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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

January 16, 2014

**WELL WORK PERMIT**

**Horizontal 6A Well**

This permit, API Well Number: 47-5101698, issued to GASTAR EXPLORATION USA, INC., 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: BLAKE NO. 3H  
Farm Name: BUNGARD, WILBERT H. , ET AL  
**API Well Number: 47-5101698**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 01/16/2014

## 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

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1. This proposed activity may require permit coverage from the United States Army Corps of Engineers (USACOE). Through this permit, you are hereby being advised to consult with USACOE 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

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

1) Well Operator: Gastar Exploration 494487685 Marshall Franklin Powhatan Point 7.5'  
Operator ID County District Quadrangle

2) Operator's Well Number: 3H Well Pad Name: Blake

3) Farm Name/Surface Owner: Wilber H Bungard, et ux Public Road Access: Burch Ridge Co. Rt. 29

4) Elevation, current ground: 1345' Elevation, proposed post-construction: 1326'

5) Well Type (a) Gas  Oil  Underground Storage

Other

(b) If Gas Shallow  Deep

Horizontal

6) Existing Pad: Yes or No No

*MDIC 10/17/2013*

*JM 10/17/13*

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
The Marcellus is the target formation at at depth of 6,571' (top of formation), an anticipated thickness of 55' and a pressure of 3000 psi.

8) Proposed Total Vertical Depth: 6,726'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 12,612'

11) Proposed Horizontal Leg Length: 5550'

12) Approximate Fresh Water Strata Depths: 60'

13) Method to Determine Fresh Water Depths: Gastar has drilled several wells in this area

14) Approximate Saltwater Depths: 2000'

15) Approximate Coal Seam Depths: 900' & 1000'

16) Approximate Depth to Possible Void (coal mine, karst, other): N/A

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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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	A500	52.75 #/ft		120'	Cement to Surface
Fresh Water	13 3/8"	New	H-40	48 #/ft		1150'	Cement to Surface
Coal							
Intermediate	9 5/8"	New	J-55	36 #/ft		2600'	Cement to Surface
Production	5 1/2"	New	P-110	20 #/ft		12,612'	Cement to Surface
Tubing	2 3/8"	New	N-80	4.7 #/ft		6,950'	
Liners							

*MSK 10/17/2013* *JL 10/17/13*

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20'	30"	.25"	880 psi	See #24	1.2
Fresh Water	13 3/8"	17 1/2"	.33"	1730 psi	See #24	1.2
Coal						
Intermediate	9 5/8"	12 1/4"	.352"	3520 psi	See #24	1.2
Production	5 1/2"	8 7/8" & 8 3/4"	.361"	12,640 psi	See #24	1.21
Tubing	2 3/8"		.19"	11,200 psi		
Liners						

PACKERS

Kind:	n/a			
Sizes:	n/a			
Depths Set:	n/a			

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OCT 22 2013

WW-6B  
(9/13)

051 01698

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

Drill through the Marcellus tagging less than One Hundred (100') feet from the top of the Onondaga to get depths and log data. Then plug the well back to proposed kick off point (TBD). Drill the horizontal section to planned and proposed TD. Run casing and cement back to surface. Run a bond log on part of the curve and vertical section, pressure test casing and set a master valve. Make a clean out run on the casing and perforate then stimulate.

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

Gastar Exploration plans to fracture the well using a typical slickwater fracture design. Gastar will pump roughly 5700bbls of water and 200,000 lbs of sand per stage. There will be approximately 21 stages on the fracturing job.  
  
Anticipated maximum surface pressure while fracing will be approximately 8500 psi with an anticipated maximum rate of 90 bbls/min.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 20.67

22) Area to be disturbed for well pad only, less access road (acres): 5.37

23) Describe centralizer placement for each casing string:

Gastar will run 3 Centralizers on the Surface casing at an equal distance apart. The Intermediate casing will have 7 Centralizers at 300 ' spacing. The production casing will have one centralizer every other joint in the lateral, one centralizer per joint through the curve and one centralizer every other joint in the the vertical section.

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

See attached.

25) Proposed borehole conditioning procedures:

Gastar will circulate the hole a minnimum of 3 hours upon TD. We will then pull out to the bottom of the curve and circulate for another 2 hours. Then come out of the hole.

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\*Note: Attach additional sheets as needed.

Blake 3H WW6B

24) 13 3/8" Casing Cement - Class A + 3% CaCl<sub>2</sub> + 1/4# Flake - Surface Cement mixed at 15.6 ppg

CaCl<sub>2</sub> (calcium chloride), Flake (cellophane flake)

9 5/8" Casing Cement – Class A + 1% EC-1 + .75 gals/100 sacks FP-12L + .5% SMS + .55% BA-10A + 1/4# Flake - Intermediate Cement mixed at 15.6 ppg

CaCl<sub>2</sub> (calcium chloride), Flake (cellophane flake), EC-1 (Low Temp Bonding Agent), BA-10A (Bonding Agent/Pseudo-latex), SMS (Sodium Metasilicate, accelerator), FP-12L (Foam Preventor)

5 1/2" Casing Lead Cement - 50:50 Class H .2%CD32 1.2%FL62 .1%ASA301 .4%SMS - mixed 14.5 ppg.

- CD32 (cement dispersant), FL 62 (fluid loss), SMS (sodium metasilicate), ASA (minimizes free fluid)

5 1/2" Casing Tail Cement - 50:50 Class A + 3 #/sk BA-90 + .2% MPA-170 + .4% R-3 - mixed at 14.5 ppg.

-R3 (Retarder), BA-90(Bonding Agent), MPA-170 (Gas Migration)

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JAN 15 2014

WV Department of  
Environmental Protection

01/17/2014

051 01698



# GASTAR EXPLORATION USA, INC.

Location: Marshall County, WV  
 Field: Marshall  
 Facility: Blake Unit

Slot: Slot #03  
 Well: Blake 3H  
 Wellbore: Blake 3H PWB



### Location Information

Facility Name			Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Blake Unit			1695207.000	14440891.700	39°45'50.736"N	80°48'18.091"W
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot #03	37.21	14.71	1695221.700	14440928.900	39°45'51.103"N	80°48'17.901"W
Rig on Slot #03 (RT) to Mud line (At Slot: Slot #03)						0ft
Mean Sea Level to Mud line (At Slot: Slot #03)						-1326ft
Rig on Slot #03 (RT) to Mean Sea Level						1326ft

### Well Profile Data

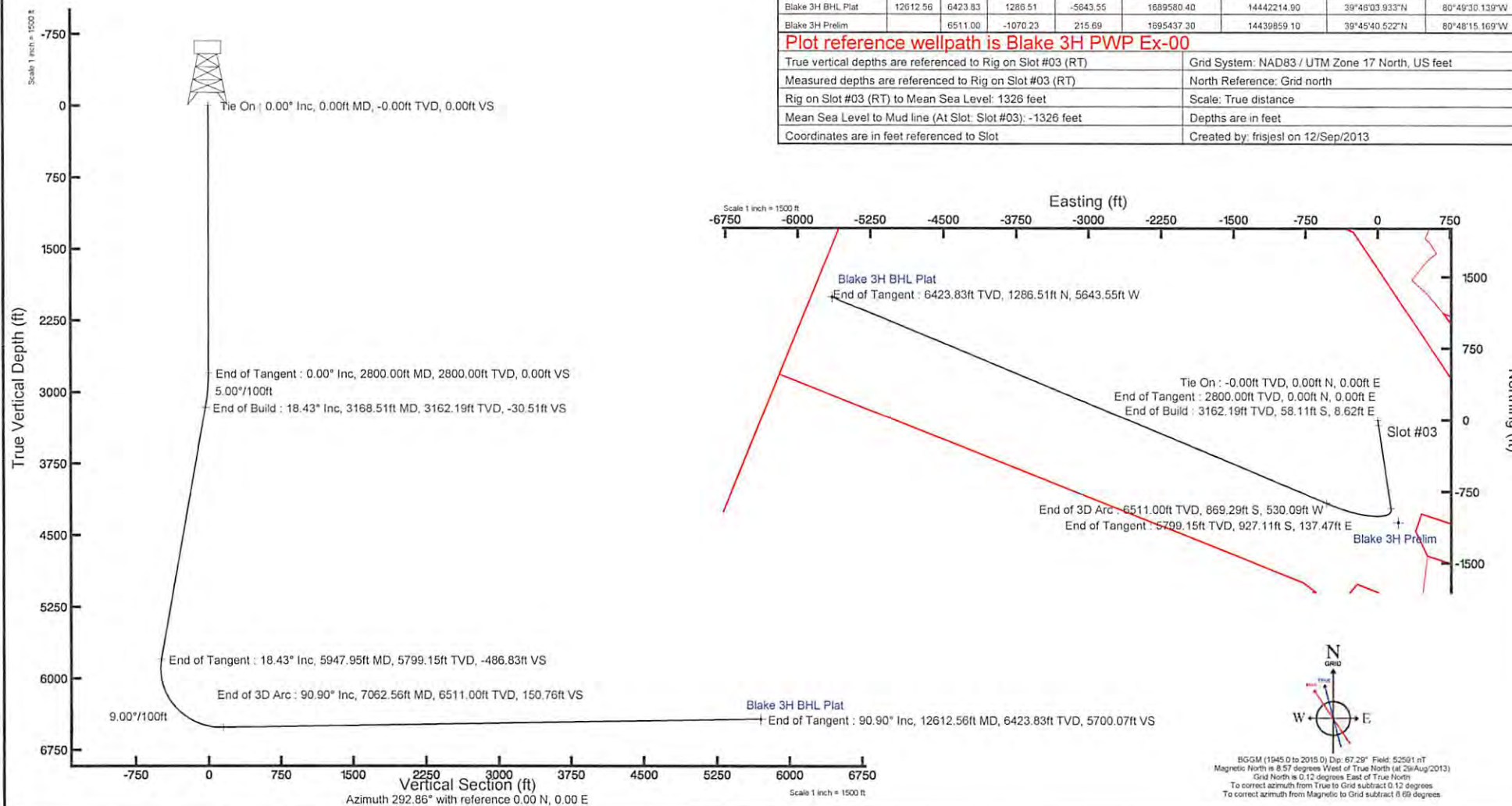
Design Comment	MD (ft)	Inc (°)	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (ft)	VS (ft)
Tie On	0.00	0.000	171.566	0.00	0.00	0.00	0.00	0.00
End of Tangent	2800.00	0.000	171.566	2800.00	0.00	0.00	0.00	0.00
End of Build	3168.51	18.425	171.566	3162.19	-58.11	8.62	5.00	-30.51
End of Tangent	5947.95	18.425	171.566	5799.15	-927.11	13.47	0.00	-486.83
End of 3D Arc	7062.56	90.900	292.860	6511.00	-869.29	530.09	9.00	150.76
End of Tangent	12612.56	90.900	292.860	6423.83	1286.51	-5643.55	0.00	5700.07

### Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Blake 3H BHL Plat	12612.56	6423.83	1286.51	-5643.55	1689580.40	14442214.90	39°48'03.933"N	80°48'30.139"W
Blake 3H Prelim	6511.00	-1070.23	215.69	1695437.30	14439859.10	39°45'40.522"N	80°48'15.169"W	

Plot reference wellpath is Blake 3H PWP Ex-00

True vertical depths are referenced to Rig on Slot #03 (RT)      Grid System: NAD83 / UTM Zone 17 North, US feet  
 Measured depths are referenced to Rig on Slot #03 (RT)      North Reference: Grid north  
 Rig on Slot #03 (RT) to Mean Sea Level: 1326 feet      Scale: True distance  
 Mean Sea Level to Mud line (At Slot: Slot #03): -1326 feet      Depths are in feet  
 Coordinates are in feet referenced to Slot      Created by: frisjesl on 12/Sep/2013



WW-9  
(9/13)

API Number 47 - 051 - \_\_\_\_\_  
Operator's Well No. \_\_\_\_\_ Blake No. 3H \_\_\_\_\_

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Gastar Exploration USA, Inc. OP Code 494487685

Watershed (HUC 10) French Creek - Ohio River (Undefined) Quadrangle Powhatan Point 7.5'

Elevation 1326' County Marshall District Franklin

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: Various formation cuttings

Will a synthetic liner be used in the pit? Yes  No  If so, what ml.? 60

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection ( UIC Permit Number 3416729685 )
- Reuse (at API Number \_\_\_\_\_)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

Will closed loop system be used? If so, describe: Yes for everything drilled synthetic oil based

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

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

Additives to be used in drilling medium? Barite for weight

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. All drill cuttings will be disposed of in Wetzel County Landfill (Permit SWF-1021)

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

-Landfill or offsite name/permit number? Wetzel County Landfill (SWF-1021/MV0109185; Northwestern Landfill (SWF-1025); Arden Landfill in Washington, PA (SWF-100172)

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.

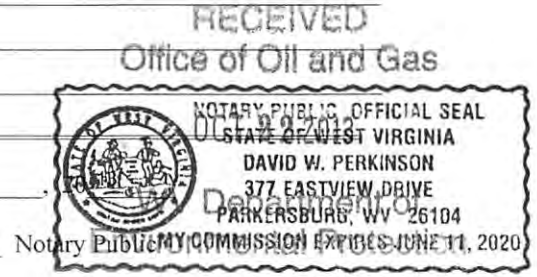
Company Official Signature Michael McCown

Company Official (Typed Name) Michael McCown

Company Official Title Senior Vice President and COO

Subscribed and sworn before me this 16th day of October

David W. Perkinson



My commission expires 06/11/2020

01/17/2014



Form WW-9

Operator's Well No. Blake No. 3H

Proposed Revegetation Treatment: Acres Disturbed 20.67 Prevegetation pH \_\_\_\_\_

Lime 3 Tons/acre or to correct to pH 6.5

Fertilizer type 10-20-20 or equivalent

Fertilizer amount 1/3 Ton lbs/acre

Mulch 2.5 Tons/acre

Seed Mixtures

**Temporary**

**Permanent**

Seed Type lbs/acre  
Annual Ryegrass 40/acre

Seed Type lbs/acre  
Fox Tail / Grassy 40/acre

Perennial Rye 30/acre

Crown Vetch 20/acre

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: [Signature]

Comments: \_\_\_\_\_

Title: Oil + Gas Inspector

Date: 10/17/2013

Field Reviewed? (  ) Yes (  ) No

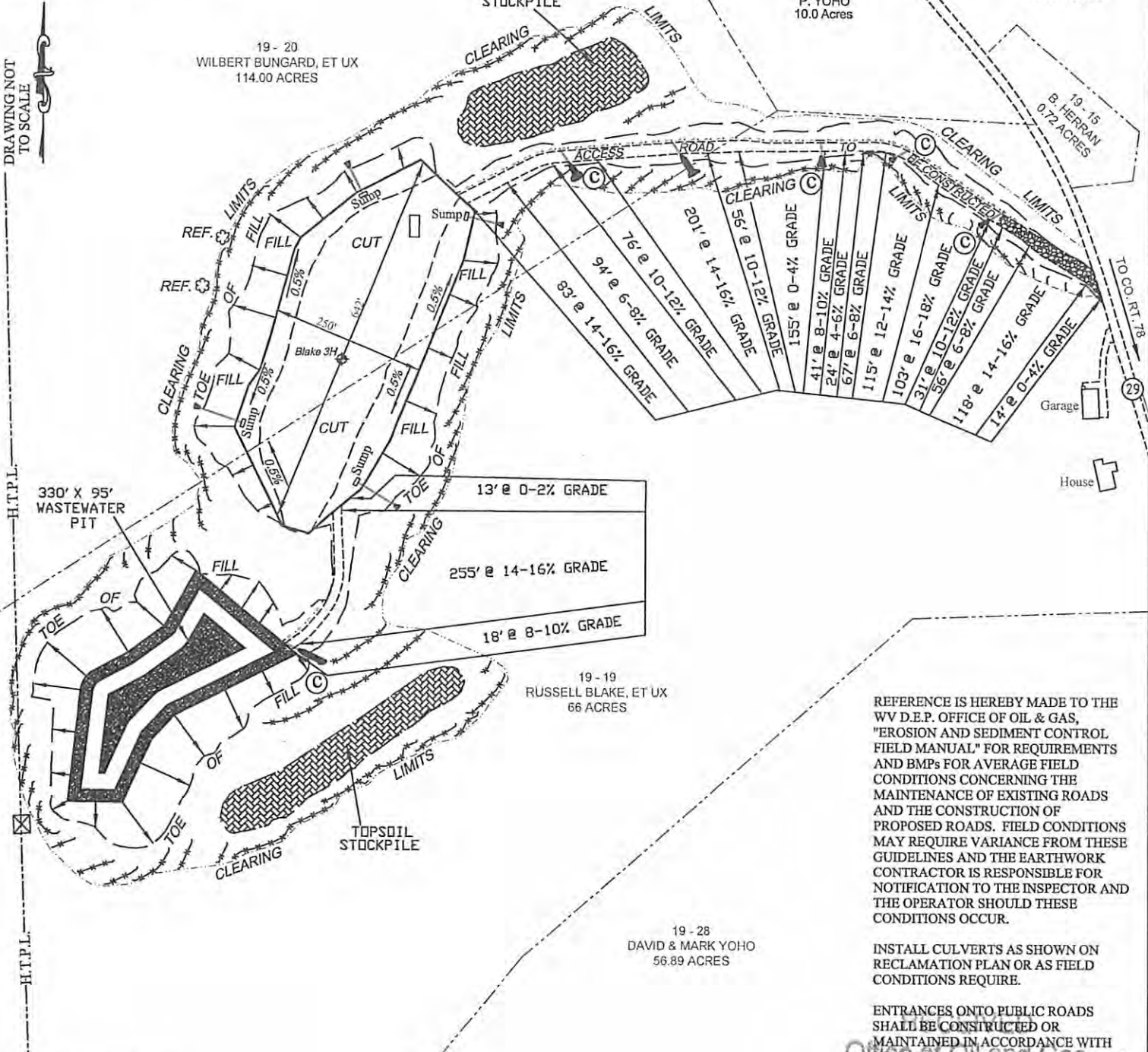
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OCT 22 2013

# PROPOSED BLAKE WELL NO. 3H

ALL TREES 6-INCHES AND ABOVE ARE TO BE CUT AND STACKED. BRUSH SLASHINGS ARE TO UTILIZED DOWN SLOPE OF SITE AND STRUCTURES TO ACT AS A CONTROL BARRIER IF AVAILABLE.

DRAWING NOT TO SCALE



TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.  
ALL CUT AND FILL SLOPES ARE 2H: 1V SLOPE.

REFERENCE IS HEREBY MADE TO THE WV D.E.P. OFFICE OF OIL & GAS, "EROSION AND SEDIMENT CONTROL FIELD MANUAL" FOR REQUIREMENTS AND BMPs FOR AVERAGE FIELD CONDITIONS CONCERNING THE MAINTENANCE OF EXISTING ROADS AND THE CONSTRUCTION OF PROPOSED ROADS. FIELD CONDITIONS MAY REQUIRE VARIANCE FROM THESE GUIDELINES AND THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR NOTIFICATION TO THE INSPECTOR AND THE OPERATOR SHOULD THESE CONDITIONS OCCUR.

INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN OR AS FIELD CONDITIONS REQUIRE.

ENTRANCES ONTO PUBLIC ROADS SHALL BE CONSTRUCTED OR MAINTAINED IN ACCORDANCE WITH WV D.O.T. REGULATIONS. ADDITIONAL PERMITS MAY BE REQUIRED.

Note: OCT 22 2013  
© — Denotes install 18" HDPE culvert and apply appropriate sediment control (Rip Rap splash pad).

\*\*\*\*\* Silt Fence and Erosion Control Measure.



global environmental solutions

# Well Site Safety Plan Gastar Exploration USA, Inc.

MDK  
10/17/2013  
XU  
10/17/13

**Well Name:** Blake 3H

**Pad Location:** Neal Pad

Marshall County, West Virginia

**GPS Coordinates:** Lat. 39° 45'51.10"  
Long. 80° 48'17.90"

SLR Ref: 116.01034.00002

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Office of Oil and Gas

OCT 22 2013

WV Department of  
Environmental Protection  
01/17/2014



## Water Management Plan: Primary Water Sources



WMP-01625

API/ID Number: 047-051-01698

Operator:

Gastar Exploration USA, Inc.

Blake No. 3H

**Important:**

For each proposed primary water source (including source intakes for purchased water sources) identified in your water management plan, and summarized herein, DEP has made an evaluation concerning water availability over the specified date range. DEP's assessment is based on the following considerations:

- Statistical analysis of historical USGS stream gauge data (transferred to un-gauged locations as necessary);
- Identification of sensitive aquatic life (endangered species, mussels, etc.);
- Quantification of known existing demands on the water supply (Large Quantity Users);
- Minimum flows required by the Army Corps of Engineers; and
- Designated stream uses.

Based on these factors, DEP has provided, for each intake location (and origination point for purchased water), a reference gauge location and discharge flow reading which must be surpassed prior to withdrawals. Additionally, DEP has established a minimum passby flow at the withdrawal location which must also be surpassed prior to withdrawals. These thresholds are considered terms of the permit and are enforceable as such.

**DEP is aware that some intake points will be used for multiple wells and well sites. In these cases, the thresholds set by the Water Management Plan are to be interpreted as total withdrawal limits for each location over the specified date range regardless of how many wells are supported by that intake.**

For all purchased water intakes, determinations of water availability are made at the original source intake location. It is the responsibility of the Oil and Gas Operator, not the seller, to cease withdrawal of water from the seller when flows are less than the minimum gauge reading at the stream gauge referenced by the Water Management Plan in order to protect stream uses.

Note that the determinations made herein are based on the best available data, but it is impossible to predict water availability in the future. While the DEP has carefully established these minimum withdrawal thresholds, it remains the operator's responsibility to protect aquatic life at all times. Approval to withdrawal is contingent upon permission from the land owner. It is the responsibility of the operator to secure and maintain permission prior to any withdrawals.

The operator is reminded that 24-48 hours prior to withdrawing (or purchasing) water, DEP must be notified by email at [DEP.water.use@wv.gov](mailto:DEP.water.use@wv.gov).

APPROVED DEC 11 2013

**01/17/2014**

Source Summary

051 01698

WMP-01625

API Number:

047-051-01698

Operator:

Gastar Exploration USA, Inc.

Blake No. 3H

Purchased Water

● Source Bayer Material Science, LLC Marshall Owner: Bayer Material Science, LLC

Start Date	End Date	Total Volume (gal)	Max. daily purchase (gal)	Intake Latitude:	Intake Longitude:
7/1/2014	7/1/2015	5,027,400	649,800	39.7218	-80.830231

Regulated Stream? Ohio River Min. Flow Ref. Gauge ID: 9999999 Ohio River Station: Willow Island Lock & Dam

Max. Pump rate (gpm): Min. Gauge Reading (cfs): 6,468.00 Min. Passby (cfs)

DEP Comments: Refer to the specified station on the National Weather Service's Ohio River forecast website: <http://www.erh.noaa.gov/ohrfc//flows.shtml>

01/17/2014

Source Detail

051 01698

WMP-01625

API/ID Number: 047-051-01698

Operator: Gastar Exploration USA, Inc.

Blake No. 3H

Source ID: 30432 Source Name Bayer Material Science, LLC  
Bayer Material Science, LLC

Source Latitude: 39.7218  
Source Longitude: -80.830231

HUC-8 Code: 5030201

Drainage Area (sq. mi.): 25000 County: Marshall

Anticipated withdrawal start date: 7/1/2014

Anticipated withdrawal end date: 7/1/2015

Endangered Species?  Mussel Stream?

Total Volume from Source (gal): 5,027,400

Trout Stream?  Tier 3?

Max. Pump rate (gpm):

Regulated Stream? Ohio River Min. Flow

Max. Simultaneous Trucks:

Proximate PSD? Grandview-Doolin PSD

Max. Truck pump rate (gpm)

Gauged Stream?

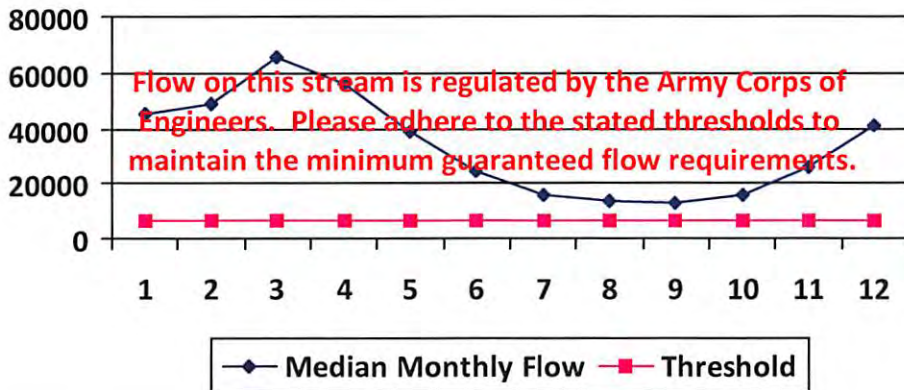
Reference Gaug 9999999 Ohio River Station: Willow Island Lock & Dam

Drainage Area (sq. mi.) 25,000.00

Gauge Threshold (cfs): 6468

Month	Median monthly flow (cfs)	Threshold (+ pump)	Estimated Available water (cfs)
1	45,700.00	-	-
2	49,200.00	-	-
3	65,700.00	-	-
4	56,100.00	-	-
5	38,700.00	-	-
6	24,300.00	-	-
7	16,000.00	-	-
8	13,400.00	-	-
9	12,800.00	-	-
10	15,500.00	-	-
11	26,300.00	-	-
12	41,300.00	-	-

Water Availability Profile



Water Availability Assessment of Location

Base Threshold (cfs):	-
Upstream Demand (cfs):	-
Downstream Demand (cfs):	-
Pump rate (cfs):	-
Headwater Safety (cfs):	0.00
Ungauged Stream Safety (cfs):	0.00
Min. Gauge Reading (cfs):	-
Passby at Location (cfs):	-

"Threshold", as depicted in the chart above is meant only to indicate the calculated base threshold at the proposed withdrawal location. This value does not include the proposed pump rate or existing demand on the stream. Refer to the monthly breakdown above for a more complete estimation of water availability by month.

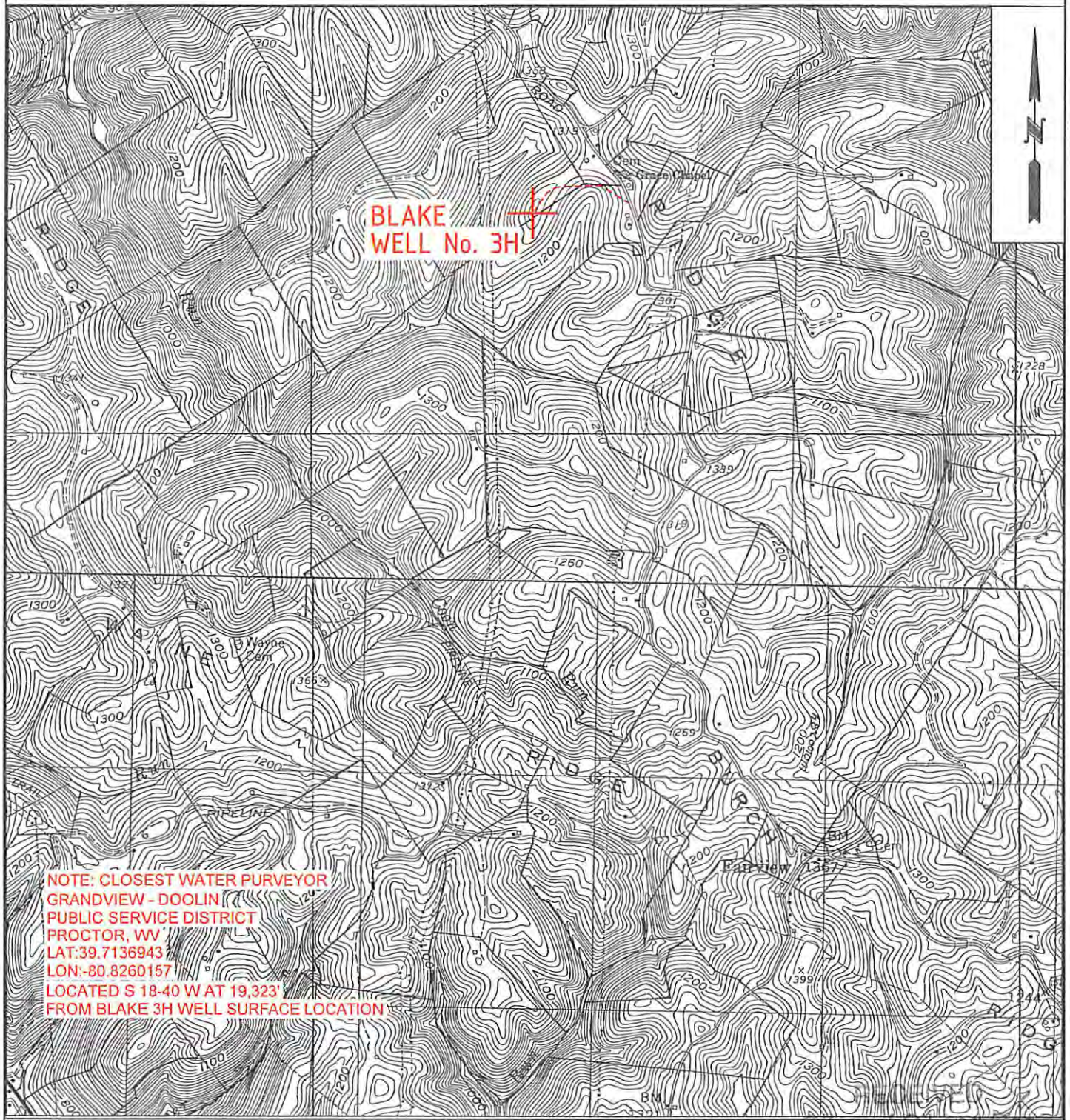
01/17/2014

WW-9

# PROPOSED BLAKE WELL No. 3H

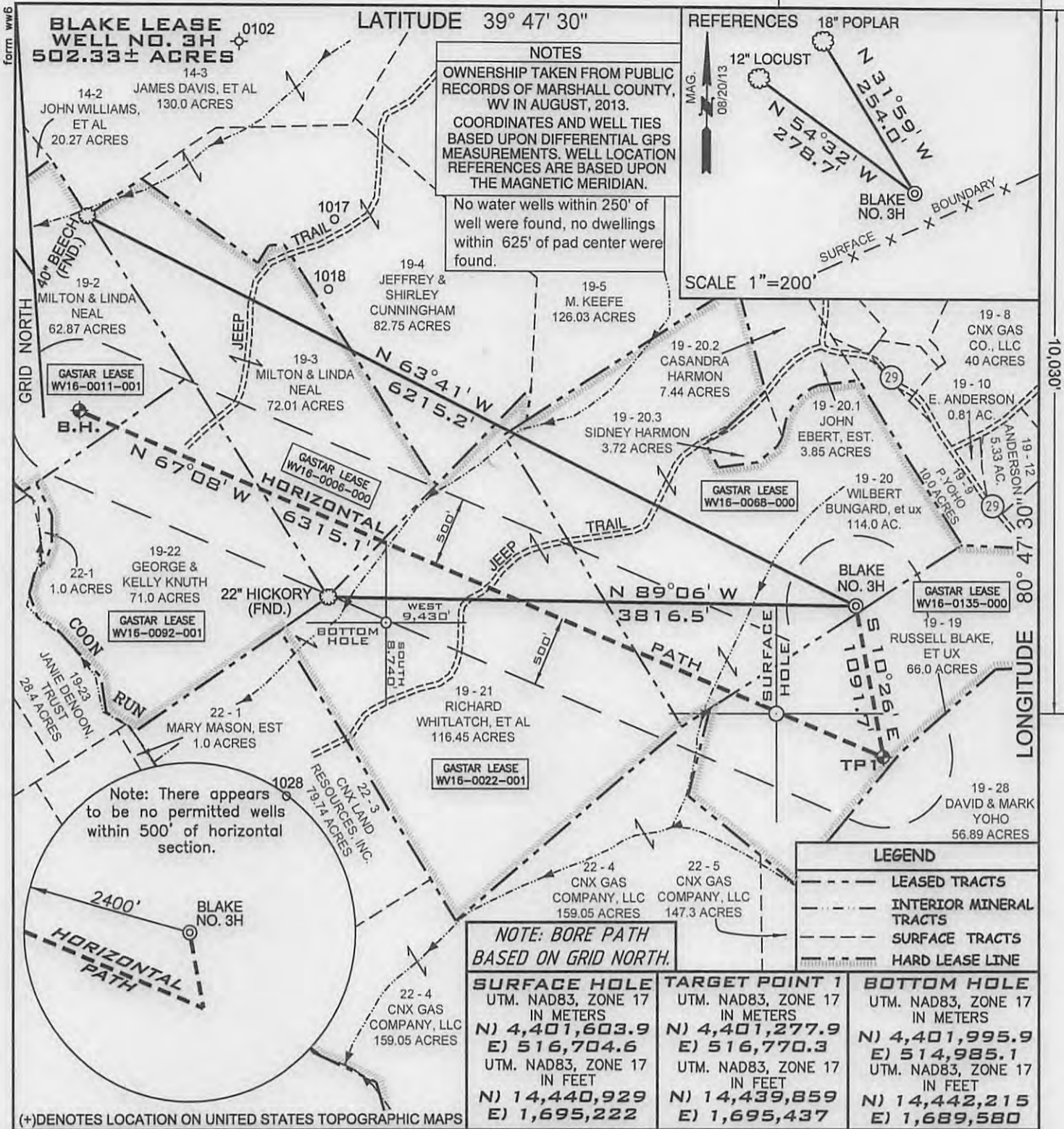
051 01698

SUPPLEMENT PG 2

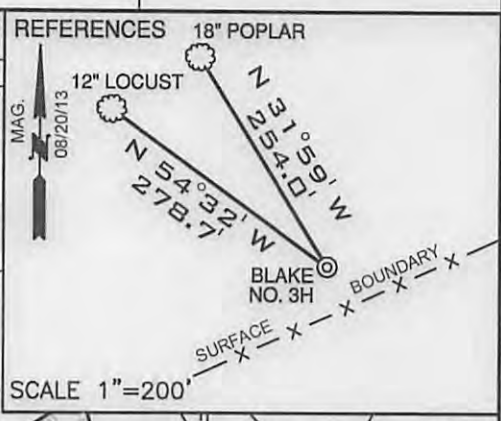


	<b>OPERATOR</b>	<b>TOPO SECTION</b>	<b>Office of Oil and Gas</b>
	GASTAR EXPLORATION USA, Inc. 229 W Main Street, Suite 301 Clarksburg, WV 26301	POWHATAN POINT 7.5'	<b>LEASE NAME</b> BLAKE 2 2013
<b>W0120321</b>		<b>SCALE:</b> 1"=2000'	<b>DATE:</b> DATE: 09/17/13

WV Department of  
Environmental Protection  
01/17/2014



**NOTES**  
 OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN AUGUST, 2013.  
 COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.  
 No water wells within 250' of well were found, no dwellings within 625' of pad center were found.



**LEGEND**

---	LEASED TRACTS
---	INTERIOR MINERAL TRACTS
---	SURFACE TRACTS
---	HARD LEASE LINE

**NOTE: BORE PATH BASED ON GRID NORTH.**

SURFACE HOLE	TARGET POINT 1	BOTTOM HOLE
UTM. NAD83, ZONE 17 IN METERS	UTM. NAD83, ZONE 17 IN METERS	UTM. NAD83, ZONE 17 IN METERS
N) 4,401,603.9	N) 4,401,277.9	N) 4,401,995.9
E) 516,704.6	E) 516,770.3	E) 514,985.1
UTM. NAD83, ZONE 17 IN FEET	UTM. NAD83, ZONE 17 IN FEET	UTM. NAD83, ZONE 17 IN FEET
N) 14,440,929	N) 14,439,859	N) 14,442,215
E) 1,695,222	E) 1,695,437	E) 1,689,580

FILE NUMBER W0120321 (WB1-70)

DRAWING NUMBER BLAKE\_WP\_3H

SCALE 1" = 1000'

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

P.S. 2122 *Jonathan N. White*



WVDEP  
 OFFICE OF OIL & GAS  
 601 57TH STREET  
 CHARLESTON, WV 25304

DATE: AUGUST 23, 2013

OPERATORS WELL NO. BLAKE NO. 3H

API WELL NO. \_\_\_\_\_

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

STATE 47 COUNTY 051 PERMIT 0169846A

LOCATION ELEVATION 1326' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER (UNDEFINED)

DISTRICT FRANKLIN COUNTY MARSHALL

QUADRANGLE POWHATAN POINT 7.5' LEASE NUMBER WV16-0022-001, WV16-0092-001, WV16-0011-001, WV16-0135-000, WV16-0068-000, WV16-0008-000

SURFACE OWNER WIBERT H. BUNGARD, ET UX ACREAGE 114.0

OIL & GAS ROYALTY OWNER RUSSELL BLAKE, ET AL LEASE ACREAGE 502.33

PROPOSED WORK: DRILL X CONVERT \_\_\_ DRILL DEEPER \_\_\_ REDRILL \_\_\_ FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION \_\_\_  
 PERFORATE NEW FORMATION \_\_\_ OTHER PHYSICAL CHANGE (SPECIFY) \_\_\_\_\_

TARGET FORMATION MARCELLUS PLUG & ABANDON \_\_\_ CLEAN OUT & REPLUG \_\_\_

ESTIMATED DEPTH 6511' + Horizontal Leg

WELL OPERATOR GASTAR EXPLORATION USA, INC. DESIGNATED AGENT MICHAEL McCOWN

ADDRESS 229 W MAIN STREET, SUITE 301 ADDRESS 229 W MAIN STREET, SUITE 301  
CLARKSBURG WV, 26301 CLARKSBURG WV, 26301

01/17/2014

COUNTY NAME  
 PERMIT