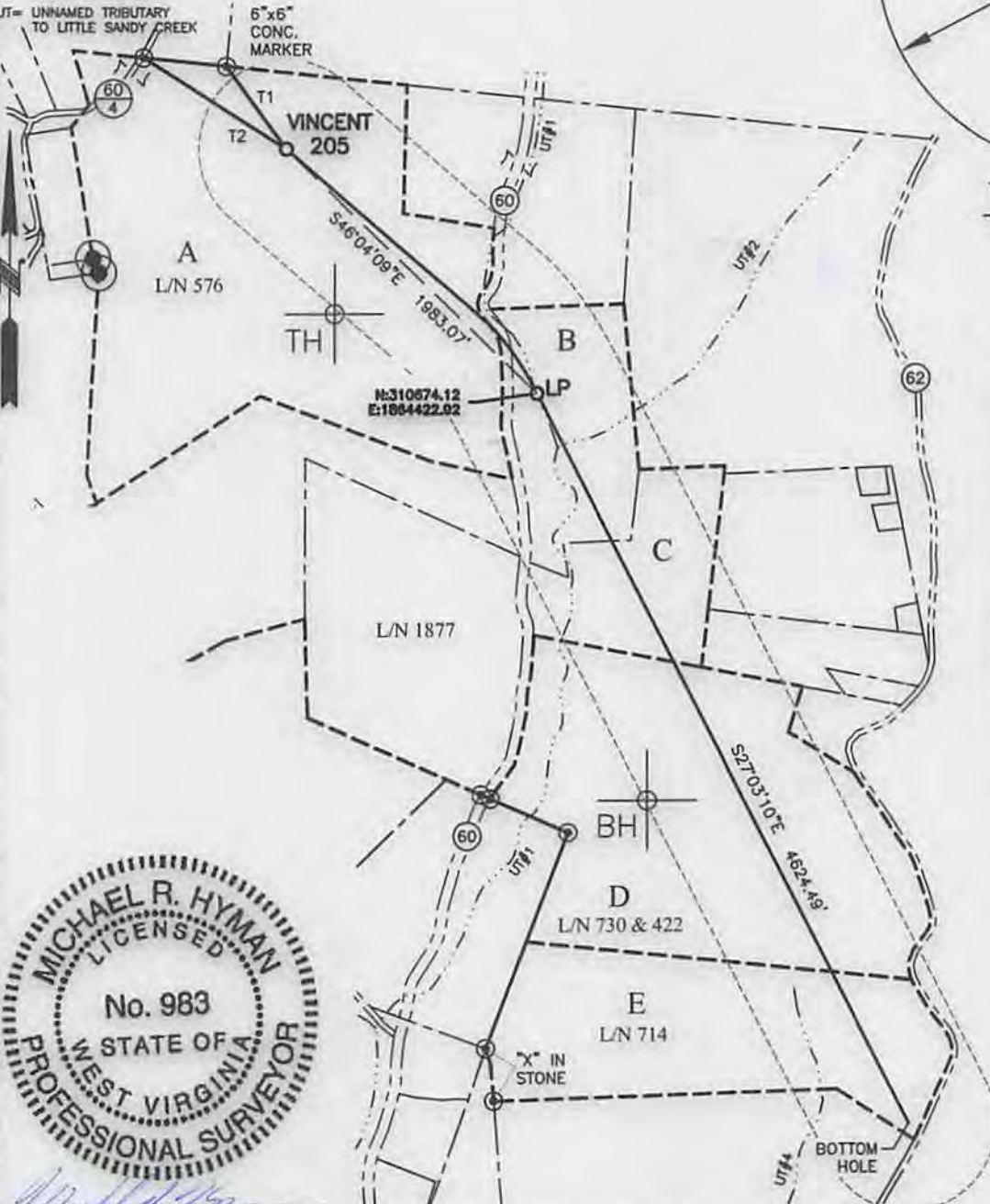
LEASE BOUNDARY
500' BUFFER

WELL NO. VINCENT 205 TOP HOLE UTM COORDINATES-ZONE 17 (NAD 83-METER) N:4356905.09 E:597088.12
WELL NO. VINCENT 205 LANDING POINT UTM COORDINATES-ZONE 17 (NAD 83-METER) N:4356493.11 E:597530.22
WELL NO. VINCENT 205 BOTTOM HOLE UTM COORDINATES-ZONE 17 (NAD 83-METER) N:4355248.91 E:598191.91

T1	S36°34'40"E	574.7'
T2	S58°00'30"E	780.9'



UT= UNNAMED TRIBUTARY TO LITTLE SANDY CREEK
6"x6" CONC. MARKER



Michael R. Hyman, P.S. 983

I THE UNDERSIGNED, HEREBY CERTIFY THAT THIS PLAT IS CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF AND SHOWS ALL THE INFORMATION REQUIRED BY LAW AND THE RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

FILE NO. <u>030-2457</u>	DATE <u>FEBRUARY 27</u> , 2014
SCALE: <u>1"=1000'</u>	OPERATOR'S WELL NO. <u>VINCENT 205</u>
MINIMUM DEGREE OF ACCURACY: <u>1 in 2500</u>	API WELL NO.
PROVEN SOURCE OF ELEVATION: <u>SURVEY GRADE GPS</u>	<u>47</u> - <u>077</u> - <u>00610 H 6A</u>
	STATE COUNTY PERMIT

STATE OF WEST VIRGINIA
DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF OIL & GAS

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL (IF "GAS"), PRODUCTION STORAGE DEEP SHALLOW

LOCATION: ELEVATION: 1675.08 WATER SHED: SANDY CREEK

DISTRICT: LYON COUNTY: PRESTON

QUADRANGLE: FELLOWSVILLE ACREAGE: 111.715 AC±

SURFACE OWNER: DONALD VINCENT LEASE ACREAGE: 321.13 AC+

OIL & GAS ROYALTY OWNER: DONALD VINCENT, FRANKLIN M. & PEGGY A. JENNINGS, ROBERT DALE HOVATTER Jr. & SUSAN VIRGINIA HOVATTER & MARY ROXANNE CLINE-SWISHER, A. BLAINE & ELENORA L. JENNINGS LEASE NO. 422/576/714/730/1877



PROPOSED WORK: DRILL CONVERT DRILL DEEPER REDRILL FRACTURE OR STIMULATE PERFORATE NEW FORMATION PLUG OFF OLD FORMATION OTHER PHYSICAL CHANGE IN WELL (SPECIFY) _____

PLUG AND ABANDON _____ CLEAN OUT AND REPLUG _____

TARGET FORMATION: MARCELLUS SHALE ESTIMATED DEPTH: 8,360' TVD / 13,866' MD

WELL OPERATOR: MOUNTAINEER KEYSTONE DESIGNATED AGENT: NATHAN SKEEN

ADDRESS: 1111 VAN VOORHIS ROAD, SUITE G MORGANTOWN, WV 26505 ADDRESS: 1111 VAN VOORHIS ROAD, SUITE G MORGANTOWN, WV 26505

USER: kpoth LAYOUT: 205-1000 PLOT DATE/TIME: 3/13/2014 - 2:11pm CAD FILE: R:\030-2457 Mountaineer Keystone Vincent\Survey\030-2457 D VINCENT PLATS RVSD 2-27-14.dwg