



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 10, 2014

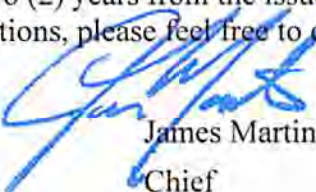
WELL WORK PERMIT
Horizontal 6A Well

This permit, API Well Number: 47-10302982, 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: 1H
Farm Name: M.B. INVESTMENTS
API Well Number: 47-10302982
Permit Type: Horizontal 6A Well
Date Issued: 06/10/2014

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.

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

1) Well Operator: Gastar Exploration USA, Inc. 494487685 Wetzel Magnolia Porters Falls
Operator ID County District Quadrangle

103 6 554

2) Operator's Well Number: 1H Well Pad Name: Lackawanna

3) Farm Name/Surface Owner: Wetzel County Sanitary Landfill Public Road Access: County Route 30

4) Elevation, current ground: 1319' Elevation, proposed post-construction: 1302'

5) Well Type (a) Gas Oil Underground Storage
Other

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No No

DMH
2-20-14

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
The Marcellus is the target formation at a depth of 6829' (top of formation), an anticipated thickness of 46' and a pressure of approx. 3200 psi.

8) Proposed Total Vertical Depth: 6975'

9) Formation at Total Vertical Depth: Onondaga

10) Proposed Total Measured Depth: 13,377'

11) Proposed Horizontal Leg Length: 6050'

12) Approximate Fresh Water Strata Depths: Shallowest at 70' & deepest at 1225'.

13) Method to Determine Fresh Water Depths: Noticeable flow at flowline or when needed to start soaping

14) Approximate Saltwater Depths: 1740'

15) Approximate Coal Seam Depths: Sewickley at 1079' and Pittsburgh at 1220'

16) Approximate Depth to Possible Void (coal mine, karst, other): None Anticipated

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	PE	54.5 #/ft		40'	241 ft ³ (CTS)
Fresh Water	13 3/8"	New	H-40	48 #/ft		1275'	885 ft ³ (CTS)
Coal	13 3/8"	New	H-40	48 #/ft		1275'	885 ft ³ (CTS)
Intermediate	9 5/8"	New	J-55	36 #/ft		2650	901 ft ³ (CTS)
Production	5 1/2"	New	P-110	20 #/ft		13,377'	3553 ft ³ (CTS)
Tubing	2 3/8"	New	N-80	4.7 #/ft		6970'	N/A
Liners							

*DWH
2-20-14*

TYPE	Size	Wellbore Diameter	Wall Thickness	Burst Pressure	Cement Type	Cement Yield (cu. ft./k)
Conductor	20"	26"	.25"	880 psi	Class A	1.2
Fresh Water	13 3/8"	17.5"	.33"	1730 psi	Class A	1.2
Coal	13 3/8"	17.5"	.33"	1730 psi	Class A	1.2
Intermediate	9 5/8"	12.25"	.352"	3520 psi	Class A	1.2
Production	5.5"	8.875" & 8.75"	.361"	12,640 psi	Class H	1.18
Tubing						
Liners						

PACKERS

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

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WV Department of
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WW-6B
(9/13)

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 from approximately 60 degrees back to surface, 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 8000 bbls of water and 325,000 lbs of sand per stage. There will be approximately 31 stages.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 25.45

22) Area to be disturbed for well pad only, less access road (acres): 4.01

23) Describe centralizer placement for each casing string:

Gastar will run 3 centralizers on the surface casing at an equal distance. 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 vertical section.

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

Class A + 2% CaCl₂ + 1/4# Flake - Surface Cement mixed at 15.6 ppg. CaCl₂ (calcium chloride), Flake (cellophane flake)
Class A + 1% CaCl₂ + 1/4# Flake - Intermediate Cement mixed at 15.6 ppg. 50:50 Class H .2%CD32 1.2%FL62 .1% ASA301 .4%SMS - Long String Lead mixed 14.5 ppg. CD32 (cement dispersant), FL 62 (fluid loss), SMS (sodium metasilicate), ASA (minimizes free fluid). 50:50 TYPE 1 .4% R3 1%FL62 .15%ASA301 .3%CD32-Long String Tail-14.5ppg

25) Proposed borehole conditioning procedures:

Gastar will circulate the hole a minimum 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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2-20-14
WV Department of
Environmental Protection

*Note: Attach additional sheets as needed.

4710302982

Lackawanna 1H
Wetzel County, WV

20" 54.5# PE @ 40'

3 Centralizers @ Even Spacing

13 3/8" 48# H-40 ST&C
Set @ 1275' MD

Wellbore 12.25"

7 Centralizers @ 300' Spacing

9 5/8" 36# J-55
Set @ 2,650' MD

8 7/8" wellbore

*Dm4
2-20-14*

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WV Department of
Environmental Protection
MAR 11 2014
Pilot Hole @ 6,975' TVD

LP @ 7,327' MD
6,850' TVD

One Centralizer every other jt from toe to bot of the curve and
one Centralizer every joint in the curve and one centr. Every other
joint in ther vertical section.

5 1/2" 20# P-110

Ret @ 13,377' MD





GASTAR EXPLORATION USA, INC.

Location: Wetzel County, WV
 Field: Wetzel
 Facility: Lackawanna Unit Pad

Slot: Slot #1
 Well: Lackawanna Unit 1H
 Wellbore: Lackawanna Unit 1H (PWB)



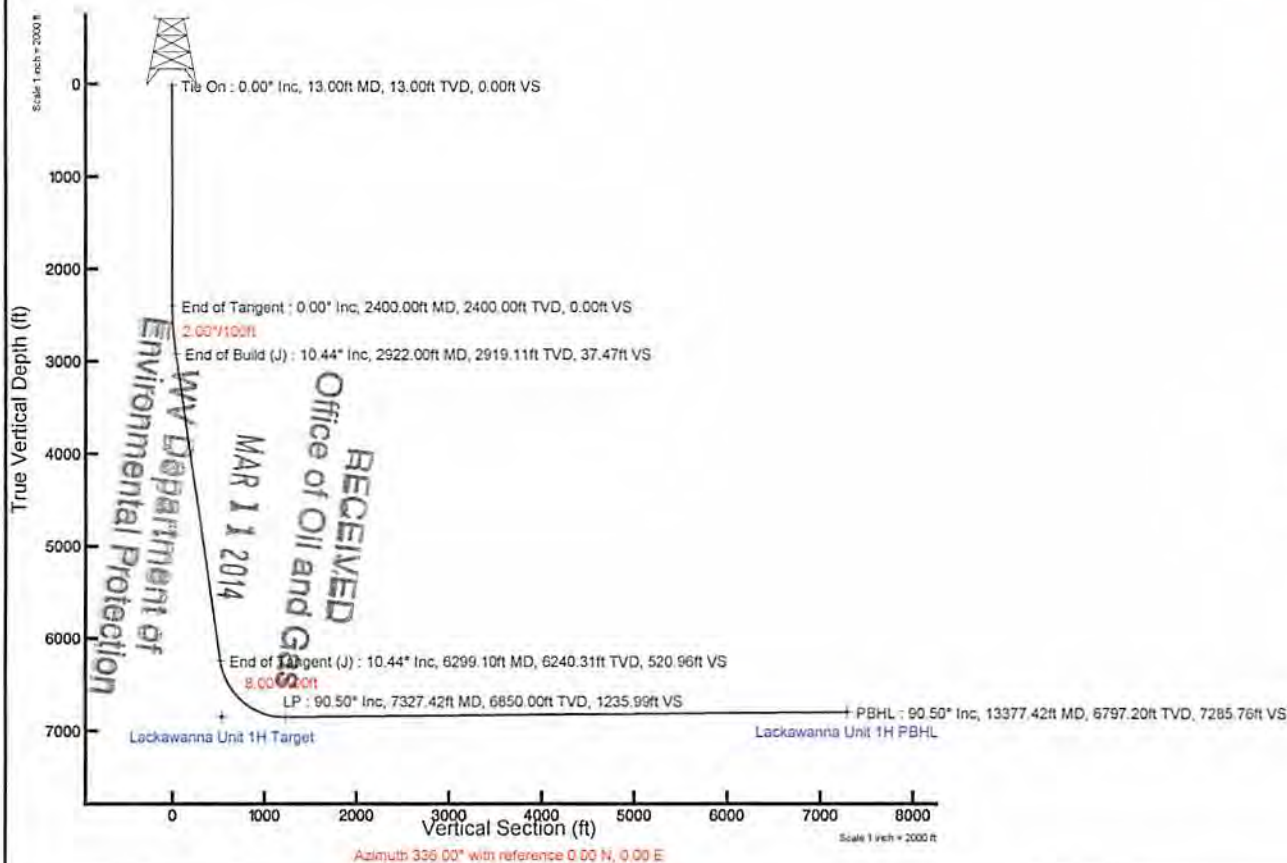
Location Information

Facility Name	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude		
Lackawanna Unit Pad	1680777.720	14383374.840	39°36'22.348"N	80°51'24.118"W		
Slot	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Slot #1	0.00	0.00	1680777.720	14383374.840	39°36'22.348"N	80°51'24.118"W

Rig on Slot #1 (RT) to Mud line (At Slot: Slot #1)	13ft
Mean Sea Level to Mud line (At Slot: Slot #1)	-1302ft
Rig on Slot #1 (RT) to Mean Sea Level	1315ft

Well Profile Data

Design Comment	MD (ft)	Inc (")	Az (°)	TVD (ft)	Local N (ft)	Local E (ft)	DLS (*/100ft)	VS (ft)
Tie On	13.00	0.000	13.807	13.00	0.00	0.00	0.00	0.00
End of Tangent	2400.00	0.000	13.807	2400.00	0.00	0.00	0.00	0.00
End of Build (J)	2922.00	10.440	13.807	2919.11	46.05	11.32	2.00	37.47
End of Tangent (J)	6299.10	10.440	13.807	6240.31	640.32	157.36	0.00	520.96
LP	7327.42	90.500	336.000	6850.00	1321.79	-70.00	8.00	1235.99
PBHL	13377.42	90.500	336.000	6797.20	6848.53	-2530.66	0.00	7285.76

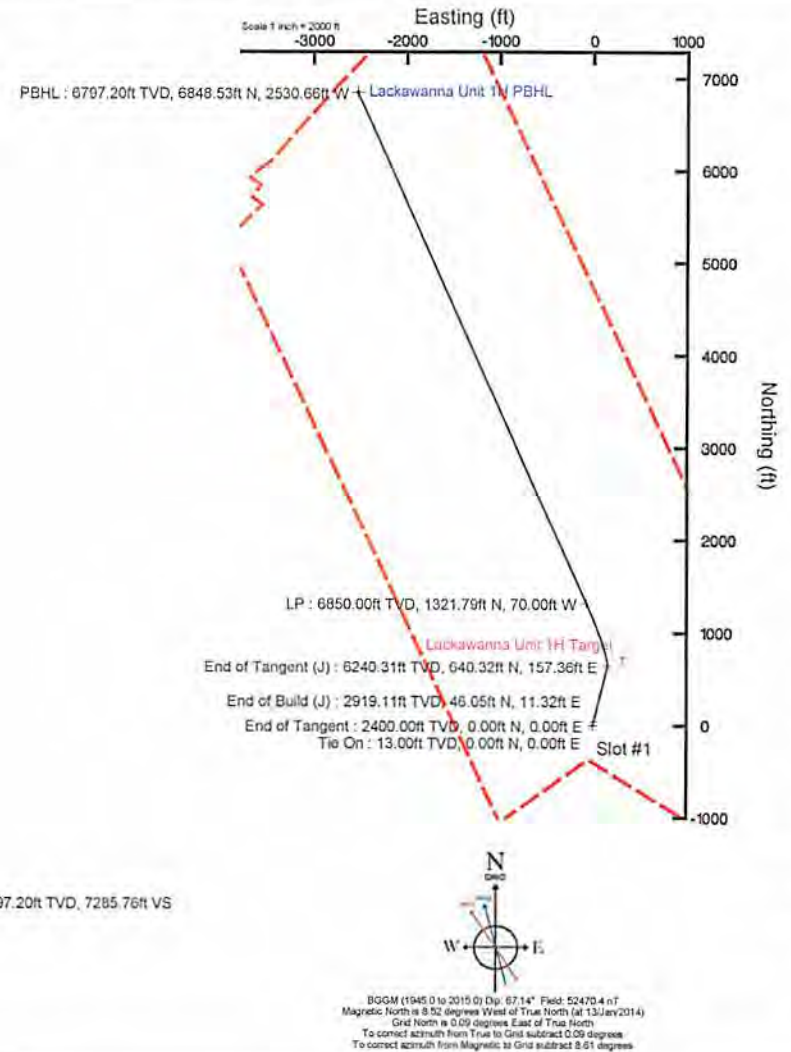


Targets

Name	MD (ft)	TVD (ft)	Local N (ft)	Local E (ft)	Grid East (US ft)	Grid North (US ft)	Latitude	Longitude
Lackawanna Unit 1H PBHL	13377.42	6797.20	6848.53	-2530.66	1678248.07	14380220.63	39°37'30.070"N	80°51'56.320"W
Lackawanna Unit 1H Target	6850.00	727.90	727.90	317.63	1681095.22	14384102.45	39°36'29.530"N	80°51'20.045"W

Plot reference wellpath is Lackawanna Unit 1H EX-00

True vertical depths are referenced to Rig on Slot #1 (RT)	Grid System: NAD83 / UTM Zone 17 North, US feet
Measured depths are referenced to Rig on Slot #1 (RT)	North Reference: Grid north
Rig on Slot #1 (RT) to Mean Sea Level: 1315 feet	Scale: True distance
Mean Sea Level to Mud line (At Slot: Slot #1): -1302 feet	Depths are in feet
Coordinates are in feet referenced to Slot	Created by: frjjesl on 15/Jan/2014



4740302982

WW-9
(9/13)

API Number 47 - _____ - 4710302982
Operator's Well No. 1H _____

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) Outlet Middle Island Creek (Undefined) Quadrangle Porters Falls 7.5'

Elevation 1302' County Wetzel District Magnolia

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 DMH 2-20-14

If so, please describe anticipated pit waste: Fresh water for frac and flow back water

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 UIC 359; UIC 2D0732540; UIC 2D0732523)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain _____)

DMH
2-20-14

Will closed loop system be used? If so, describe: Yes, For Vertical and Horizontal Drilling

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

Note on Vertical *If a pocket of gas is hit. The gas flow will be diverted to the flare and SOBMs (that is previously prepared) will be pumped into the well to kill the well if necessary.

-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/WV0109185)

-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/WV0109185)

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

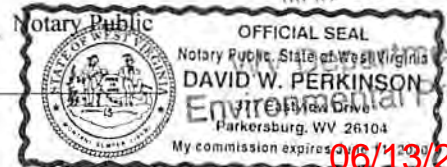
Company Official Title Senior VP & COO

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Office of Oil and Gas

Subscribed and sworn before me this 10th day of February, 20 14

David W. Perkinson

My commission expires 06/11/2020



MAR 11 2014

06/11/2014

47 10 3 0 2 9 8 2

Form WW-9

Operator's Well No. 1H

Gastar Exploration USA, Inc.

Proposed Revegetation Treatment: Acres Disturbed 25.45 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

Seed Type	lbs/acre
Fox Tail / Grassy	40

Perennial Rye	30
---------------	----

Crown Vetch	20
-------------	----

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: _____

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WV Department of
Environmental Protection

Title: Oil + Gas Inspector

Date: 2-20-14

Field Reviewed? () Yes () No

06/13/2014

WW-9

PROPOSED LACKAWANNA

SUPPLEMENT BG 1A
8710302982

WELL NO. 1H

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

Charles Clegg
Tax Map: 12
Parcel: 129

M.B. Investments
Tax Map: 12
Parcel: 109.1

sediment pond
sediment pond



MATCH LINE "A" (SEE PAGE 1B)
MATCH LINE "A" (SEE PAGE 1A)

227' @ 4-8% GRADE

609' @ 6-10% GRADE

Lackawanna Transport Co.
Tax Map: 12
Parcel: 122

205' @ 7-11% GRADE

Lackawanna Transport Co.
Tax Map: 12
Parcel: 130

WETZEL COUNTY LANDFILL PERMIT
#SWF 1021/WW109185

MB Investments
Tax Map: 17
Parcel: 2

254' @ 4-8% GRADE

1232' @ 5-10% GRADE

sediment pond

Lackawanna Transport Co.
Tax Map: 12
Parcel: 130

TRUCK WASH AREA

Lackawanna Transport Co.
Tax Map: 17
Parcel: 7.1

Jerry W. & Deloris Thompson
Tax Map: 17
Parcel: 6

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.

Office of Oil and Gas

WV Department of Environmental Protection

Drift 2-2014

HOUSE
SHED
GARAGE
SHED

HOUSE
GARAGE

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.

PEACH FORK

603' @ 2-6% GRADE

Lackawanna Transport Co.
Tax Map: 17
Parcel: 10.1

Note:
© - Denotes install 18" HDPE pipe and apply appropriate sediment outlet control (Rip Rap splash pad).

Ⓞ - Denotes existing culvert in place.

* * * Silt and Sediment and Erosion Control Measure.

DATE: 01/31/14

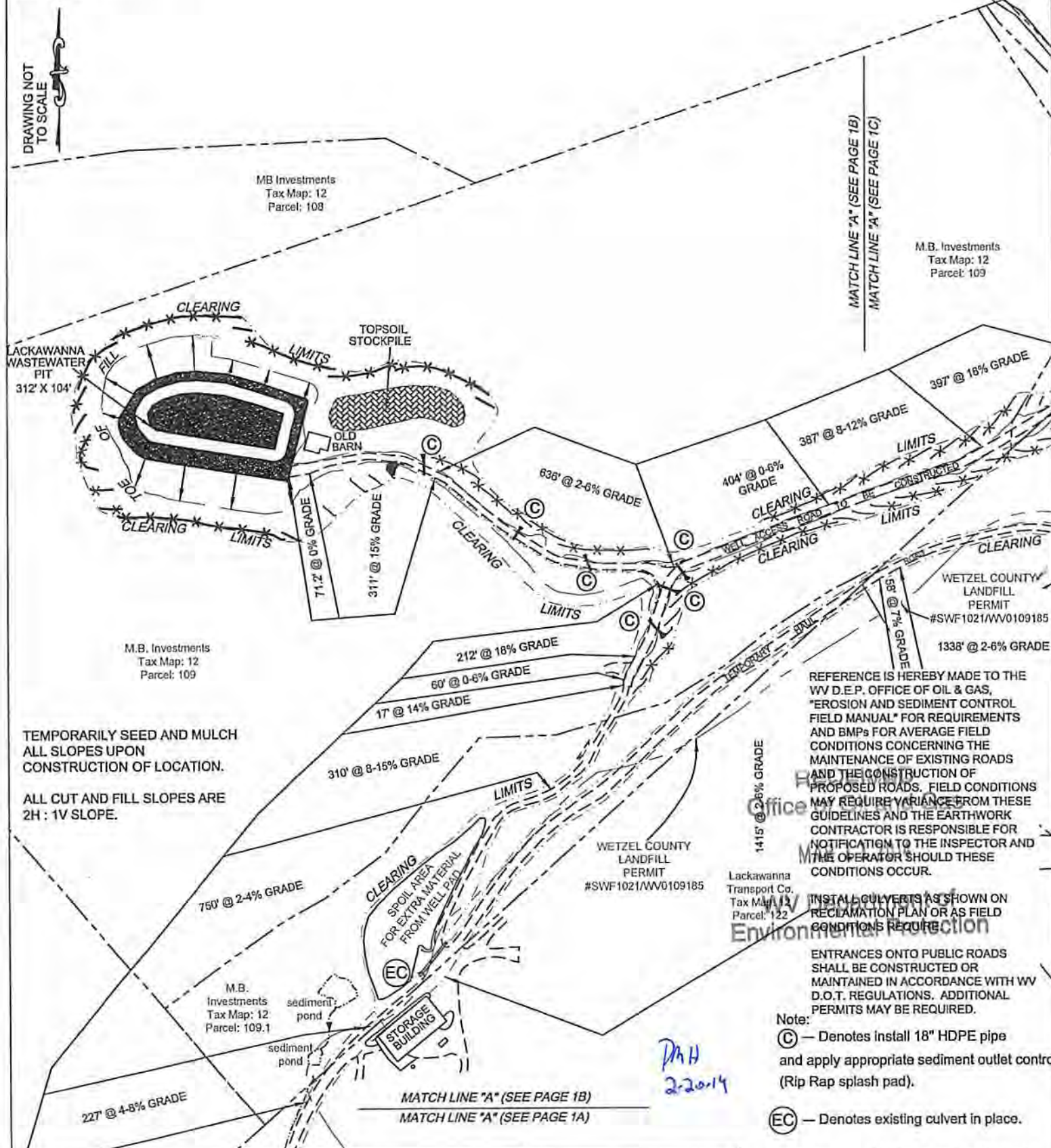
PROJECT NO: W0110309

DRAWN BY: J.N.W.

06/13/2014

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.

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

- Note:
- Ⓢ — Denotes install 18" HDPE pipe and apply appropriate sediment outlet control (Rip Rap splash pad).
 - Ⓜ — Denotes existing culvert in place.

DH
2-20-14

WELL NO. 1H

4710302982

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INSTALL CULVERTS AS SHOWN ON RECLAMATION PLAN 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: (C) Denotes install 18" HDPE pipe and apply appropriate sediment outlet control (Rip Rap splash pad). (EC) - Denotes existing culvert in place.

TEMPORARILY SEED AND MULCH ALL SLOPES UPON CONSTRUCTION OF LOCATION.

ALL CUT AND FILL SLOPES ARE 2H : 1V SLOPE.

DmH 2-2-14

Silt Control and Erosion Control Measure. 66/13/2014

47 103 029 82



global environmental solutions

Well Site Safety Plan

Gastar Exploration USA, Inc.

Well Name: Lackawanna 1H

Pad Location: Lackawanna Pad

Wetzel County, West Virginia

GPS Coordinates: Lat. $39^{\circ} 36'22.345''$
Long. $80^{\circ} 51'24.116''$

*DmH
2-20-14*

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SLR Ref: 116.01034.00005
WV Department of
Environmental Protection
February 2014

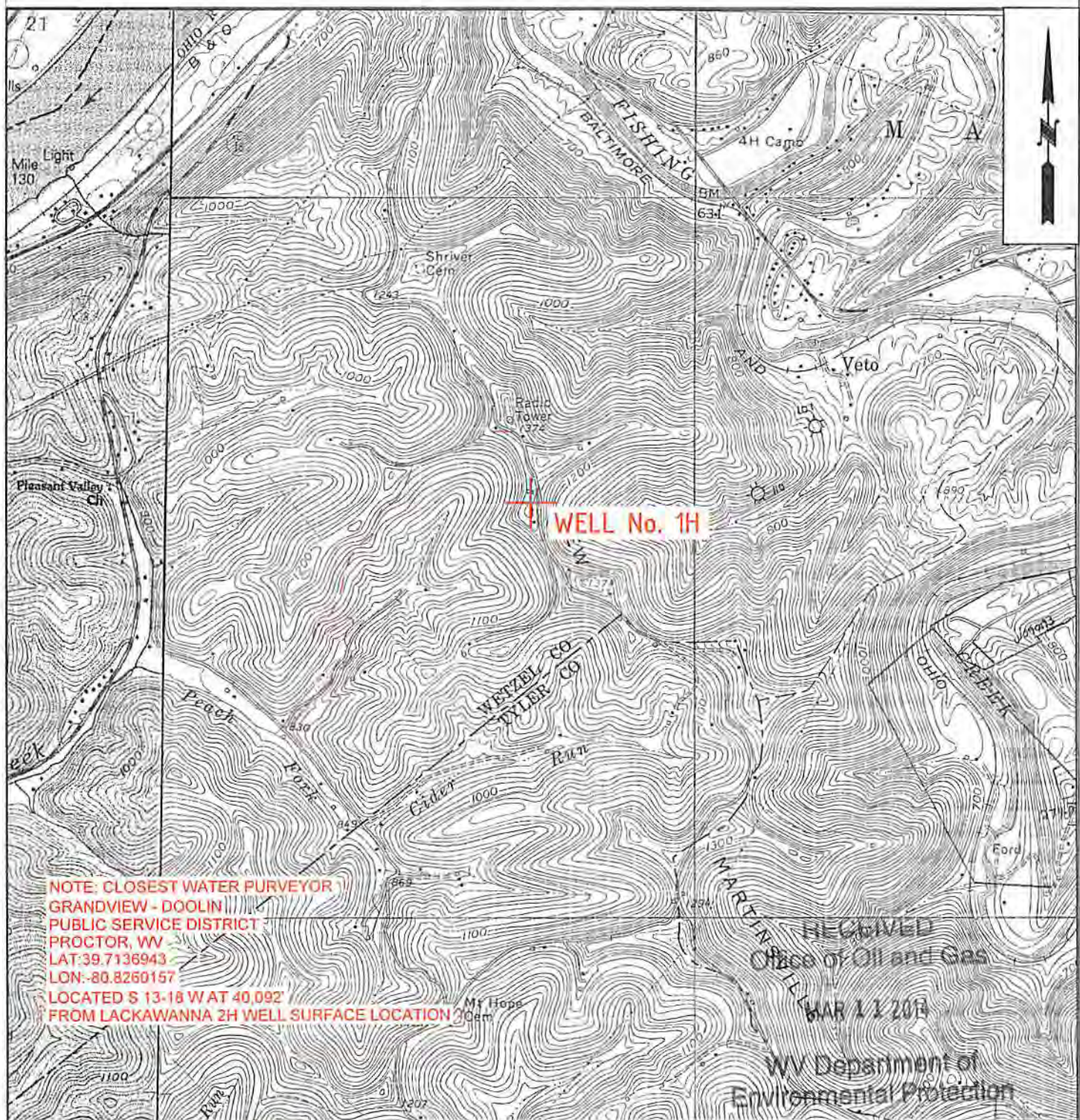
06/13/2014

WW-9

PROPOSED LACKAWANNA WELL No. 1H

47 10302982

SUPPLEMENT PG 2



NOTE: CLOSEST WATER PURVEYOR
 GRANDVIEW - DOOLIN
 PUBLIC SERVICE DISTRICT
 PROCTOR, WV
 LAT: 39.7136943
 LON: -80.8260157
 LOCATED S 13-18 W AT 40.092
 FROM LACKAWANNA 2H WELL SURFACE LOCATION

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 Office of Oil and Gas

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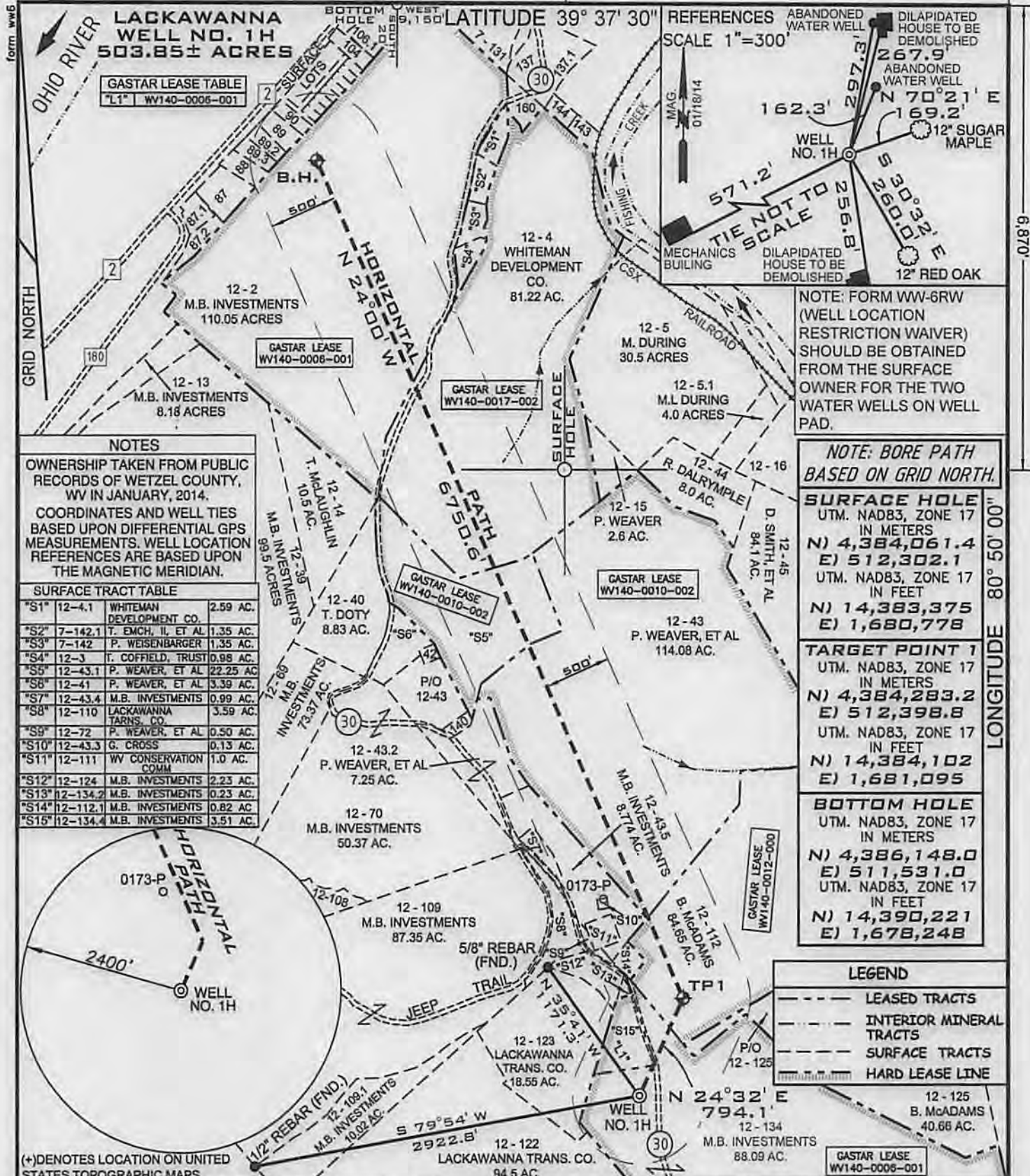
WV Department of
 Environmental Protection

*DmH
2-2014*

W0110309

OPERATOR	TOPO SECTION	LEASE NAME
GASTAR EXPLORATION USA, Inc. 229 W Main Street, Suite 301 Clarksburg, WV 26301	PORTERS FALLS 7.5'	LACKAWANNA
	SCALE:	DATE:
	1"=2000'	DATE: 01/27/14

06/13/2014



LACKAWANNA WELL NO. 1H
503.85± ACRES

GASTAR LEASE TABLE
"L1" WV140-0006-001

NOTES

OWNERSHIP TAKEN FROM PUBLIC RECORDS OF WETZEL COUNTY, WV IN JANUARY, 2014.
COORDINATES AND WELL TIES BASED UPON DIFFERENTIAL GPS MEASUREMENTS. WELL LOCATION REFERENCES ARE BASED UPON THE MAGNETIC MERIDIAN.

SURFACE TRACT TABLE

*S#	TRACT	OWNER	ACRES
*S1	12-4.1	WHITEMAN DEVELOPMENT CO.	2.59 AC.
*S2	7-142.1	T. EMCH, II, ET AL.	1.35 AC.
*S3	7-142	P. WEISENBARGER	1.35 AC.
*S4	12-3	T. COFFIELD, TRUST	0.98 AC.
*S5	12-43.1	P. WEAVER, ET AL.	22.25 AC.
*S6	12-41	P. WEAVER, ET AL.	3.39 AC.
*S7	12-43.4	M.B. INVESTMENTS	0.99 AC.
*S8	12-110	LACKAWANNA TRANS. CO.	3.59 AC.
*S9	12-72	P. WEAVER, ET AL.	0.50 AC.
*S10	12-43.3	G. CROSS	0.13 AC.
*S11	12-111	WV CONSERVATION COMM.	1.0 AC.
*S12	12-124	M.B. INVESTMENTS	2.23 AC.
*S13	12-134.2	M.B. INVESTMENTS	0.23 AC.
*S14	12-112.1	M.B. INVESTMENTS	0.82 AC.
*S15	12-134.4	M.B. INVESTMENTS	3.51 AC.

NOTE: FORM WW-6RW (WELL LOCATION RESTRICTION WAIVER) SHOULD BE OBTAINED FROM THE SURFACE OWNER FOR THE TWO WATER WELLS ON WELL PAD.

NOTE: BORE PATH BASED ON GRID NORTH.

SURFACE HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,384,061.4
E) 512,302.1
UTM. NAD83, ZONE 17
IN FEET
N) 14,383,375
E) 1,680,778

TARGET POINT 1
UTM. NAD83, ZONE 17
IN METERS
N) 4,384,283.2
E) 512,398.8
UTM. NAD83, ZONE 17
IN FEET
N) 14,384,102
E) 1,681,095

BOTTOM HOLE
UTM. NAD83, ZONE 17
IN METERS
N) 4,386,148.0
E) 511,531.0
UTM. NAD83, ZONE 17
IN FEET
N) 14,390,221
E) 1,678,248

LEGEND

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

(+) DENOTES LOCATION ON UNITED STATES TOPOGRAPHIC MAPS

FILE NUMBER W0110309
DRAWING NUMBER LACKAWANNA_WP_1H
SCALE 1" = 1000'
MINIMUM DEGREE OF ACCURACY 1/200
PROVEN SOURCE SUBMETER MAPPING
OF ELEVATION 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: JANUARY 27, 2014

OPERATORS WELL NO. LACKAWANNA NO. 1H
API WELL NO. 47-103-02982
STATE COUNTY PERMIT

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

LOCATION ELEVATION 1302' WATERSHED (HUC 10) MIDDLE ISLAND CREEK (UNDEFINED)
DISTRICT MAGNOLIA COUNTY WETZEL

QUADRANGLE PORTERS FALLS 7.5' LEASE NUMBER WV140-0017-002, WV140-0006-001, WV140-0012-000

SURFACE OWNER M.B. INVESTMENTS ACREAGE 88.09
OIL & GAS ROYALTY OWNER M.B. INVESTMENTS, ET AL LEASE ACREAGE 503.85

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

TARGET FORMATION MARCELLUS PLUG & ABANDON CLEAN OUT & REPLUG
WELL OPERATOR GASTAR EXPLORATION USA, INC. ESTIMATED DEPTH 6850' + Horizontal Leg
ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301 DESIGNATED AGENT MICHAEL McCOWN
ADDRESS 229 W MAIN STREET, SUITE 301 CLARKSBURG WV, 26301

06/13/2014