

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

API 47 - 51 - 01766 County Marshall District Franklin
Quad Powhatan Point 7.5' Pad Name Blake Field/Pool Name _____
Farm name Russel Blake Well Number U-7H
Operator (as registered with the OOG) Gastar Exploration Inc.
Address 229 West Main Street Suite 301 City Clarksburg State WV Zip 26301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey
Top hole Northing 4401564.2 Easting 516689.0
Landing Point of Curve Northing 4401600.4 Easting 516572.4
Bottom Hole Northing 4402354.1 Easting 514707.7

Elevation (ft) 1326' GL Type of Well New Existing Type of Report Interim Final
Permit Type Deviated Horizontal Horizontal 6A Vertical Depth Type Deep Shallow
Type of Operation Convert Deepen Drill Plug Back Redrilling Rework Stimulate
Well Type Brine Disposal CBM Gas Oil Secondary Recovery Solution Mining Storage Other _____
Type of Completion Single Multiple Fluids Produced Brine Gas NGL Oil Other _____
Drilled with Cable Rotary

Drilling Media Surface hole Air Mud Fresh Water Intermediate hole Air Mud Fresh Water Brine
Production hole Air Mud Fresh Water Brine
Mud Type(s) and Additive(s)
Synthetic Oil Base Mud

Date permit issued July 30, 2014 Date drilling commenced 8/14/2014 Date drilling ceased 12/19/2014
Date completion activities began 3/9/2015 Date completion activities ceased 6/6/2015
Verbal plugging (Y/N) _____ Date permission granted _____ Granted by _____

Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

Freshwater depth(s) ft 60' Open mine(s) (Y/N) depths None
Salt water depth(s) ft 1418' Void(s) encountered (Y/N) depths None
Coal depth(s) ft 970'-980' & 1175'-1205' Cavern(s) encountered (Y/N) depths None
Is coal being mined in area (Y/N) No

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Reviewed by:
JL 8/21/15
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API 47-51 - 01766 Farm name Russel Blake Well number U-7H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade w/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor							
Surface	30"	26"	120'	New	PE / 85.68 #/ft		Yes
Coal	24"	20"	1190'	New	J-55 / 106.5 #/ft	80'	Yes
Intermediate 1	17.5"	13.375"	2699'	New	J-55 / 61 #/ft	80'	Yes
Intermediate 2	12.25"	9.625"	9765'	New	P-110 / 43.5 #/ft		Yes
Intermediate 3							
Production	8.5"	5.5"	18096'	New	P-110 / 23 #/ft		No
Tubing							
Packer type and depth set							

Comment Details _____

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft ³ /sks)	Volume (ft ³)	Cement Top (MD)	WOC (hrs)
Conductor							
Surface	Class A	306	15.6	1.21	370	Surface	12
Coal	Class A	1133	15.6	1.19	1348	Surface	8
Intermediate 1	Class A	2115	15.6	1.19	2517	Surface	8
Intermediate 2	Class A	1782 / 543	13 / 15	1.99 / 1.33	3546 / 722	Surface	8
Intermediate 3							
Production	Class H	2514	15.6	1.19	3042	7505' (2260' inside 9 5/8")	8
Tubing							

Drillers TD (ft) 18,102' Loggers TD (ft) N/A
 Deepest formation penetrated Ulica Plug back to (ft) _____
 Plug back procedure _____

Kick off depth (ft) 9400'

Check all wireline logs run caliper density deviated/directional induction
 neutron resistivity gamma ray temperature sonic

Well cored Yes No Conventional Sidewall Were cuttings collected Yes No

DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING _____
 Surface/Coal Casing - 3 Centralizers at 300' spacing
 Intermediate Casing - 7 Centralizers at 300' Spacing
 2nd Intermediate Casing - 77 Centralizers, every third joint
 Production Casing - 247 Centralizers total - 1 centralizer every joint in the lateral and curve and 1 centralizer every third joint in the vertical section

WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

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Farm name Russel Blake

Well number U-7H

PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
SEE ATTACHED PERF INFO SHEET					

Please insert additional pages as applicable.

STIMULATION INFORMATION PER STAGE

Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Nitrogen/other (units)
			See Attached					

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Please insert additional pages as applicable.

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<u>PRODUCING FORMATION(S)</u>	<u>DEPTHS</u>	
<u>Point Pleasant</u>	<u>11,166' - 11,202'</u> TVD	<u>11,487' - 18,102'</u> MD
_____	_____	_____
_____	_____	_____

Please insert additional pages as applicable.

GAS TEST Build up Drawdown Open Flow OIL TEST Flow Pump
 SHUT-IN PRESSURE Surface 4601 psi Bottom Hole 9459 psi DURATION OF TEST 240 hrs

OPEN FLOW Gas 37957 mcfpd Oil 0 bpd NGL _____ bpd Water 817 bpd GAS MEASURED BY Estimated Orifice Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H ₂ S, ETC)
	<u>0</u>		<u>0</u>		SEE ATTACHED

Please insert additional pages as applicable.

Drilling Contractor Nomac Drilling
 Address 171 Locust Ave. City Mt. Morris State PA Zip 15349

Logging Company Baker Hughes
 Address 370 Westec Drive City Mt. Pleasant State PA Zip 15666

Cementing Company Baker Hughes
 Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Stimulating Company Baker Hughes
 Address 837 Philippi Pike City Clarksburg State WV Zip 26301

Please insert additional pages as applicable.

Completed by Thomas Rowan Telephone 304-622-4796
 Signature [Signature] Title Drilling and Completions Engineer Date 7-29-15

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

51-01766

Blake #U-7H Perforation Information

<u>Stage</u>	<u>Date</u>	<u>Perforated interval</u>		<u>Number of Perfs</u>	<u>Formation</u>
		<u>From</u> ft	<u>To</u> ft		
1	3/10/2015	18039	17837	48	Utica
2	3/25/2015	17787	17635	48	Utica
3	3/26/2015	17587	17435	48	Utica
4	3/30/2015	17387	17235	48	Utica
5	3/31/2015	17187	17035	48	Utica
6	3/31/2015	16987	16835	48	Utica
7	4/1/2015	16787	16635	48	Utica
8	4/1/2015	16587	16435	48	Utica
9	4/2/2015	16389	16235	48	Utica
10	4/2/2015	16187	16035	48	Utica
11	4/3/2015	15987	15835	48	Utica
12	4/3/2015	15787	15635	48	Utica
13	4/3/2015	15587	15435	48	Utica
14	4/4/2015	15387	15235	48	Utica
15	4/4/2015	15187	15040	48	Utica
16	4/4/2015	14987	14835	48	Utica
17	4/5/2015	14787	14635	48	Utica
18, 18 (2)	4/5/2015	14587	14435	48	Utica
19	4/6/2015	14387	14235	48	Utica
20	4/6/2015	14187	14035	48	Utica
21	4/7/2015	13987	13835	48	Utica
22	4/7/2015	13787	13635	48	Utica
23	4/7/2015	13587	13435	48	Utica
24	4/8/2015	13387	13235	48	Utica
25	4/8/2015	13187	13035	48	Utica
26	4/8/2015	12987	12835	48	Utica
27	4/9/2015	12787	12640	48	Utica
28	4/9/2015	12587	12435	48	Utica
29	4/9/2015	12387	12235	48	Utica
30	<u>4/10/2015</u>	12187	12035	48	Utica
31	4/10/2015	11987	11835	48	Utica
32	4/10/2015	11787	11635	48	Utica
33	4/12/2015	11587	11435	48	Utica
34	4/18/2015	11387	11235	48	Utica

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Fluid & Sand Volume Summary - Blake #U-7H

<u>Stage</u>	<u>Stimulation Date</u>	<u>Avg Pump Rate (BPM)</u>	<u>Avg Pressure (PSI)</u>	<u>Max Break Pres. (PSI)</u>	<u>ISIP (PSI)</u>	<u>Sand Total (lbs)</u>	<u>Total Water (bbls)</u>
1	3/25/2015	74	10,641	20	8,422	459,801	7858
2	3/25/2015	75	11,190	10,972	10,895	459,999	8855
3	3/26/2015	73	11,082	9,800	8,111	422,529	9255
4	3/31/2015	75	10,667	11,306	7,916	445,581	9906
5	3/31/2015	77	10,941	10,548	7,884	451,219	10395
6	4/1/2015	77	10,900	11,328	7,865	451,994	10214
7	4/1/2015	75	11,254	11,393	7,475	449,069	10100
8	4/1/2015	77	10,879	10,260	7,698	450,620	9963
9	4/2/2015	73	10,940	9,846	7,833	449,164	10031
10	4/2/2015	77	10,826	9,872	7,804	452,009	10078
11	4/3/2015	78	9,680	9,082	7,803	454,937	10075
12	4/3/2015	74	10,644	10,370	7,711	435,799	10114
13	4/3/2015	78	10,904	10,122	7,822	440,435	10541
14	4/4/2015	73	10,232	9,842	7,778	446,933	10012
15	4/4/2015	76	10,426	10,188	7,840	447,386	10179
16	4/4/2015	77	10,491	10,352	7,826	448,269	9930
17	4/5/2015	75	10,559	11,952	7,833	449,107	9997
18	4/5/2015	77	10,320	10,591	8,455	188,397	7641
18 (2)	4/6/2015	77	10,712	N/A	8,056	287,257	7331
19	4/6/2015	78	10,622	N/A	8,117	449,355	10284
20	4/6/2015	78	11,001	10,122	7,868	452,285	9984
21	4/7/2015	75	10,981	11,290	8,111	448,132	9868
22	4/7/2015	78	10,488	10,107	8,104	447,700	11581
23	4/7/2015	78	10,625	11,080	7,993	446,998	9777
24	4/8/2015	74	10,068	9,598	7,972	437,624	9778
25	4/8/2015	77	10,039	9,257	7,887	445,793	9892
26	4/8/2015	77	10,542	11,500	7,863	445964	9766
27	42103	77	10297	10580	7197	447649	9818
28	42103	76	10184	10732	7972	447114	9779
29	42103	78	9816	9812	7722	448884	9692
30	42104	77	9827	10166	7611	442136	9766
31	42104	79	10040	9283	7833	459059	9969
32	42104	74	10365	9875	7611	357850	11038
33	42106	75	10344	11205	7778	379399	9136
34	42112	69	11322	10812	8211	199523	8058

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Formations	Top TVD	Base TVD	Top MD	Base MD
SHALE	0	970	0	970
SEWICKLEY COAL	970	980	970	980
SHALE	980	1175	980	1175
PITTSBURGE COAL	1175	1205	1175	1205
SHALE AND SANDSTONE	1205	1418	1205	1418
3RD SALT SAND	1418	1473	1418	1473
SHALE	1473	1560	1473	1560
MAXTON	1560	1902	1560	1902
SHALE	1902	1982	1902	1982
BIG LIME	1982	2060	1982	2060
BIG INJUN	2060	2260	2060	2260
WEIR SILTSTONE	2260	2520	2260	2520
BEREA SILTSTONE	2520	2720	2520	2720
SAND AND SHALE	2720	2820	2720	2820
GORDON	2820	2850	2820	2850
SHALE	2850	3463	2850	3463
BRAILLER	3463	5337	3463	5337
PIPE CREEK SHALE	5337	5537	5337	5537
SHALE	5537	5962	5537	5962
RHINESTREET	5962	6242	5962	6242
CASHAQUA	6242	6370	6242	6370
MIDDLESEX	6370	6395	6370	6395
WEST RIVER	6395	6448	6395	6448
GENESEO	6448	6474	6448	6474
TULLY LIMESTONE	6474	6500	6474	6500
HAMILTON	6500	6533	6500	6533
MARCELLUS	6533	6583	6533	6583
ONONDOGA	6583	6808	6583	6808
ORISKANY	6808	6859	6808	6859
HELDERBERG	6859	7125	6859	7126
BASS ISLAND	7125	7273	7126	7274
SALINA	7273	8317	7274	8318
LOCKPORT	8317	8696	8318	8697
ROSE HILL	8696	9078	8697	9079
CLINTON	9078	9131	9079	9132
TUSCARORA	9131	9459	9132	9460
QUEENSTON	9459	10114	9460	10119
REEDSVILLE	10114	11063	10119	11178
UTICA	11063	11166	11178	11487
POINT PLEASANT	11166	na	11487	na
TRENTON	na	na	na	na

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(Note: Clicking the FracFocus, FIND A WELL links will open a new window.)

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Note: This window expires with 10 minutes of inactivity. After that you will be taken back to the dashboard.

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Hydraulic Fracturing Data

[Edit](#)

Job Start Date 3/25/2015	Job End Date 4/18/2015	API Number 47-051-01766-00-00	State & County West Virginia --- Marshall
Well Name BLAKE UNIT U-7H			
Longitude -80.82846	Latitude 39.77089	Datum NAD27	Federal/Tribal Well?
True Vertical Depth (ft) 11462	Total Water Vol (gal) 13994022	Total Non Water Vol 0	Total Mass (lbs) 132614516.5222



MSDS Chemical Ingredients

[New Additive](#) [Select Additive](#) [Add Additive](#)

	Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass
Edit	Water	Operator	Carrier	Water	7732-18-5	100%	87.2565033%		116679356.6316
Edit	Sand, White, 30/50	Baker Hughes	Proppant	MSDS and Non-MSDS Ingredients Listed Below	N/A	0%	8.7615%		11619138
Edit	TerraProp Plus, 30/50 mesh (bulk)	Baker Hughes	Proppant	MSDS and Non-MSDS Ingredients Listed Below	N/A	0%	2.06528%		2738863
Edit	HCl, 10.1 - 15%	Baker Hughes	Acidizing	MSDS and Non-MSDS Ingredients Listed Below	N/A	0%	.507876%	SmartCare Product	673518.16
Edit	Sand, White, 100 mesh	Baker Hughes	Proppant	MSDS and Non-MSDS Ingredients Listed Below	N/A	0%	.32128%		426065
Edit	MaxPerm-20A, 265 gallon tote	Baker Hughes	Friction Reducer	MSDS and Non-MSDS Ingredients Listed Below	N/A	0%	.294718%	SmartCare Product	390839.31
Edit	Scaletrol 720, 330 gl tote	Baker Hughes	Scale Inhibitor	MSDS and Non-MSDS Ingredients Listed Below	N/A	0%	.0249144%	SmartCare Product	33040.1934

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<input type="button" value="Edit"/>	GBW-5	Baker Hughes	Breaker	MSDS and Non-MSDS Ingredients Listed Below	N/A	0%	.0232893%	SmartCare Product	30885
<input type="button" value="Edit"/>	Alpha 1427	Baker Hughes	Biocide	MSDS and Non-MSDS Ingredients Listed Below	N/A	0%	.0126748%	SmartCare Product	16808.75
<input type="button" value="Edit"/>	Ferrotrol 300L	Baker Hughes	Iron Control	MSDS and Non-MSDS Ingredients Listed Below	N/A	0%	.0034856%	SmartCare Product	4622.4772
<input type="button" value="Edit"/>	CI-39	Baker Hughes	Corrosion Inhibitor	MSDS and Non-MSDS Ingredients Listed Below	N/A	0%	.0010406%		1380

Non-MSDS Chemical Ingredients

Trade Name	Supplier	Purpose	Ingredients	CAS #	% High Additive	% HF Job	Comments	Ingredient Mass
<input type="button" value="Edit"/> Ingredients in Additive(s) (MSDS and non-MSDS)	Baker Hughes	See Trade Name(s) List						
			Crystalline Silica (Quartz)	14808-60-7	100%	9.0077827%		12045203
			Aluminum Oxide	1344-28-1	100%	2.0482081%		2738863
			Water	7732-18-5	85%	.6252029%		836021.0073
			Amorphous Silica	7631-86-9	20%	.4096416%		547772.6
			1-Propanesulfonic acid, 2-methyl-2-[(1-oxo-2-propen-1-yl)amino]-, polymer with 2-propenamido, sodium salt	83446-68-8	60%	.1753692%		234503.586
			Titanium Dioxide	13463-67-7	5%	.1024104%		136943.15
			Iron Oxide	1309-37-1	5%	.1024104%		136943.15
			Hydrotreated Light Distillate	64742-47-8	30%	.0876846%		117251.793
			Hydrochloric Acid	7647-01-0	15%	.0755517%		101027.724
			Ammonium Persulphate	7727-54-0	100%	.0230968%		30885
			Sodium Chloride	7647-14-5	5%	.0148612%		19872.367434
			Sorbitan, mono-(9Z)-9-octadecenoate	1338-43-8	5%	.0146141%		19541.9655
			Oxyalkylated alcohol	78330-21-9	5%	.0146141%		19541.9655
			Polyoxyethylene sorbitan monooleate	9005-65-6	5%	.0146141%		19541.9655
			Ethylene Glycol	107-21-1	45%	.0111188%		14868.08703
			2-Propenoic, Polymer with Sodium Phosphinate, Sodium Salt	71050-62-9	20%	.0049417%		6608.03868
			Glutaraldehyde	111-30-8	30%	.003771%		5042.625
			Citric Acid	77-92-9	60%	.0020741%		2773.48632
			Didecyl Dimethyl Ammonium Chloride	7173-51-5	10%	.001257%		1680.875
			Calcium Chloride	10043-52-4	5%	.0012354%		1652.00967
			Quaternary Ammonium Compound	68424-85-1	5%	.0006801%		909.4325
			Ethanol	64-17-5	5%	.0006285%		840.4376
			Oxyalkylated Fatty Acid	61791-002	40%	.0004128%		592
			Formic Acid	64-18-6	30%	.0003096%		414

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Tar Bases, Quinoline Derivs., Benzyl Chloride- Quaternized	72480-70- 7	30%	.0003096%	414
Aldehyde	104-55-2	30%	.0003096%	414
Potassium Chloride	7447-40-7	1%	.0002471%	330.401934
Sulfurized polyolefin	68037-13- 8	5%	.0000516%	69
Isopropanol	67-63-0	5%	.0000516%	69
Potassium Iodide	7681-11-0	2%	.0000206%	27.6
Polyaklylene	7756-94-7	1%	.0000103%	13.8
Potassium Acetate	127-08-2	.5%	.0000052%	6.9

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Blake U-7H Cement and additives

Surface: Class A + 3% CaCl + 1/4 # per sack Flake

Coal: Class A + 1% CaCl + ¼ # per sack flake

Intermediate 1: Class A + 1% EC-1 + .5% SMS + .6% BA-10A + .25% R-3

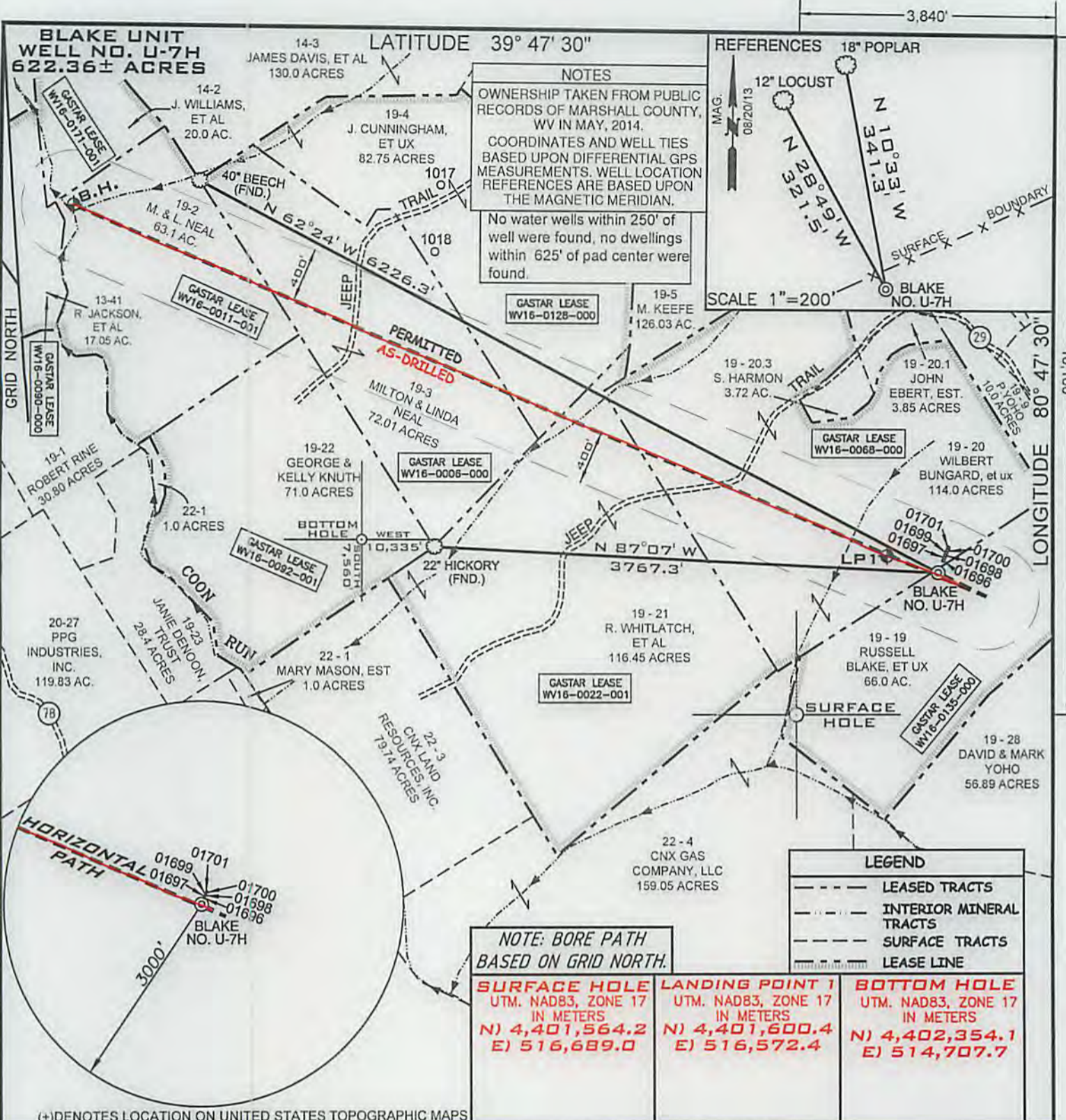
Intermediate 2: Lead: Class A + 5% BA-90 + .9% R-3 + 3% KCl + 1/8 # per sack flake + 1% MPA-170

Tail: Class A + .5% R-3 + 5% KCl + 1/8 # per sack flake + 1.4% FL-25 + .2% ASA-301 +.15% SMS

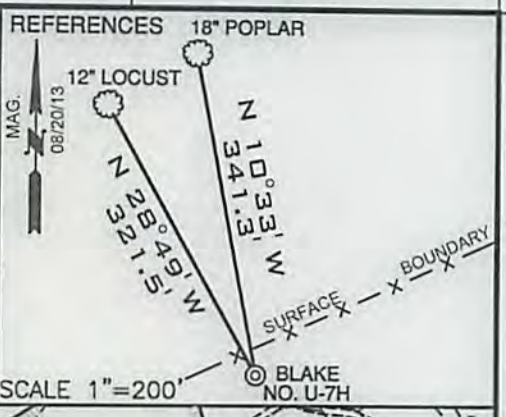
Production: Class H + .15% ASA-301 + .6% CD-32 + .7% FL-52 + .25% SMS

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NOTES
 OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN MAY, 2014.
 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
---	LEASE LINE

SURFACE HOLE UTM. NAD83, ZONE 17 IN METERS N) 4,401,564.2 E) 516,689.0	LANDING POINT 1 UTM. NAD83, ZONE 17 IN METERS N) 4,401,600.4 E) 516,572.4	BOTTOM HOLE UTM. NAD83, ZONE 17 IN METERS N) 4,402,354.1 E) 514,707.7
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FILE NUMBER W0120321 (WB1-70)
 DRAWING NUMBER BLAKE_WP_U-7H-WR35
 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. Jonathan N. White
 2122



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

DATE: JULY 28, 2015

OPERATORS WELL NO. BLAKE NO. U-7H AS-DRILLED
 API WELL NO. 47-051-01766

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
 LOCATION ELEVATION 1325' WATERSHED (HUC 10) FRENCH CREEK - OHIO RIVER (UNDEFINED)

DISTRICT FRANKLIN COUNTY MARSHALL
 QUADRANGLE POWHATAN POINT 7.5'

SURFACE OWNER RUSSELL BLAKE, ET AL ACREAGE 66.0
 OIL & GAS ROYALTY OWNER RUSSELL BLAKE, ET AL LEASE ACREAGE 622.36
 LEASE NUMBER WV16-0011-001, WV16-0090-000, WV16-0171-001, WV16-0022-001, WV16-0092-001, WV16-0068-000, WV16-0135-000, WV16-0068-000, WV16-0128-000

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

TARGET FORMATION POINT PLEASANT ESTIMATED DEPTH TVD:11,202' TMD: 18,102'

WELL OPERATOR GASTAR EXPLORATION INC. DESIGNATED AGENT MICHAEL McCOWN
 ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301 ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301

COUNTY NAME MARSHALL
 PERMIT 10380/2015