



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

September 05, 2014

WELL WORK PERMIT

Horizontal 6A Well

This permit, API Well Number: 47-10303026, issued to HG ENERGY, 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: MA MILLER 406 N-4H
Farm Name: DULANEY, DALE K.

API Well Number: 47-10303026

Permit Type: Horizontal 6A Well

Date Issued: 09/05/2014

Promoting a healthy environment.

09/05/2014

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

103 4 254

1) Well Operator: HG Energy, LLC 494497948 Wetzel Grant Big Run 7.5'
Operator ID County District Quadrangle

2) Operator's Well Number: MA Miller 406 N-4H Well Pad Name: MA Miller 406

3) Farm Name/Surface Owner: MA Miller Public Road Access: SLS 58

4) Elevation, current ground: 1385' Elevation, proposed post-construction: 1369'

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

(b) If Gas Shallow Deep
Horizontal

6) Existing Pad: Yes or No No

DM 4
6-3-14

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):
Marcellus, Approximate TVD 7230 feet, approximate thickness 50 feet, associated pressure gradient @ 1.1 psi/foot

8) Proposed Total Vertical Depth: 7230 TVD

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 17053 TMD

11) Proposed Horizontal Leg Length: 8008'

12) Approximate Fresh Water Strata Depths: 115

13) Method to Determine Fresh Water Depths: Based on drilling history in nearby wells

14) Approximate Saltwater Depths: 2175

15) Approximate Coal Seam Depths: 1265

16) Approximate Depth to Possible Void (coal mine, karst, other): NA

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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WV Dept. of Environmental Protection

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18)

CASING AND TUBING PROGRAM

TYPE	<u>Size</u>	<u>New or Used</u>	<u>Grade</u>	<u>Weight per ft. (lb/ft)</u>	<u>FOOTAGE: For Drilling</u>	<u>INTERVALS: Left in Well</u>	<u>CEMENT: Fill-up (Cu. Ft.)</u>
Conductor					60'	60'	NA (Drilled in)
Fresh Water					1319'	1319'	1400, CTS
Coal							
Intermediate					3500'	3500'	1550, CTS
Production					17053'	17053'	4225
Tubing					NA	8000'	NA
Liners							

DWH
6-3-14

TYPE	<u>Size</u>	<u>Wellbore Diameter</u>	<u>Wall Thickness</u>	<u>Burst Pressure</u>	<u>Cement Type</u>	<u>Cement Yield (cu. ft./k)</u>
Conductor	20"	20"	0.375"	1530#	NA	NA (Drilled in)
Fresh Water	13 3/8"	17 1/2"	0.38"	2740#	Class A	1.21
Coal	NA					
Intermediate	9 5/8"	12 1/4"	0.395"	3950#	Gas Block - Class A	Tail - 1.18 Lead - 1.29
Production	5 1/2"	8 1/2"	0.361"	12640#	50/50 - ASC	Tail - 1.5 Lead - 1.31
Tubing	2 3/8"	4.778"	0.19"	11200#	NA	NA
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:

Drill, case, cement and complete a horizontal Marcellus well.

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

Plan to hydraulically fracture/stimulate the well with "slickwater" frac technique. Will utilize a plug and perforation technique through cased hole.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 10.62

22) Area to be disturbed for well pad only, less access road (acres): 0.20

23) Describe centralizer placement for each casing string:

Conductor: NA
Surface: Centralizer every 3 joints or 120'
Intermediate: Centralizer every 3 joints or 120'
Production Centralizer Program: Run 1 spiral centralizer every 120'

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

✓ Conductor: NA - Drilled in (Casing while drilling, no annulus)
Surface: Premium NE-1 (Class A Cement) (see attachment for complete description)
Intermediate: Lead: Class A Cement / Tail: Class A Cement (see attachment for complete description)
Production: Lead: Class A (50/50) / Tail: Class A (ASC) (see attachment for complete description)

25) Proposed borehole conditioning procedures:

The wellbore will be properly circulated at TD of each section until as much of the residual drill cuttings have been removed from the wellbore as possible, residual drilling gas has been circulated out and until the mud and wellbore are both constant and stable. Mud properties will be adjusted if needed. Hole cleaning times may vary from well to well, hole section to hole section.

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*Note: Attach additional sheets as needed.

DMH
6-3-14

Cement Additives for WW-6B

Conductor: N/A – Drilled in / Sanded in (Casing While Drilling, no annulus)

Surface Casing:

Premium NE – 1 (Class A Cement) + 3% bwoc calcium
 Chloride + 0.75 gals/100 sack FP-12L (ANTI-FOAM) + 0.25
 Lbs/sack Cello Flake (Lost Circulation Material)

Intermediate Casing:

Lead:

Type 1 Cement + 0.75 gals/100 sack FP (ANTI-FOAM)
 12L + 0.25 lbs/sack Cello Flake (Lost Circulation)

Tail: Gas-Blok Blend

Premium NE-1 (Class A Cement) + 0.55% bwoc BA-10A (Bonding Agent) + 1% bwoc
 EC-1 (Bonding Agent) + 0.5% bwoc Sodium Metasilicate (Viscosifier) + 0.25 lbs/sack
 Cello Flake (Lost Circulation) + 0.75 gals/100 sack FP-12L (Anti-Foam)

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Office of Oil and Gas
 WV Dept. of Environmental ProtectionDMH
6-3-14Production:

Lead #1

(50:50) Poz (Fly Ash): Premium NE – 1 (Class A Cement) + 0.25% bwoc R-3 (Retarder) + 1% bwoc EC-1 (Bonding Agent)
 + 0.75 gals/100 0.25% bwoc R-3 (Retarder) + 1% bwoc EC-1 (Bonding Agent) + 0.75 gals/100 sack FP-12L (Anti-Foam) +
 0.125 lbs/sack Cello Flake (Lost Circulation) + 0.5% bwoc MPA-170 (Multi Purpose Additive), ie Fluid Loss, Free Water
 and Stabilization

Lead #2

676 sacks (50:50) Poz (Fly Ash): Premium NE-1 (Class A Cement) + 0.125 lbs/sack Cello Flake (Lost Circulation) + 0.3%
 bwoc CD-32 (Dispersant) + 0.4% bwoc BA-59 (Bonding Agent) + 0.5% bwoc MPA-170 (Multi Purpose Additive), sack +
 7.5 lbs/sack BA-90 (Bonding Agent) + 0.3% bwoc R-3 (Retarder) + 0.75 gals/100 sack FP-12L (Anti-Foam)

Lead #3

Premium NE-1 (Class A Cement) + 0.5% bwoc R-3 (Retarder) + 0.75 gals/100 sack FP-12L (Anti-foam) + 0.125 lbs/sack
 Cello Flake (Lost Circulation) + 0.25% bwoc CD-32 (Dispersant) + 0.6% bwoc Sodium Metasilicate (Viscosifier) + 1.2%
 bwoc BA-10A (Bonding Agent) + 10 lbs/sack ASCA-1 (Solubility Aid).

09/05/2014

103-03026

WELL: M.A. Miller 406 N - 4H

Horizontal Marcellus Casing Schematic

DRAWING NOT TO SCALE



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WV Dept. of Environmental Protection

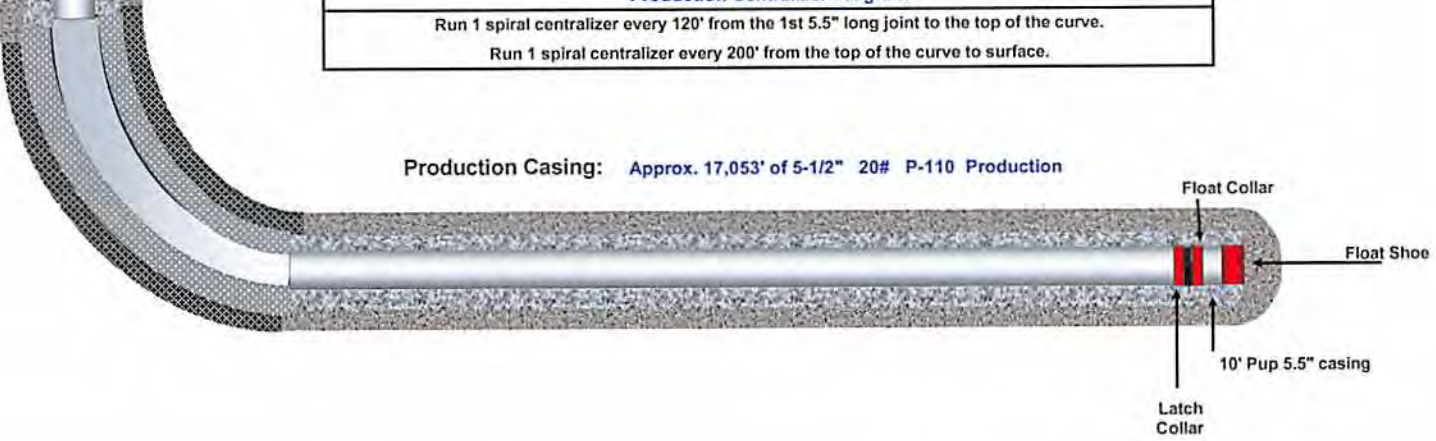
*DMH
6-3-14*

Production Centralizer Program

Run 1 spiral centralizer every 120' from the 1st 5.5" long joint to the top of the curve.

Run 1 spiral centralizer every 200' from the top of the curve to surface.

Production Casing: Approx. 17,053' of 5-1/2" 20# P-110 Production



103-03026

Reclamation Plan For:

Mary A. Miller 406

Wells N-1H, N-2H, N-3H N-4H & N-5H

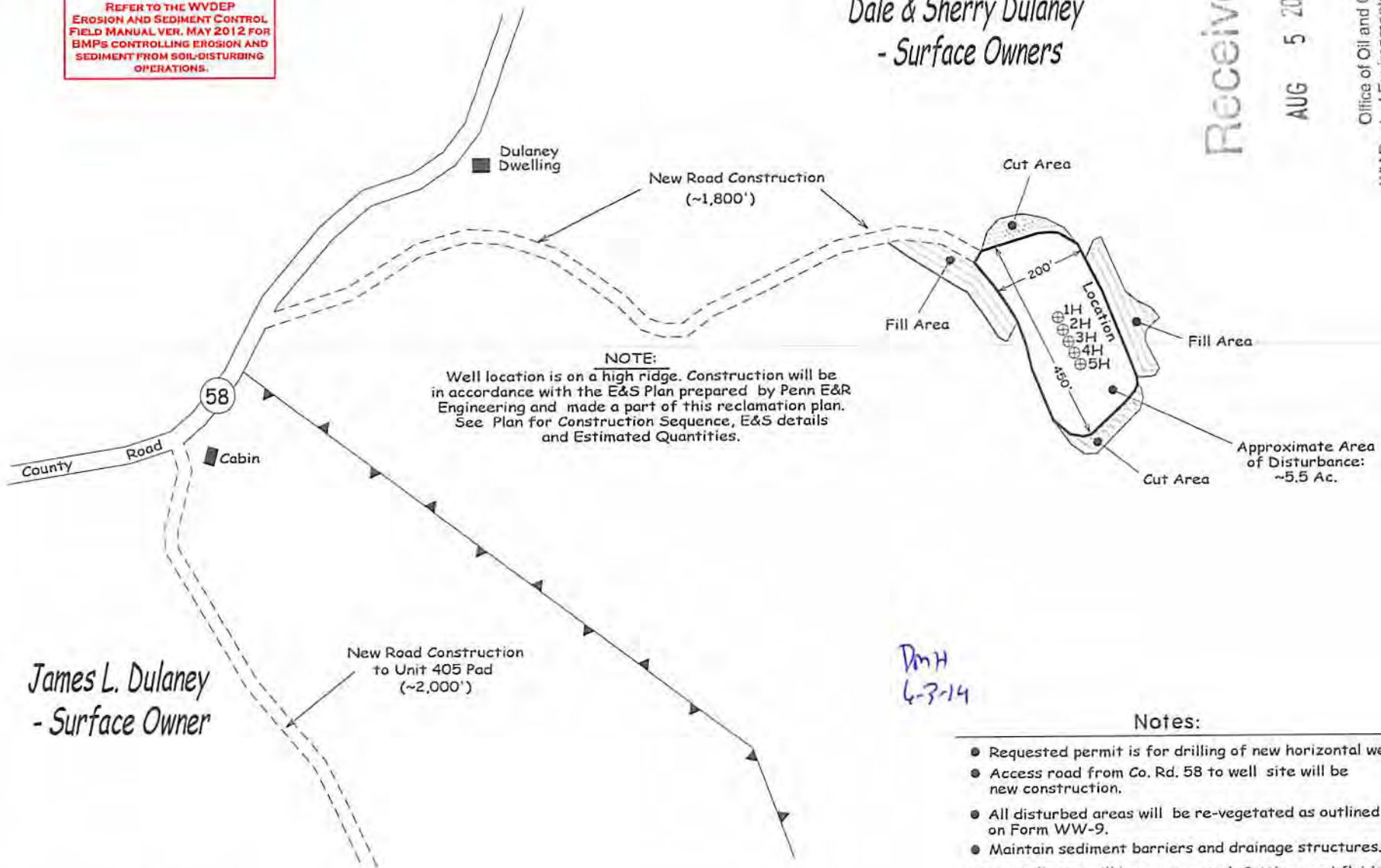
NOTE
 REFER TO THE WVDEP
 EROSION AND SEDIMENT CONTROL
 FIELD MANUAL VER. MAY 2012 FOR
 BMPs CONTROLLING EROSION AND
 SEDIMENT FROM SOIL-DISTURBING
 OPERATIONS.

*Dale & Sherry Dulaney
- Surface Owners*

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WV Dept. of Environmental Protection



*James L. Dulaney
- Surface Owner*

*DMH
6-3-14*

Notes:

- Requested permit is for drilling of new horizontal wells.
- Access road from Co. Rd. 58 to well site will be new construction.
- All disturbed areas will be re-vegetated as outlined on Form WW-9.
- Maintain sediment barriers and drainage structures.
- No drill pits will be constructed. Cuttings and fluids will be collected in a closed loop drilling system. Fluids will be re-used or hauled for disposal. Cuttings will be hauled to an approved landfill.

Note: Drawing not to Scale

WW-9
(9/13)

API Number 47 - 103 - 03026
Operator's Well No. MA Miller 406 N-4H

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name HG Energy, LLC OP Code 494497948

Watershed (HUC 10) North Fork Fishing Creek Quadrangle Big Run 7.5'

Elevation 1369' County Wetzel District Grant

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: _____

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

Proposed Disposal Method For Treated Pit Wastes:

- Land Application
- Underground Injection (UIC Permit Number _____)
- Reuse (at API Number _____)
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain Closed Loop Disposal System)

*DMH
6-3-14*

Will closed loop system be used? If so, describe: Cuttings and fluids will be collected in a closed loop system, re-used or hauled to an approved disposal site or landfill.

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

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

Additives to be used in drilling medium? Water, soap, KCl, barite

Drill cuttings disposal method? Leave in pit, landfill, removed offsite, etc. Approved landfill

-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 (Permit # 1110222-WV52)

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 Diane White AUG 5 2014

Company Official (Typed Name) Diane White

Company Official Title Accountant

Office of Oil and Gas
WV Dept. of Environmental Protection

Subscribed and sworn before me this 21 day of May, 2014

Jerry L. Pille
Nov 12, 2018



My commission expires _____

09/05/2014

Form WW-9

Operator's Well No. MA Miller 406 N-4H

HG Energy, LLC

Proposed Revegetation Treatment: Acres Disturbed 10.62 Prevegetation pH _____

Lime 2 Tons/acre or to correct to pH 6.5

Fertilizer type 10/20/20

Fertilizer amount 500 lbs/acre

Mulch 2 Tons/acre

Seed Mixtures

Temporary

Permanent

Seed Type lbs/acre
Tall Fescue 40

Ladino Clover 5

Seed Type lbs/acre
Tall Fescue 40

Ladino Clover 5

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: _____

Received

Title: Oil + Gas Inspector

Date: 6-3-14

AUG 5 2014

Field Reviewed? Yes No

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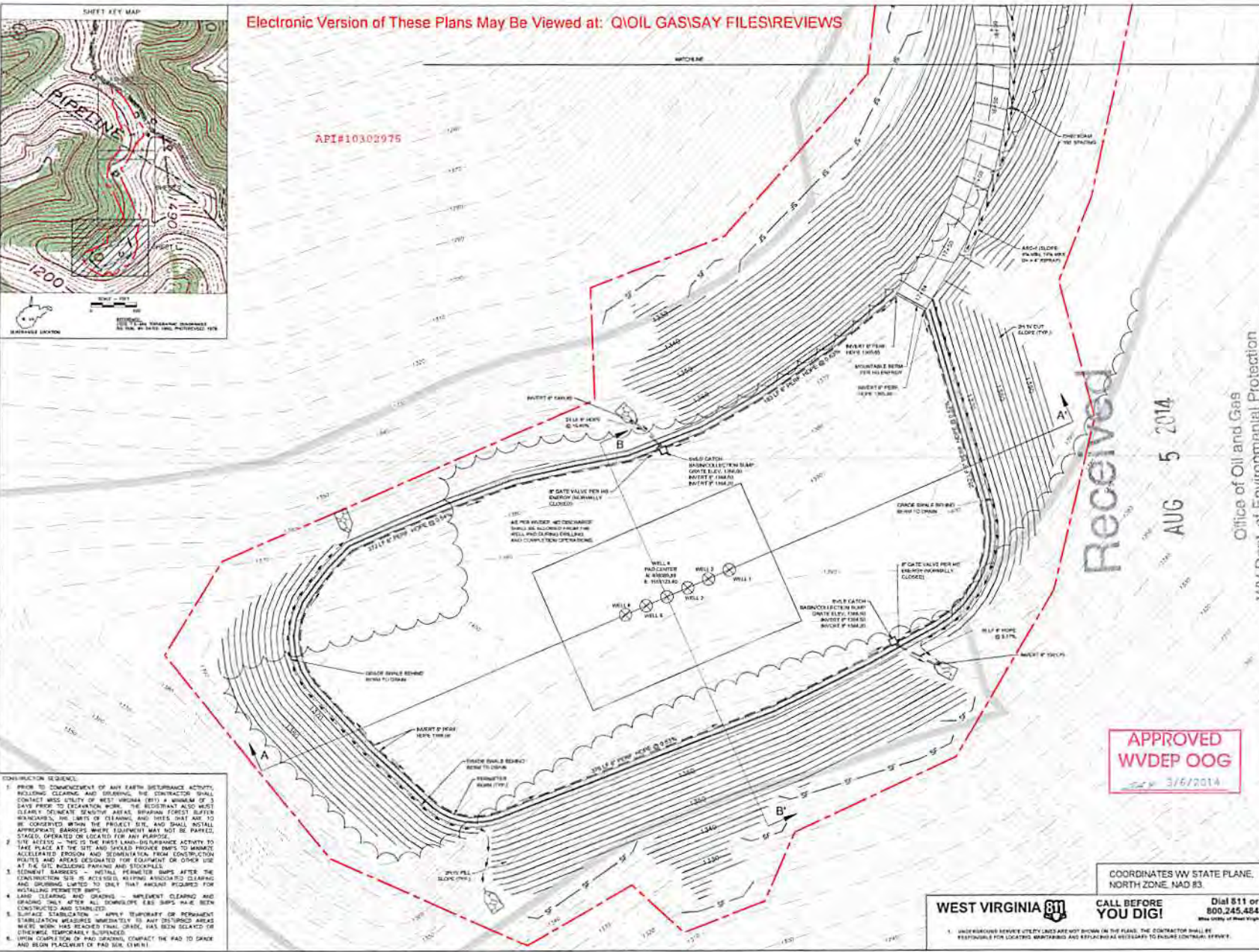
09/05/2014

103-03026



Electronic Version of These Plans May Be Viewed at: Q:\OIL GAS\ISAY FILES\REVIEWS

API#10302975



CONSTRUCTION SEQUENCE:

1. PRIOR TO COMMENCEMENT OF ANY EARTH DISTURBANCE ACTIVITY, INCLUDING CLEARING AND DRILLING, THE CONTRACTOR SHALL CONTACT WEST VIRGINIA (WV) A MINIMUM OF 3 DAYS PRIOR TO COMMENCING WORK. THE DISTURBANCE ALSO MUST CLEARLY DEMONSTRATE SENSITIVE AREAS, WETLANDS, FOREST BUFFERS, WETLANDS, OR LIMITS OF CLEARING AND THIS DATA ARE TO BE CONSIDERED WITHIN THE PROJECT SITE, AND SHALL INSTALL APPROPRIATE BARRIERS WHERE EQUIPMENT MAY NOT BE PARKED, STAGED, OPERATED OR LOCATED FOR ANY PURPOSE.
2. SITE ACCESS - THIS IS THE FIRST LAND-DISTURBANCE ACTIVITY TO TAKE PLACE AT THE SITE AND SHOULD PROVIDE BMP'S TO MINIMIZE ACCELERATED EROSION AND SEDIMENTATION FROM CONSTRUCTION TRUCKS AND AREAS DESIGNATED FOR EQUIPMENT OR OTHER USE AT THE SITE INCLUDING PARKING AND STOCKPILES.
3. SEDIMENT BARRIERS - INSTALL PERIMETER BMP'S AFTER THE CONSTRUCTION SITE IS ACCESSIBLE, KEEPING ANNOYING CLEARING AND GRUBBING LIMITED TO ONLY THAT AREA REQUIRED FOR INSTALLING PERIMETER BMP'S.
4. LAND CLEARING AND GRADING - NEARBY CLEARING AND GRADING ONLY AFTER ALL SEDIMENTATION BMP'S HAVE BEEN CONSTRUCTED AND STABILIZED.
5. SURFACE STABILIZATION - APPLY TEMPORARY OR PERMANENT STABILIZATION MEASURES IMMEDIATELY TO ANY EXPOSED AREAS WHERE WORK HAS REACHED FINAL GRADE, HAS BEEN SELECTED OR OTHERWISE TEMPORARILY SUSPENDED.
6. UPON COMPLETION OF PAD SPACING, CONTRACT THE PAD TO GRADE AND BEGIN PLACEMENT OF PAD SIDE CURBS.

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APPROVED WVDEP OOG
3/6/2014

SHEET SET LIST	
SHT. NO.	DESCRIPTION
1-3	SITE DEVELOPMENT PLAN
4	WELL PAD CROSS SECTIONS
5	ACCESS ROAD PROFILES
6	ACCESS ROAD SECTIONS
7	CONSTRUCTION NOTES
8-11	CONSTRUCTION DETAILS
12-15	SURVEY POINT PLANS
16	SITE RECLAMATION PLAN

LEGEND	
	BREAK UPON
	COLLECTION CHANNEL
	SILT FENCE
	APPROXIMATE LIMITS OF DISTURBANCE
	APPROXIMATE PROPERTY LINE
	LIMIT OF SURVEYED SITE TOPOGRAPHY

- GENERAL NOTES:**
1. REFERENCE THIS SHEET WITH THE CONSTRUCTION NOTES AND DETAILS.
 2. SITE TO BE CONSTRUCTED IN ACCORDANCE WITH WELL DRILLING PERMIT CONSTRUCTION REQUIREMENTS TO OBTAIN ALL OTHER NECESSARY PERMITS/APPROVALS REQUIRED TO CONSTRUCT SITE INCLUDING BUT NOT LIMITED TO FEDERAL, STATE AND LOCAL REQUIREMENTS.
 3. NO DISTURBANCE OF SLOPE STABILITY ANALYSES HAS BEEN PERFORMED FOR THIS SITE. CONTRACTOR IS RESPONSIBLE TO ESTABLISHED PROPER EROSION AND SEDIMENTATION CONTROL MEASURES (CONSTRUCTION PRACTICES) BASED ON FIELD CONDITIONS TO PREVENT EROSION AND SEDIMENTATION CONTROL BMP'S PRIOR TO CONSTRUCTION.
 4. REMOVE AND STOCKPILE AVAILABLE TOPSOIL FROM WITHIN THE LIMIT OF DISTURBANCE.
 5. NO EXCESSIVE FILL SHALL BE PLACED ON EXISTING MATERIAL, FILL MATERIAL SHALL BE FREE OF STONES, LARVAE, ROCKS, FROSTED SOIL OR OTHER OBJECTIONABLE MATERIAL.
 6. CUT/FILL SLOPES SHALL BE CONSTRUCTED TO A MINIMUM SLOPE OF 2:1 UNLESS NOTED OTHERWISE.
 7. FILL MATERIAL WILL BE PLACED IN LIFTS OF LIMITED OVER THE LENGTH OF THE FILL. LIFT THICKNESS OF THE SOIL SHALL BE AS THIN AS THE SURFACE BEING EXCAVATED UNTIL THE POINT PRIMARILY IS 12 INCHES DEEP. THE SIZE OF ROCK LIFTS SHALL NOT EXCEED 12 INCHES IN ANY DIMENSION. CONSTRUCTION SHALL BE OBTAINED BY CONSTRUCTION EQUIPMENT SHEETS, FOOT OF PAD BOLLER, WITH CONSTRUCTION TO VISIBLE NON-MOVEMENT OF THE EMBANKMENT MATERIAL. CONSTRUCTION SHALL NOT EXCEED EMBANKMENT MAXIMUM LIMITS. EACH LIFT SHALL BE COMPACTED TO A STANDARD PROCTOR DENSITY OF AT LEAST 90% BEFORE BEGINNING THE NEXT LIFT. TESTING SHALL BE PERFORMED AT A RATE OF 2 TESTS/acre/ft.
 8. THE CATCH BASIN/SEDIMENTATION BASIN SHALL BE A TYPE B BUILT TO MEET THE REQUIREMENTS OF THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION (WVDO) OR EQUIVALENT STANDARD. STANDARD SHEET DWG-3 OF EQUIVALENT.
 9. THE BERM PERIMETER BMP'S SHALL CONSIST OF SANDY/WOODEN A-NON PERFORATED HOPE PIPE. THE PIPE SHALL HAVE A MINIMUM 12" BERM OF SOIL OVER THE BERM PROTECTION SHALL BE USED TO PREVENT EROSION FROM THE SEDIMENTATION.
 10. ALL EXPOSED EARTHWORK SHALL BE PROTECTED BY VEGETATION OR OTHER MEANS TO PREVENT EROSION AND SEDIMENTATION. VEGETATION SHALL BE PLANTED AND MAINTAINED IN ACCORDANCE WITH REGULATIONS.
 11. ALL EXPOSED EARTHWORK SHALL BE PROTECTED BY VEGETATION OR OTHER MEANS TO PREVENT EROSION AND SEDIMENTATION. VEGETATION SHALL BE PLANTED AND MAINTAINED IN ACCORDANCE WITH REGULATIONS.
 12. SEDIMENTATION CONTROL MEASURES SHALL BE PROVIDED DURING DRILLING OPERATIONS. ALL EXPOSED EARTHWORK SHALL BE INSTALLED PRIOR TO DRILLING AND WATER BODIES SECONDARY CONTAINMENT SHALL BE DEPOSED OFFSITE IN ACCORDANCE WITH WV REGULATIONS.

- REFERENCE:**
1. SITE TOPOGRAPHY PROVIDED BY HG ENERGY, LLC ON FEBRUARY 23, 2013 AND FROM INDIAN OIL COMPANY (IIOC)/SANTITAS (IUS) LLC.
 2. PROPERTY OWNED BY INDIAN OIL COMPANY, LLC.

NO.	DATE	DESCRIPTION	BY
1	02/26/2014	GENERAL COMMENTS PER WDEP	
2			
3			

SITE CONSTRUCTION PLAN WITH EROSION AND SEDIMENTATION CONTROLS
WELL UNIT 406/407
WV POLY-L DISTRICT
WETZEL COUNTY, WEST VIRGINIA

PREPARED FOR:
HG ENERGY
VIENNA, WEST VIRGINIA

APPROVED BY: [Signature]
DATE: 3/6/2014

WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
17481
STATE OF WEST VIRGINIA

DRIVING NUMBER: PAD04827-01
SHEET 1

100 RYAN COURT, PITTSBURGH, PA 15206
412-722-1222

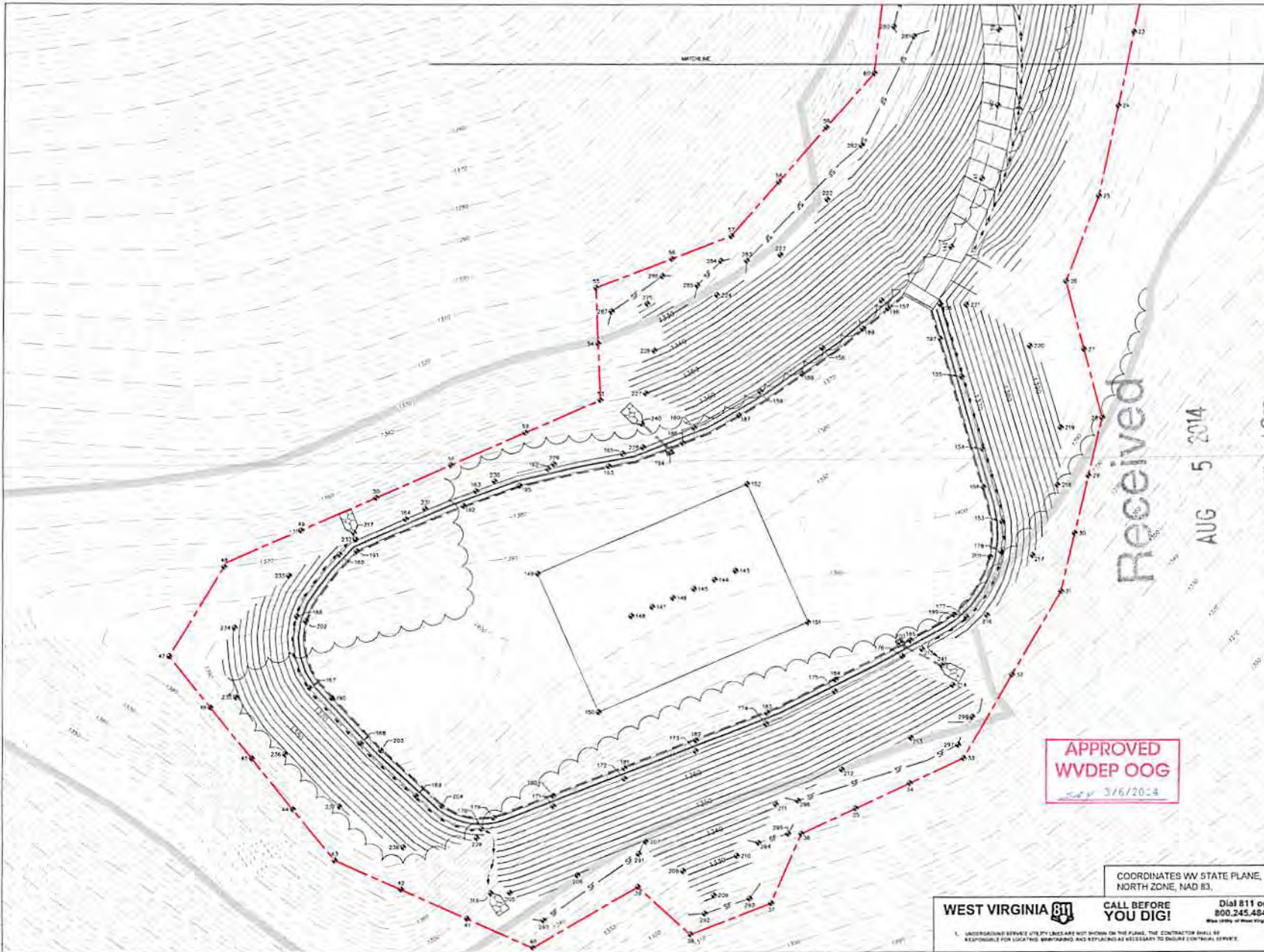
WEST VIRGINIA

CALL BEFORE YOU DIG!

Dial 811 or 800.245.4848
www.811.wv.gov

1. UNDERGROUND SERVICE UTILITIES (USUTS) ARE NOT SHOWN ON THE PLANS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, MAINTAINING AND REPLACING AS NECESSARY TO ENSURE CONTINUAL SERVICE.

Office of Oil and Gas
WV Dept. of Environmental Protection



LEGEND

	BRAP AROUND
	COLLECTION CHANNEL
	SUPER SALT FENCE
	APPROXIMATE LIMITS OF DISTURBANCE
	APPROXIMATE PROPERTY LINE
	LIMIT OF SURVEYED SITE TOPOGRAPHY



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 AUG 5 2014
 Office of Oil and Gas
 Dept. of Environmental Protection

REFERENCE

1. SITE TOPOGRAPHY PROVIDED BY HG ENERGY, LLC ON FEBRUARY 23, 2013 AND FROM SACS SURVEYING (DRAFT/NEARLY UNUSABLE)
2. PROPERTY OWNED BY OTHERS FOR HG ENERGY, LLC

THE ENGINEER HAS CONDUCTED VISUAL GENERAL VERIFICATION OF THE TOPOGRAPHY PROVIDED BY HG ENERGY, LLC AND HAS FOUND IT TO BE REASONABLY ACCURATE FOR THE PURPOSES OF THIS DRAWING. HOWEVER, THE ENGINEER HAS NOT CONDUCTED A FIELD SURVEY TO VERIFY THE ACCURACY OF THE TOPOGRAPHY PROVIDED BY HG ENERGY, LLC. THE ENGINEER HAS NOT CONDUCTED A FIELD SURVEY TO VERIFY THE ACCURACY OF THE TOPOGRAPHY PROVIDED BY HG ENERGY, LLC. THE ENGINEER HAS NOT CONDUCTED A FIELD SURVEY TO VERIFY THE ACCURACY OF THE TOPOGRAPHY PROVIDED BY HG ENERGY, LLC.

REVISION	DATE	DESCRIPTION
1	02/24/2014	GENERAL COMMENTS PER WVDOP

GRAPHIC SCALE

APPROVED
 WVDEP OOG
 3/6/2014

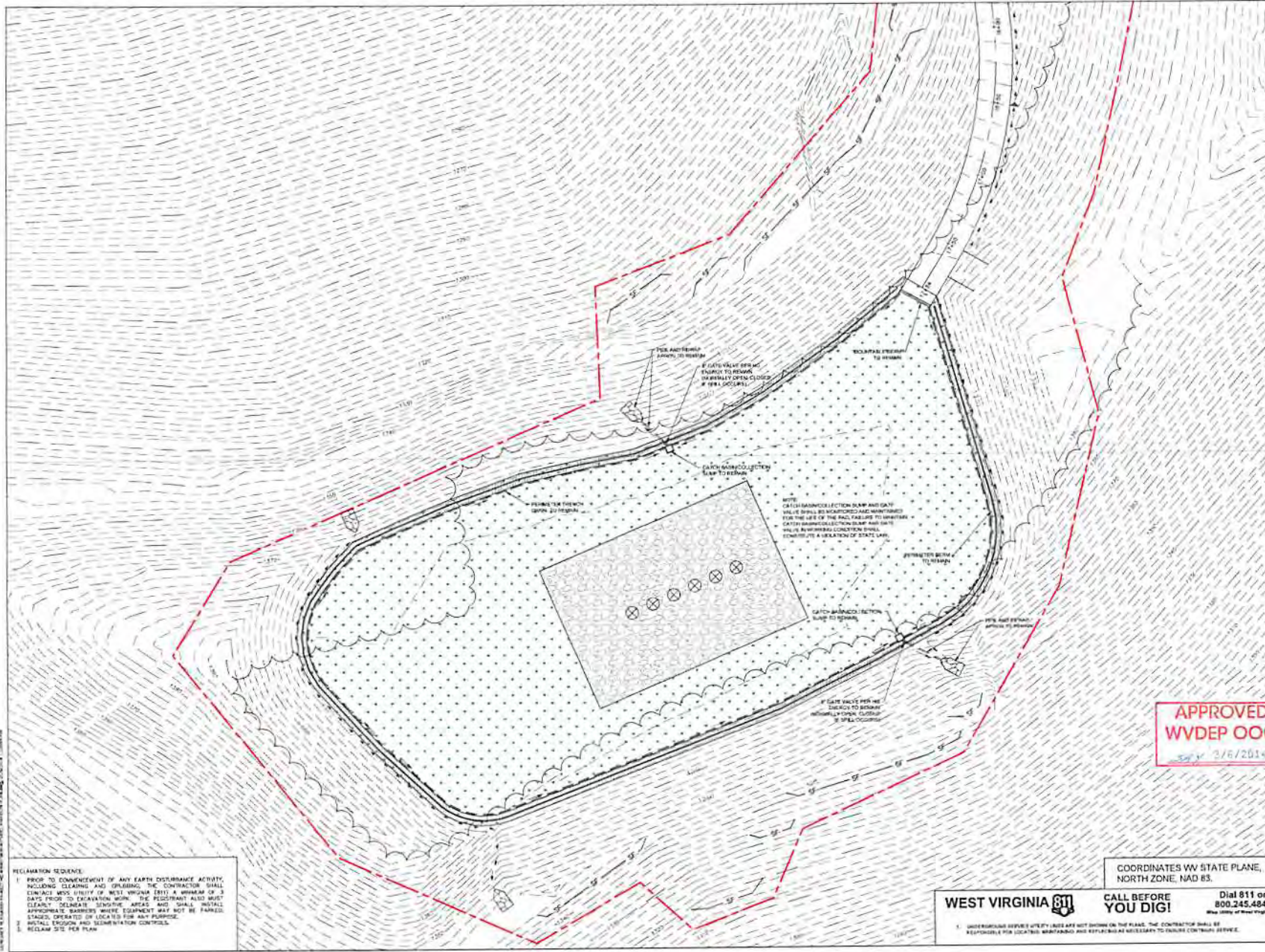
COORDINATES WV STATE PLANE,
NORTH ZONE, NAD 83.

WEST VIRGINIA
 CALL BEFORE YOU DIG!
 Dial 811 or 800.245.4848
West Virginia's 24-hour, toll-free number for utility location services.

APPROVED: WV 06/18/2015
 CHECKED: WVP 04/08/2015
 DRAWN: WVP 03/24/2015
 PROJECT NO.: 4000-364827
 DRAWING NUMBER: PAD04827-01
 SHEET 12

Penn E&R
 Environmental & Remediation, Inc.
 100 RYAN COURT, PITTSBURGH, PA 15220
 412-722-1222

DATE PLOTTED: 03/24/2015 10:44:11 AM
 PLOTTER: HP DesignJet T1100PS



LEGEND

- SLOPEWATCH ALARM
- COLLECTION CHANNEL
- REINFORCED SILT FENCE
- APPROXIMATE LIMITS OF DISTURBANCE
- APPROXIMATE PROPERTY LINE
- RECLAIMED AREA
- GRAVEL AREA TO RECLAIM

GENERAL NOTES:

1. RECLAMATION (SOIL PREPARATION SEED AND MULCH) WILL OCCUR ONLY IN AREAS THAT ARE NOT UTILIZED DURING PRODUCTION OPERATIONS.
2. FOR ALL PLACEMENT DURING RECLAMATION, USE A MINIMUM LIFT THICKNESS OF 24-INCHES AND A MINIMUM COMPACTION TO 90% OF THE STANDARD PROCTOR DENSITY (ASTM D-998).

Received

AUG 5 2014

Office of Oil and Gas
WV Dept. of Environmental Protection

THIS PLAN AND SPECIFICATIONS SHALL BE USED ONLY FOR THE PROJECT AND SITE IDENTIFIED HEREON. ANY OTHER USE OF THIS PLAN OR SPECIFICATIONS WITHOUT THE WRITTEN CONSENT OF THE ENGINEER IS PROHIBITED. THE ENGINEER ASSUMES NO LIABILITY FOR ANY DAMAGE OR INJURY TO PERSONS OR PROPERTY CAUSED BY THE USE OF THIS PLAN OR SPECIFICATIONS.

REVISION	DATE	GENERAL COMMENTS PER WVDPEP	DESCRIPTION
1	02/24/2014		

APPROVED
WVDEP OOG
Date: 3/6/2014



GRAPHIC SCALE: 1" = 20'

SITE RECLAMATION PLAN
WELL UNIT 406/407
WETZELVILLE DISTRICT
WETZEL COUNTY, WEST VIRGINIA

PREPARED FOR
HG ENERGY
VIENNA, WEST VIRGINIA

RECLAMATION SEQUENCE:

1. PRIOR TO COMMENCEMENT OF ANY EARTH DISTURBANCE ACTIVITY, INCLUDING CLEARING AND GRUBBING, THE CONTRACTOR SHALL CONTACT MISS ENVIRONMENTAL WEST VIRGINIA (EVI) A MINIMUM OF 3 DAYS PRIOR TO EXCAVATION WORK. THE RECLAIMANT ALSO MUST CLEARLY DELINEATE SENSITIVE AREAS AND SHALL INSTALL APPROPRIATE BARRIERS WHERE EQUIPMENT MAY NOT BE STAGED, OPERATED OR LOCATED FOR ANY PURPOSE.
2. INSTALL EROSION AND SEDIMENTATION CONTROLS.
3. RECLAIM SITE PER PLAN.

COORDINATES WV STATE PLANE,
NORTH ZONE, NAD 83.



CALL BEFORE YOU DIG!

Dial 811 or
800.245.4848



APPROVED BY: 08/10/2013
CHECKED BY: 08/29/2013
DATE: 08/29/2013
PROJECT NO.: 4000-264237
DRAWING NUMBER: PA004527-01
SHEET: 1E

UNDESIRABLE DEBRIS (WEEDS AND NOT SHOWN ON THE PLAN), THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING, MAINTAINING AND REPLACING AS NECESSARY TO ENSURE CONTINUAL SERVICE.

100 RYAN COLONY, PITTSBURGH, PA 15206
412-722-1222

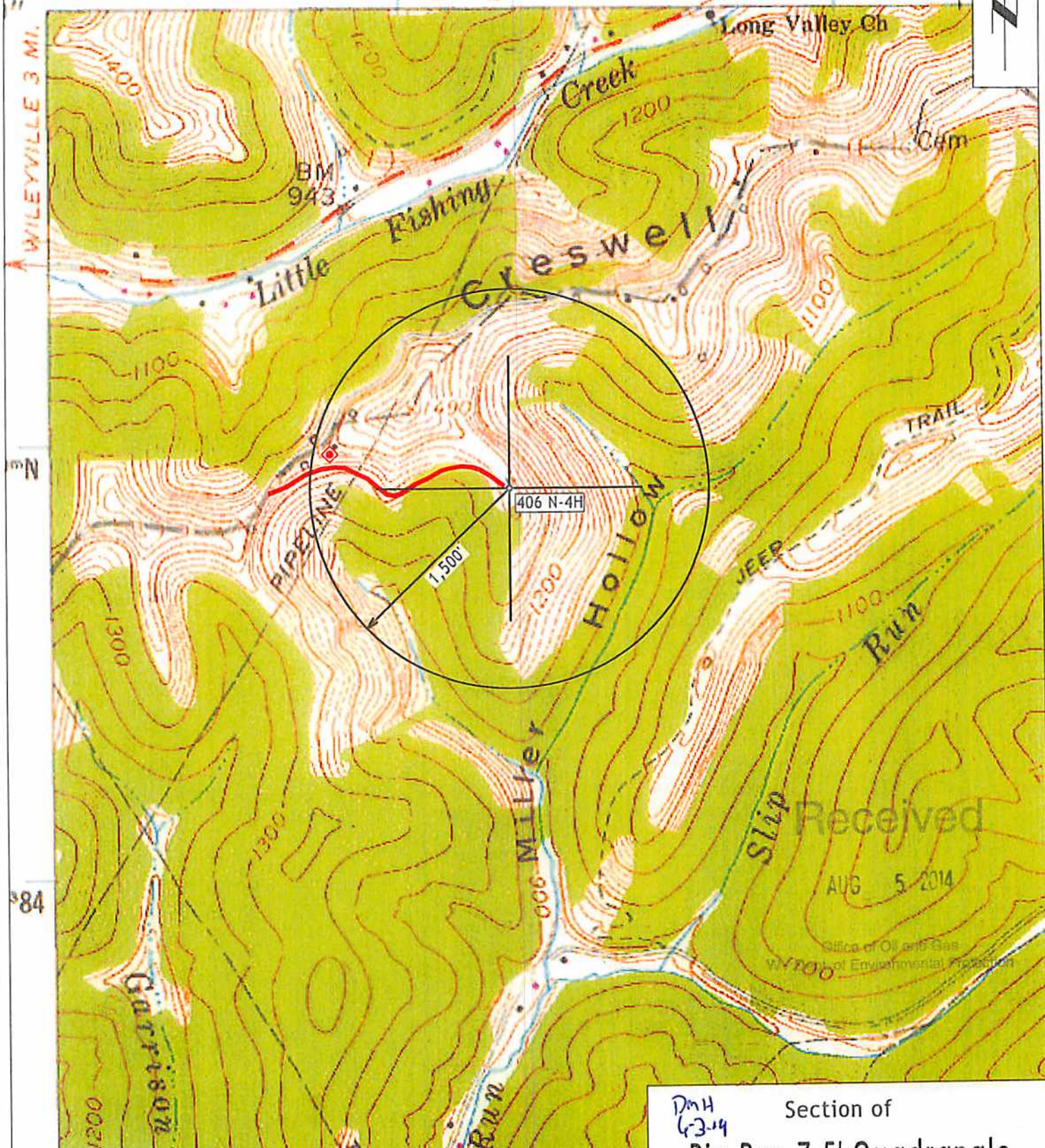
SUBJECT WELL
Mary A. Miller 406 N-4H

OF THE INTERIOR AL SURVEY

12 MI. TO U.S. 25
UNIONTOWN 3 MI

37° 30'

533000mE



WILEYVILLE 3 MI.

84

84

◆ Denotes Potential Water Supply Source
(From Aerial Photography)

DMH
6-3-14
Section of
Big Run 7.5' Quadrangle
09/05/2014
SCALE 1"=1000'

Received
AUG 5 2014

Office of Oil and Gas
Department of Environmental Protection

BOTTOM HOLE: LON: -80°37'56.3"

LON: -80°36'45.4"

8250

LON: 80°35'00"

3640

LAT: 39°36'54.0"

BOTTOM HOLE: LAT: 39°38'03.5"

SURVEY NOTES

1 - Well ties and Latitude and Longitude were measured by DGPS (Sub-meter Mapping Grade). Bearings are referenced to UTM Grid North (Zone 17 North - NAD 1927).

2 - Surface owners & adjoiner information obtained from Wetzel Co. Assessor's Office. Lease names & line mapping provided by HGE GIS system. Ends of unit lines mapped by MLS llc & HGE. (Zone 17 North - NAD 1927)

3 - No Title Opinion was provided to the Surveyor during this survey. This survey is subject to a complete title Opinion.

UTM Coordinates
(Zone 17N-NAD 1983)

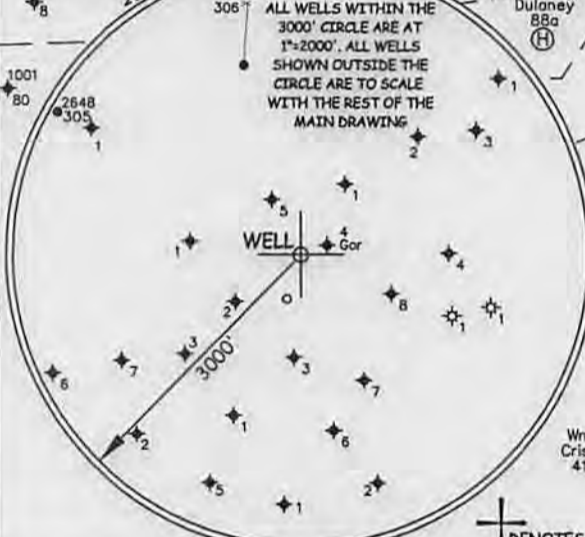
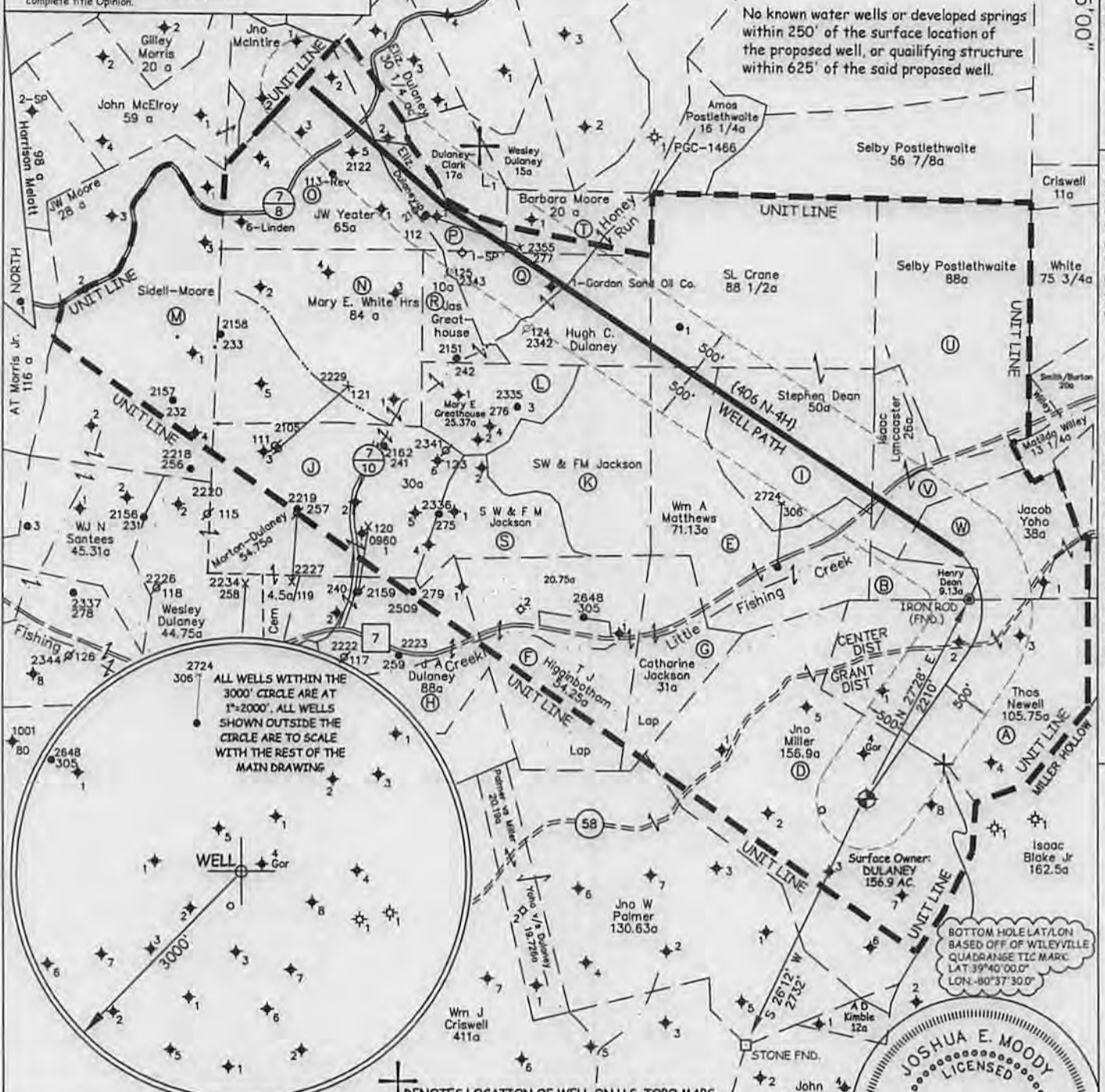
Surface N--4,385,110m.
E--533,268m.

Bottom Hole N--4,387,244m.
E--531,570m.

NAD83
LOCATION REFERENCES
N 41°54' W 545' 5/8" REBAR
S 21°13' E 190' SPIKE

LAT: 39°37'30"
**REVISED MAP OF
H.G. ENERGY, LLC
-MILLER 406 UNIT-**

No known water wells or developed springs within 250' of the surface location of the proposed well, or qualifying structure within 625' of the said proposed well.



BOTTOM HOLE LAT/LON
BASED OFF OF WILEYVILLE
QUADRANGLE TIC MARK
LAT: 39°40'00.0"
LON: -80°37'30.0"



JOB # 13-001
DRAWING # 13HG405B 406B
SCALE 1" = 1500'
MINIMUM DEGREE OF ACCURACY 1/200'
PROVEN SOURCE OF ELEV. 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 PERSCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



**WEST VIRGINIA DEPARTMENT
OF ENVIRONMENTAL PROTECTION,
OFFICE OF OIL AND GAS**

MOODY LAND SURVEYING, LLC
ST. MARYS, WV 26170

JOSHUA E. MOODY, P.S. 2020
DATE 5/07/14
OPERATOR'S WELL # 406 N-4H

WELL TYPE: OIL GAS LIQUID INJECTION ___ WASTE DISPOSAL ___ HORIZONTAL
(IF "GAS") PRODUCTION STORAGE ___ DEEP ___ SHALLOW
LOCATION: ELEVATION 1369' WATERSHED NORTH FOR, FISHING CREEK API WELL # 47 - 103 - 03026
DISTRICT GRANT COUNTY WETZEL STATE COUNTY PERMIT

QUADRANGLE BIG RUN 7.5'
SURFACE OWNER DALE K. DULANEY (surface hole) ACREAGE 156.9 AC. +/-
OIL & GAS ROYALTY OWNER ARTHUR MILLER et al LEASE ACREAGE 156.9 AC. +/-
PROPOSED WORK: DRILL CONVERT ___ DRILL DEEPER ___ REDRILL ___ FRACTURE OR
STIMULATE PLUG OFF OLD FORMATION ___ PERFORATE NEW FORMATION ___
OTHER PHYSICAL CHANGE IN WELL (SPECIFY) ___
PLUG & ABANDON ___ CLEAN OUT & REPLUG ___
TARGET FORMATION MARCELLUS
WELL OPERATOR H.G. ENERGY, LLC ESTIMATED DEPTH TVD= 7,230' MD= 17,053'
ADDRESS 5260 DuPONT ROAD DESIGNATED AGENT MIKE KIRSCH
PARKERSBURG, WV 26101 ADDRESS 5260 DuPONT ROAD
PARKERSBURG, WV 26101

09/05/2014