

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

API 47 - 51 - 01731 County Marshall District Franklin
Quad New Martinsville 7.5' Pad Name Simms Field/Pool Name _____
Farm name Simms, Terry E. & Deborah L. Well Number Simms U-5H
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 4,399,588.3 Easting 519,682.6
Landing Point of Curve Northing 4,399,850.0 Easting 520,007.6
Bottom Hole Northing 4,399,417.2 Easting 521,245.7

Elevation (ft) 1220' 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 2/28/2014 Date drilling commenced 4/04/2014 Date drilling ceased 7/4/2014
Date completion activities began 7/23/2014 Date completion activities ceased 9/10/2014
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 1600' Void(s) encountered (Y/N) depths None
Coal depth(s) ft 838' & 991' Cavern(s) encountered (Y/N) depths None
Is coal being mined in area (Y/N) No

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9/10/2014
WV Department of
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Reviewed by:
A.L. 5/19/15
W.S. 6/12/15
06/12/2015

API 47-51 - 01731 Farm name Simms, Terry E. & Deborah L. Well number Simms U-5H

CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/ N) * Provide details below*
Conductor	30"	26"	108'	New	PE / 54.5 #/ft		Yes
Surface	24"	20"	1185'	New	J-55 / 106 #/ft	84'	Yes
Coal	24"	20"	1185'	New	J-55 / 106 #/ft	84'	Yes
Intermediate 1	17.5"	13.375"	2760'	New	J-55 / 61 #/ft	83'	Yes
Intermediate 2	12.25"	9.625"	10,346'	New	HCP-110 / 47 #/ft	7170' / 9750'	Yes
Intermediate 3							
Production	8.5"	5.5"	16,804'	New	P-110 / 23 #/ft		Yes
Tubing		2.875"	10,363'	New	P-110/6.5#		
Packer type and depth set		10,400'					

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	Class A	297	15.6	1.19	353	Surface	12
Surface	Type 1	835	15.2	1.26	1052	Surface	8
Coal	Type 1	835	15.2	1.26	1052	Surface	8
Intermediate 1	Type 1	845	15	1.29	1090	Surface	8
Intermediate 2							
Intermediate 3							
Production	50:50 Class H / 50:50 Type 1	1315 / 1882	14.5 / 14.5	1.18	3772	Surface	
Tubing							

Drillers TD (ft) 11,492' TVD Loggers TD (ft) 11,487'

Deepest formation penetrated Trenton Plug back to (ft) 10,322'

Plug back procedure Run open ended tubing to 11,444'. Pump 455 sacks (1122' of fill) of class H cement as a balanced plug. Pull tubing slowly to approximately 9822' and circulate. Top of cement calculated at 10,322'

Kick off depth (ft) 10,400"

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
Intermediate Casing - 53 Centralizers every 5 joints.
Production Casing - 188 Centralizers total - 1 centralizer every joint in the lateral and curve and 1 centralizer every third joint in the vertical section

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WAS WELL COMPLETED AS SHOT HOLE Yes No DETAILS _____

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WAS WELL COMPLETED OPEN HOLE? Yes No DETAILS _____

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

Simms U-5H Perforation Information

Stage	Date	Perforated interval		Number of Perfs	Formation
		From	To		
		ft	ft		
1	7/17/2014	16710	16586	48	Utica/Point Pleasant
2	7/24/2014	16540	16403	48	Utica/Point Pleasant
3	7/25/2014	16360	16223	48	Utica/Point Pleasant
4	7/26/2014	16180	16043	48	Utica/Point Pleasant
5	7/27/2014	16000	15863	48	Utica/Point Pleasant
6	7/28/2014	15820	15684	48	Utica/Point Pleasant
7	7/28/2014	15633	15503	48	Utica/Point Pleasant
8	7/29/2014	15460	15323	48	Utica/Point Pleasant
9	7/29/2014	15272	15143	48	Utica/Point Pleasant
10	7/29/2014	15100	14963	48	Utica/Point Pleasant
11	7/30/2014	14920	14783	48	Utica/Point Pleasant
12	7/30/2014	14740	14603	48	Utica/Point Pleasant
13	7/30/2014	14560	14423	48	Utica/Point Pleasant
14	7/31/2014	14380	14243	48	Utica/Point Pleasant
15	7/31/2014	14200	14063	48	Utica/Point Pleasant
16	7/31/2014	14020	13883	48	Utica/Point Pleasant
17	8/1/2014	13840	13703	48	Utica/Point Pleasant
18	8/1/2014	13660	13526	48	Utica/Point Pleasant
19	8/1/2014	13480	13343	48	Utica/Point Pleasant
20	8/2/2014	13300	13163	48	Utica/Point Pleasant
21	8/2/2014	13120	12983	48	Utica/Point Pleasant
22	8/3/2014	12940	12803	48	Utica/Point Pleasant
23	8/3/2014	12760	12623	48	Utica/Point Pleasant
24	8/3/2014	12580	12443	48	Utica/Point Pleasant
25	8/4/2014	12400	12263	48	Utica/Point Pleasant

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Hydraulic Fracturing Fluid Product Component Information Disclosure

Last Fracture Date:	8/4/2014
State:	West Virginia
County:	Marshall
API Number:	47-051-01731-0000
Operator Name:	Gastar Expl Usa Inc
Well Name and Number:	Simms Unit U-5H
Longitude:	-80.75222
Latitude:	39.74437
Long/Lat Projection:	
Production Type:	Gas
True Vertical Depth (TVD):	11,460
Total Water Volume (gal):	10,146,234

Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Operator	Carrier	Water	7732-18-5	1.00%	0.88059%	
HCl, 5.1 - 7.5%	Baker Hughes	Acidizing	Hydrochloric Acid	7647-01-0	0.08%	0.00036%	SmartCare Product
Alpha 1427	Baker Hughes	Biocide	Didecyl Dimethyl Ammonium Chloride	7173-51-5	0.10%	0.00002%	SmartCare Product
			Ethanol	64-17-5	0.05%	0.00001%	
			Glutaraldehyde	111-30-8	0.30%	0.00005%	
			Quaternary Ammonium Compound	68424-85-1	0.05%	0.00001%	
GBW-5	Baker Hughes	Breaker	Ammonium Persulphate	7727-54-0	1.00%	0.00017%	SmartCare Product
CI-14	Baker Hughes	Corrosion Inhibitor	Fatty Acids	Trade Secret	0.10%	0.00000%	SmartCare Product
			Methanol	67-56-1	1.00%	0.00000%	
			Olefin	Trade Secret	0.05%	0.00000%	
			Polyoxyalkylenes	Trade Secret	0.30%	0.00000%	
			Propargyl Alcohol	107-19-7	0.05%	0.00000%	
MaxPerm-20A, 265 gallon tote	Baker Hughes	Friction Reducer	1-Propanesulfonic acid, 2-methyl-2-[(1-oxo-2-propen-1-ylamino)- polymer	Trade Secret	0.60%	0.00140%	SmartCare Product
			Hydrotreated Light Distillate	64742-47-8	0.30%	0.00070%	
			Oxyalkylated alcohol	Trade Secret	0.05%	0.00012%	
			Sodium Chloride	7647-14-5	0.05%	0.00012%	
			Water	7732-18-5	0.60%	0.00042%	
Ferrotrol 300L	Baker Hughes	Iron Control	Citric Acid	77-92-9	0.60%	0.00001%	SmartCare Product
Sand, White, 40/70	Baker Hughes	Proppant	Crystalline Silica (Quartz)	14808-60-7	1.00%	0.10617%	
Sand, White, 100 mesh	Baker Hughes	Proppant	Crystalline Silica (Quartz)	14808-60-7	1.00%	0.00270%	
Super LC, 30/50	Baker Hughes	Proppant	Hexamethylenetetramine	100-97-0	0.00%	0.00000%	
			P/F Resin	9003-35-4	0.05%	0.00006%	
			Silicon Dioxide (Silica Sand)	14808-60-7	0.97%	0.00117%	
Scaletrol 720, 330 gl tote	Baker Hughes	Scale Inhibitor	Calcium Chloride	10043-52-4	0.05%	0.00001%	SmartCare Product
			Ethylene Glycol	107-21-1	0.45%	0.00006%	
Ingredients shown above are subject to 29 CFR 1910.1200(i) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
			2-Propenoic, Polymer with Sodium Phosphinate, Sodium Salt	71050-62-9		0.0000249524%	
			Formaldehyde	50-00-0		0.0000004009%	
			Hydrochloric Acid	7647-01-0		0.0000004009%	
			Modified Thiourea Polymer	68527-49-1		0.0000028009%	
			Polyoxyethylene sorbitan monooleate	9005-65-6		0.0001169082%	
			Potassium Chloride	7447-40-7		0.0000012476%	
			Sodium Chloride	7647-14-5		0.0000012476%	
			Sorbitan, mono-(9Z)-9-octadecenoate	1338-43-8		0.0001169082%	
			Water	7732-18-5		0.0055787886%	

* Total Water Volume sources may include fresh water, produced water, and/or recycled water

** Information is based on the maximum potential for concentration and thus the total may be over 100%

All component information listed was obtained from the supplier's Material Safety Data Sheets (MSDS). As such, the Operator is not responsible for inaccurate and/or incomplete information. Any questions regarding the content of the MSDS should be directed to the supplier who provided it. The Occupational Safety and Health Administration's (OSHA) regulations govern the criteria for the disclosure of information. Please note that Federal Law protects "proprietary", "trade secret", and "confidential business information" and the criteria for how this information is reported on an MSDS is subject to 29 CFR 1910.1200(i) and Appendix D.

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Formations	Top TVD	Base TVD	Top MD	Base MD
SHALE	0	838	0	838
SEWICKLEY COAL	838	858	838	858
SHALE	858	991	858	991
PITTSBURGE COAL	991	1001	991	1001
SHALE AND SANDSTONE	1001	1873	1001	1873
3RD SALT SAND	1873	1928	1873	1928
SHALE	1928	2015	1928	2015
MAXTON	2015	2065	2015	2065
SHALE	2065	2066	2065	2066
BIG LIME	2066	2104	2066	2104
BIG INJUN	2104	2394	2104	2394
WEIR SILTSTONE	2394	2586	2394	2586
BEREA SILTSTONE	2586	2678	2586	2678
SAND AND SHALE	2678	2828	2678	2828
GORDON	2828	2868	2828	2868
SHALE	2868	3648	2868	3650
WARREN SANDSTONE	3648	3678	3650	3681
BRAILLER	3678	5141	3681	5144
JAVA SHALE	5141	5288	5144	5291
PIPE CREEK SHALE	5288	5488	5291	5491
SHALE	5488	5909	5491	5912
RHINESTREET	5909	6221	5912	6224
CASHAQUA	6221	6320	6224	6323
MIDDLESEX	6320	6342	6323	6345
WEST RIVER	6342	6399	6345	6402
GENESEO	6399	6417	6402	6420
TULLY LIMESTONE	6417	6462	6420	6465
HAMILTON	6462	6514	6465	6517
MARCELLUS	6514	6562	6517	6565
ONONDOGA	6562	6794	6565	6797
HUNTERSVILLE	6794	6813	6797	6816
ORISKANY	6813	6871	6816	6874
HELDERBERG	6871	7125	6874	7128
BASS ISLAND	7125	7272	7128	7276
SALINA	7272	8333	7276	8339
LOCKPORT	8333	8735	8339	8741
ROSE HILL	8735	9089	8741	9095
CLINTON	9089	9157	9095	9163
TUSCARORA	9157	9412	9163	9418
QUEENSTON	9412	10166	9418	10172
REEDSVILLE	10166	11215	10172	11221
UTICA	11215	11290	11221	11296
POINT PLEASANT	11290	11406	11296	11412
TRENTON	11406	na	11412	na



February 26, 2015

WVDEP-Office of Oil & Gas
Attn: Justin Nottingham
601 57th Street SE
Charleston, WV 25304

VIA: USPS

Re: Simms U-5H WR-35 (API # 051-01731)

Dear Justin:

Enclosed herein for your review and further handling, please find the above referenced WR-35 for the Simms U-5H well situated in Marshall County.

If you have any questions or need additional information, please feel free to contact me at 304/966-0362.

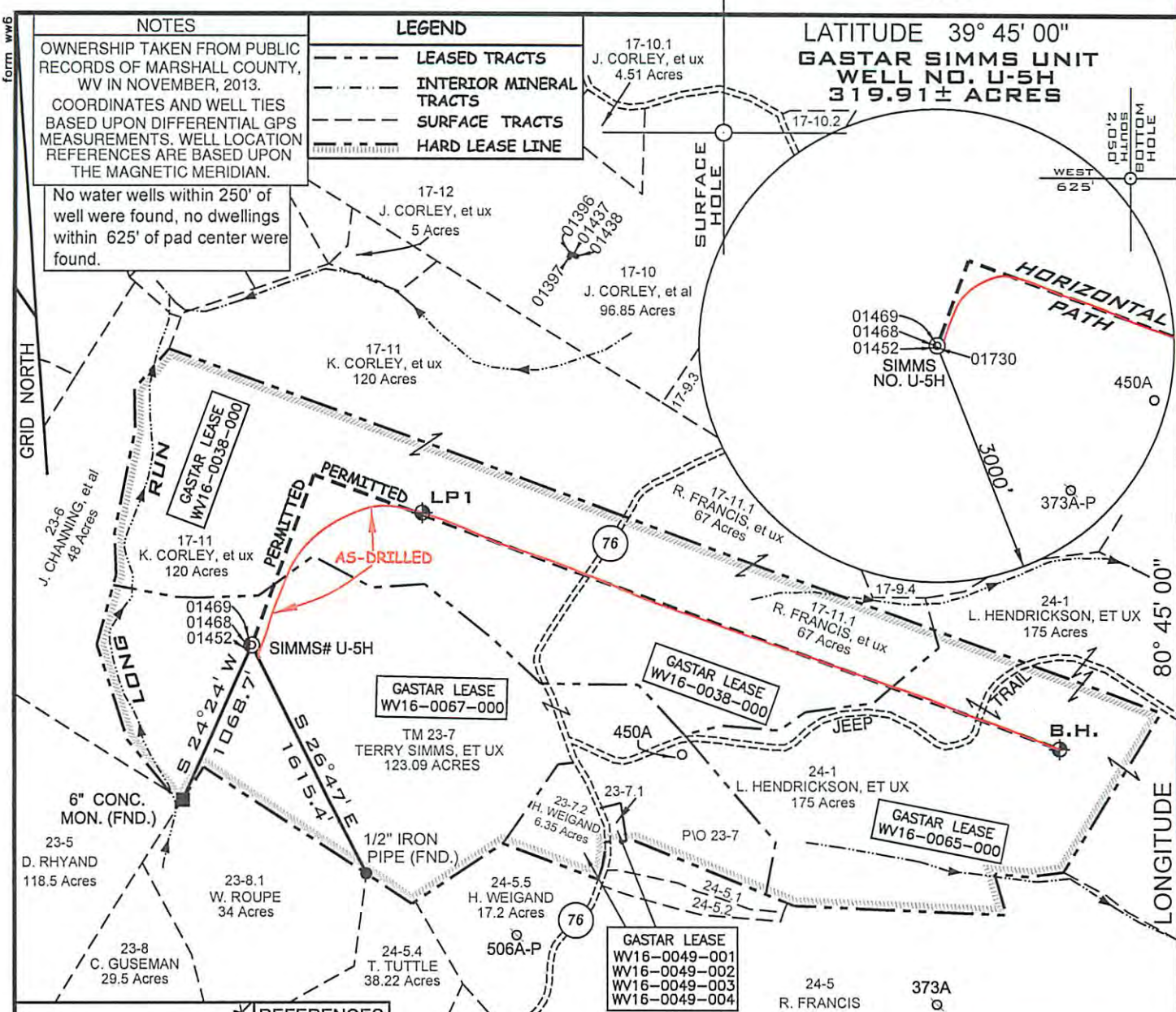
Sincerely,

A handwritten signature in blue ink, appearing to read "Dave Perkinson".

DAVE PERKINSON
Landman

Gastar Exploration LTD.
229 West Main Street, Suite 301 · Clarksburg, WV 26301
Phone: (304) 622-4796 · Fax: (304) 622-4824

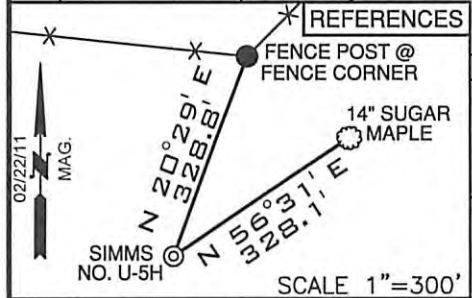
06/12/2015



NOTES
 OWNERSHIP TAKEN FROM PUBLIC RECORDS OF MARSHALL COUNTY, WV IN NOVEMBER, 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

LATITUDE 39° 45' 00"
GASTAR SIMMS UNIT
WELL NO. U-5H
319.91± ACRES



SURFACE HOLE UTM. NAD83, ZONE 17 IN METERS N) 4,399,588.3 E) 519,682.6	LANDING POINT 1 UTM. NAD83, ZONE 17 IN METERS N) 4,399,850.0 E) 520,007.6	BOTTOM HOLE UTM. NAD83, ZONE 17 IN METERS N) 4,399,417.2 E) 521,245.7
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NOTE: BORE PATH BASED ON GRID NORTH.

FILE NUMBER W0110295 (WB5-54)
 DRAWING NUMBER SIMMS_U-5H_WP_AD
 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: JANUARY 09, 2015
 OPERATORS WELL NO. SIMMS NO. U-5H AS-DRILLED

WELL TYPE: OIL GAS LIQUID INJECTION WASTE DISPOSAL
 (IF "GAS") PRODUCTION STORAGE DEEP SHALLOW
 LOCATION ELEVATION 1220' WATERSHED (HUC 10) FISH CREEK - (UNDEFINED)

DISTRICT FRANKLIN COUNTY MARSHALL
 QUADRANGLE NEW MARTINSVILLE 7.5' LEASE NUMBER WV16-0067-000, WV16-0049-003, WV16-049-004, WV16-0065-000, WV16-038-000, WV16-0049-001, WV16-0049-002

SURFACE OWNER TERRY E. & DEBORAH SIMMS ACREAGE 123.09
 OIL & GAS ROYALTY OWNER TERRY E. & DEBORAH L. SIMMS, ET AL LEASE ACREAGE 319.91
 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: 11,487' TMD: 16,804'

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

08/12/2015

COUNTY NAME
 PERMIT