



**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 09, 2014

**WELL WORK PERMIT**  
**Horizontal 6A Well**

This permit, API Well Number: 47-10302995, issued to TRIAD HUNTER, 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: WVDNR #1410  
Farm Name: WV CONSERVATION COMMISSION  
**API Well Number: 47-10302995**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 06/09/2014

## 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 (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](mailto: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 4 548

1) Well Operator: TRIAD HUNTER, LLC 494494833 Wetzel Grant Pine Grove  
Operator ID County District Quadrangle

2) Operator's Well Number: WVDNR # 1410 H Well Pad Name: WVDNR ( Pad 6 )

3) Farm Name/Surface Owner: WV Conservation Commission Public Road Access: Buffalo Run Road ( CR 8/2 )

4) Elevation, current ground: 1475' Elevation, proposed post-construction: 1460'

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

(b) If Gas Shallow  Deep \_\_\_\_\_  
Horizontal

6) Existing Pad: Yes or No YES

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7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
Marcellus Shale, TVD = 7591', Thickness = 55', BHP = 3,000 psi.

8) Proposed Total Vertical Depth: 7591' ( At Toe )

9) Formation at Total Vertical Depth: Marcellus Shale

10) Proposed Total Measured Depth: 12,204'

11) Proposed Horizontal Leg Length: 3,932'

12) Approximate Fresh Water Strata Depths: Surface to 1,200 feet

13) Method to Determine Fresh Water Depths: Data from other wells in the area.

14) Approximate Saltwater Depths: 1,750' - 2,750'

15) Approximate Coal Seam Depths: 500' - 1,200'

16) Approximate Depth to Possible Void (coal mine, karst, other): No open mines in the area, No known voids

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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WW-6B  
(9/13)

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**CASING AND TUBING PROGRAM**

<u>TYPE</u>	<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	20"	new	A53B	90 lb.	100'	100'	Grout to Surface
Fresh Water	13 3/8"	new	J-55	54.5 lb.	1300'	1300'	To Surface
Coal							
Intermediate	9 5/8"	new	J-55	36 lb.	3400'	3400'	To Surface
Production	5 1/2"	new	P-110	20 lb.	N/A	12,200'	To Surface
Tubing	2 3/8"	new	J-55	4.70 lb.	N/A	unknown	N/A
Liners							

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<u>TYPE</u>	<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"	24"	.375	1,380 psi.	Class A	1.18 - 1.21
Fresh Water	13 3/8"	17 1/2"	.760	2,730 psi.	Class A	1.20 - 1.24
Coal						
Intermediate	9 5/8"	12 1/4"	.704	3,520 psi.	Light / Class A	1.70 - 1.20
Production	5 1/2"	8 3/4"	.722	12,360 psi.	50:50 Poz / Class H	1.44 - 1.63
Tubing	2 3/8"	4 3/4"	.380	7,700 psi.	N/A	N/A
Liners						

**PACKERS**

Kind:	N/A			
Sizes:	N/A			
Depths Set:	N/A			

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

See Attachment: I-B

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

See Attachment: II-B

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 6.69 acres

22) Area to be disturbed for well pad only, less access road (acres): 4.60 acres

23) Describe centralizer placement for each casing string:

See Attachment: III-B

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

See Attachment: IV-B

25) Proposed borehole conditioning procedures:

See Attachment: V-B

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\*Note: Attach additional sheets as needed.

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#19 Proposed Well Work:

Drill and complete a new horizontal Marcellus Shale Well.

1. AIR/SOAP Drill 24" conductor hole to 100 feet; run 20" casing to T.D. and grout to surface.
2. AIR/SOAP Drill 17 1/2" surface hole to the projected depth; run 13 3/8" casing to T.D. and cement to surface with Class A Cement.
3. AIR/SOAP Drill 12 1/4" intermediate hole to the projected depth; run 9 5/8" casing to T.D. and cement to surface with Class A cement.
4. Fluid Drill 8 3/4" production hole to the projected total measured depth (TMD).
5. Run/Cement 5 1/2" production casing to the TMD; cement casing back to the surface with Class A and Class H cement.
6. Run Cased-hole logs.
7. Open toe sleeve and establish 15 BPM rate.
8. Perforate and stimulate multiple stages in Marcellus lateral section.
  - a. Perforations per stage = sixty to seventy
  - b. Average stage length = two hundred fifty feet
9. Clean-out 5 1/2" production casing using a coil tubing rig or a work over rig and snubbing unit.
10. Flow test well for seven to ten days to clean up wellbore and determine overall productivity.
11. Turn well into production.

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#20 Fracturing/Stimulation Methods:

Upon the successful cementation of the 5 1/2" production casing, completion of the well will be performed as follows:

1. Run a GR/CCL/Bond log from the bottom of the curve to surface.
2. Pressure-up on casing, open the toe sleeve and establish pump rate of 15 bpm through the toe sleeve.
3. Run a GR/CCL log from the toe to the base of the curve and correlate with the GR/CCL/Bon log.
4. Pump down through the casing a solid bridge plug and perforating guns.
5. Set the solid bridge plug just above the toe sleeve and perforate the first stage with 60-70 perforations over a 200'-250' interval (stage#1).
6. Fracture stage #1 with a slick water/sand stimulation using approximately 8,000bbls of water and 450,000lbs of sand. Average treating pressure is expected to range between 6,000psi and 7,000psi and average treating rates are expected to range between 70bbls and 80bbls per minute. Upon completion of the stage, the five minute and ten minute shut in pressures are recorded.
7. Repeat the same methodology of perforating and fracturing on subsequent stages using composite frac plugs instead of solid bridge plugs. Once the heel is reached, completion operations are suspended. The average number of stages completed in each well range between twenty and thirty.
8. Upon completion of the last stage, solid bridge plugs are set in the casing, just above the top of the curve and just below the well head for safety purposes.
9. Well is shut in until clean out and flow back operations are initiated.

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**#23 Centralizer Placement:**

- A. (20") Conductor Casing – No centralizers used.
- B. (13 3/8") Surface Casing – Between two and four run based on setting depth of casing.
- C. (9 5/8") Intermediate Casing – Between six and ten run based on setting depth of casing.
- D. (5 1/2") Production Casing:
  - 1. Spiral centralizers run on every 3<sup>rd</sup> joint from the toe to KOP (Top of Curve). Roughly 50-60 spiral centralizers run.
  - 2. Bow centralizers run on every 10<sup>th</sup> joint from the KOP to surface. Roughly 10-15 bow centralizers run.

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**(WW-6B)****#24 Cement Additives:****A. Conductor Cement Job (26" csg.)**

1. All conductor casings are cemented with standard CLASS A CEMENT.
  - a) Average weight = 15.6lb./gal
  - b) Average yield = 1.18 ft<sup>3</sup>/5k.
  - c) No additional additives are used.

**B. Surface Cement Job (13 3/8" csg.)**

1. Surface Cement Job (13 3/8" csg.)
  - a) Average weight = 15.4 to 15.6 lbs./gal
  - b) Average yield = 1.19 to 1.24 ft<sup>3</sup>/5k
2. Common Cement Additives:
  - a) ¼ lb./5k Cello Flake (Lost circulation material)
  - b) 2%-3% Calcium Chloride (Accelerator)

\*Note: Gel Sweep is usually pumped ahead of the cement.  
Gel Spacer consists of 6% gel w/cello Flake.

**C. Intermediate Cement Job ( 13 3/8" csg. & 9 5/8" csg. )**

Due to depth, most intermediate casings are cemented in two stages.

1. The upper (lead) stage cement job usually consists of CLASS A CEMENT or LIGHT CEMENT.
  - a) Average weight = 13.1 to 13.5 lbs. /gal.
  - b) Average yield = 1.54 to 1.70 ft<sup>3</sup>/5k.

**Common Additives**

- a) ¼ lb./5k Cello Flake (Lost circulation material)
- b) 1% - 2% Calcium Chloride (Accelerator)

\*Note: Gel Sweep is usually pumped ahead of the cement.

Gel Spacer consists of 6% gel w/cello Flake.

2. The lower (tail) stage usually consists of standard CLASS A CEMENT.
  - a) Average weight = 15.4 to 15.6 lbs./gal
  - b) Average yield = 1.18 to 1.20 ft<sup>3</sup>/5k.

**Common Additives**

- a) ¼ lb./5k Cello Flake (Lost circulation material)
- b) 1% - 2% Calcium Chloride (Accelerator)
- c) 1% bwoc EC-1 (Bonding Agent)
- d) 55% bwoc BA-10A (Bonding Agent)

**D. Longstring Cement Job (5 ½" csg.)**

Depending on how far cement is brought back into the intermediate casing, the production casing is usually cemented in two stages and a heavy weighted spacer is pumped ahead of the cement to condition the well bore.

1. Weighted Spacer
 

Ultra Flush II	50 bbs. @ 13lbs. /gal	
a) Barite	@257 lbs. /bbl	(Weighting Material)
b) US-40	2 gals. /bbl	(Surface tension reducer)
c) ss-2	13 lbs. /gal	(Suractant)
2. Weighted Spacer

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06/13/2014

- |            |                |                       |
|------------|----------------|-----------------------|
| a) Barite  | @257 lbs. /bbl | (Weighting Material)  |
| b) SS-2    | 1 lb. /gal     | (Surfactant)          |
| c) MPA-170 | 1 lb. /bbl     | (Fluid loss additive) |
3. Lead Slurry 50:50 POZ/Premium NE-1
- |  |  |  |
|--|--|--|
| a) Average Weight = 13.50 lbs. /gal          |  |  |
| b) Average yield = 1.44 ft <sup>3</sup> /5k. |  |  |
- Common Additives
- |              |             |                       |
|--------------|-------------|-----------------------|
| a) BA – 90   | 3lbs. /5k   | (Bonding Agent)       |
| b) R – 3     | .258 bwoc   | (Retarder)            |
| d) MPA – 170 | 1 lb. / bbl | (Fluid loss additive) |
4. Tail Slurry CLASS H CEMENT
- |   |  |  |
|---|--|--|
| a) Average Weight = 15.2lbs. /gal           |  |  |
| b) Average Yield = 1.64 ft <sup>3</sup> /5k |  |  |
- Common Additives
- |                        |            |                       |
|------------------------|------------|-----------------------|
| a) R-3                 | .2% bwoc   | (Retarder)            |
| c) CD-32               | .75 % bwoc | (Dispersant)          |
| d) ASA – 301           | .35 % bwoc | (Free water removal)  |
| e) BA-10A              | 1.25% bwoc | (Bonding Agent)       |
| f) ASCA                | 30lbs. /5k | (Solubility additive) |
| e) Sodium Metasilicate | .58 bwoc   | (Extender)            |

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06/13/2014

(WW-6B)

**#25 Borehole Conditioning Procedures:**

**17 1/2" hole** – Generally this section of the well is drilled on air with air compressors and boosters. It's imperative through this section of the well to have sufficient air volume and pressure on the borehole during drilling to ensure hole conditions remain clean and unobstructed. If a significant volume of freshwater is encountered during drilling "stiff foam" or soap is utilized to assist in lifting drill cuttings and freshwater out of the hole. "Red Rock" is a clay-dominant strata that is sensitive to freshwater in this area. Stiff foam is applied to the borehole when freshwater is encountered to prevent the clays from swelling and sloughing into the borehole.

**12 1/4" hole** - Generally this section of the well is drilled on air with air compressors and boosters. It's imperative through this section of the well to have sufficient air volume and pressure on the borehole during drilling to ensure hole conditions remain clean and unobstructed. If a significant volume of saltwater is encountered during drilling "stiff foam" or soap is utilized to assist in lifting drill cuttings and freshwater out of the hole. "Red Rock" is a clay-dominant strata that is sensitive to saltwater in this area. Stiff foam is applied to the borehole when saltwater is encountered to prevent the clays from swelling and sloughing into the borehole.

**8 1/2" hole** – Generally, this section of the well is drilled on fluid. In an effort to keep borehole conditions in good working order several mechanisms are used to condition the borehole:

1. **High Viscosity Sweeps:** Sweeps are mixed and pumped after drilling every 3 joints during the drilling process. Sweeps generally run 20 cp over the active mud system viscosity for 20 bbls.
2. **Clean-Up Cycle:** "Clean-Up Cycles" are utilized every 500' in the lateral section of the well. During this routine conditioning procedure drilling is halted for the amount of time it takes to circulate 2 sweeps to surface. Also, during this process the pipe is continuously rotated and reciprocated at this spot to help circulate out any "cutting beds" lying in the wellbore.
3. **Short Trips:** Short trips are utilized to work out tight spots and cutting beds from the borehole which cause increased torque and drag, and pressure. Two short trips are typically run during the drilling of this section of the wellbore. The first at the half-way point of the lateral. The drill pipe is pulled out of the hole to the "kick-off" point of the well. The second short trip is utilized at total depth (TD). At this point the drill pipe is pulled out of the wellbore to the half-way point of the lateral.
4. **At TOTAL DEPTH:** A clean-up cycle and short trip is utilized to condition the wellbore when total depth (TD) has been reached in preparation for running production casing.

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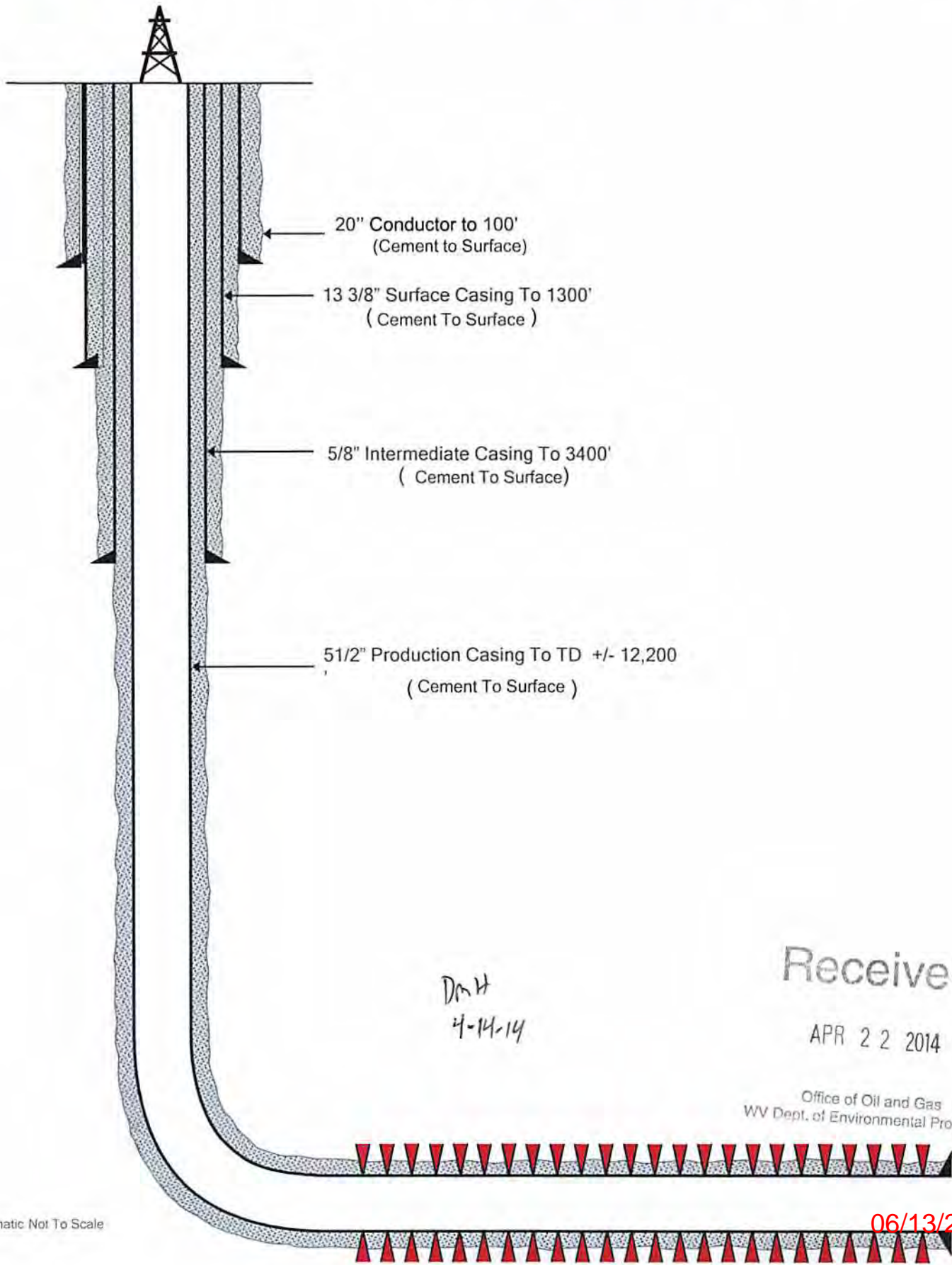
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# Magnum Hunter Resources MARCELLUS SHALE – WVDNR 1410 WELLBORE SCHEMATIC \*



\* Schematic Not To Scale

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WW-9  
(9/13)

API Number 47 - 103 - 02995  
Operator's Well No. WVDNR-1410

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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Triad Hunter, LLC OP Code 494494833

Watershed (HUC 10) Tributary of Buffalo Run Road Quadrangle Pine Grove

Elevation 1455' 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: n/a

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 Ohio Disposal Well 34-121-3995 )
- 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 cuttings/fluids/gasses are separated a series of vessels/gasbusters/centrifugal shale shaker. Cuttings are then solidified in debris boxes & hauled to landfill.

Drilling medium anticipated for this well (vertical and horizontal)? Air, freshwater, oil based, etc. Top Hole-Air Drilled. Lateral-Synthetic Mud

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

Additives to be used in drilling medium? See Attachment I-A: WVDNR-1410 Drilling Additives List

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

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

-Landfill or offsite name/permit number? Wetzel County Landfill, SWPU ID 12-10-45

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 [Signature]

Company Official (Typed Name) Rocky Roberts

Company Official Title Senior VP Appalachian Operations

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Subscribed and sworn before me this 3rd day of June, 2014

Pamela K. Nicholson



Notary Public  
Pamela K. Nicholson, Notary Public  
in and For The State of Ohio  
My Commission Expires 8-9-15

My commission expires 8-9-15

06/13/2014

103-02995

WW-9 Attachment: I-A

**WVDNR-1410 Drilling Additives List (API #: 47-103-02995)**

<b>Chemical Name</b>	<b>Description</b>
Barite	Drilling Fluid Additive
Calcium Chloride	Drilling Fluid Additive
Calcium Carbonate	Drilling Fluid Additive
Calcium Hydroxide (Lime)	PH Modifier
Gilsonite	Drilling Fluid Additive
Synthetic Hydrocarbons (Base Oil)	Drilling Fluid Additive

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Form WW-9

Operator's Well No. WVDNR 1410

Triad Hunter, LLC

Proposed Revegetation Treatment: Acres Disturbed No additional Prevegetation pH 6-7

Lime 2-5 Tons/acre or to correct to pH 6.0-7.0

Fertilizer type 10-20-20

Fertilizer amount 500 lbs/acre

Mulch 2 Tons/acre

Seed Mixtures

**Temporary**

**Permanent**

Seed Type	lbs/acre
Common Orchard Grass	30%
Perennial Rye	35%
Medium Red Clover	25%
Common Timothy	10%

Seed Type      lbs/acre

A different seeding mixture maybe required by the WVDNR.

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Will follow their requirement for all areas.

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**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: 4-14-14

Field Reviewed?  Yes  No

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# TRIAD HUNTER, LLC. WVDNR #1410

○ Install Minimum 12" Culvert

ALL ROADS SHOWN HEREON ARE EXISTING UNLESS OTHERWISE NOTED AND SHALL BE MAINTAINED IN ACCORDANCE WITH DEP OIL AND GAS BMP MANUAL ENTRANCES AT COUNTY/STATE ROADS SHALL BE MAINTAINED IN ACCORDANCE WITH WV DOT REGULATIONS. SEPARATE PERMITS MAY BE REQUIRED BY THE DOT.

SEDIMENT BASINS, TRAPS AND APPROPRIATE EROSION CONTROL BARRIERS ARE TO BE CONSTRUCTED AT ALL CULVERT AND CROSS DRAIN INLETS AND OUTLETS AS REQUIRED IN THE WV DEP OIL AND GAS BMP MANUAL. FIELD CONDITIONS "ROCK OUTFLOWS" AND BEDROCK MAY PROHIBIT INLET TRAPS BEING INSTALLED. WHEN THESE CONDITIONS EXIST, ADDITIONAL EROSION CONTROL MEASURES SHALL BE EVALUATED AND UTILIZED.

EARTHWORK CONTRACTORS ARE RESPONSIBLE FOR NOTIFYING TO THE OPERATOR AND INSPECTOR PRIOR TO ANY DEVIATION FROM THIS PLAN.

CONTRACTORS/COMPANY ARE RESPONSIBLE FOR LOCATING UTILITIES WHETHER SHOWN ON THIS PLAN OR NOT.

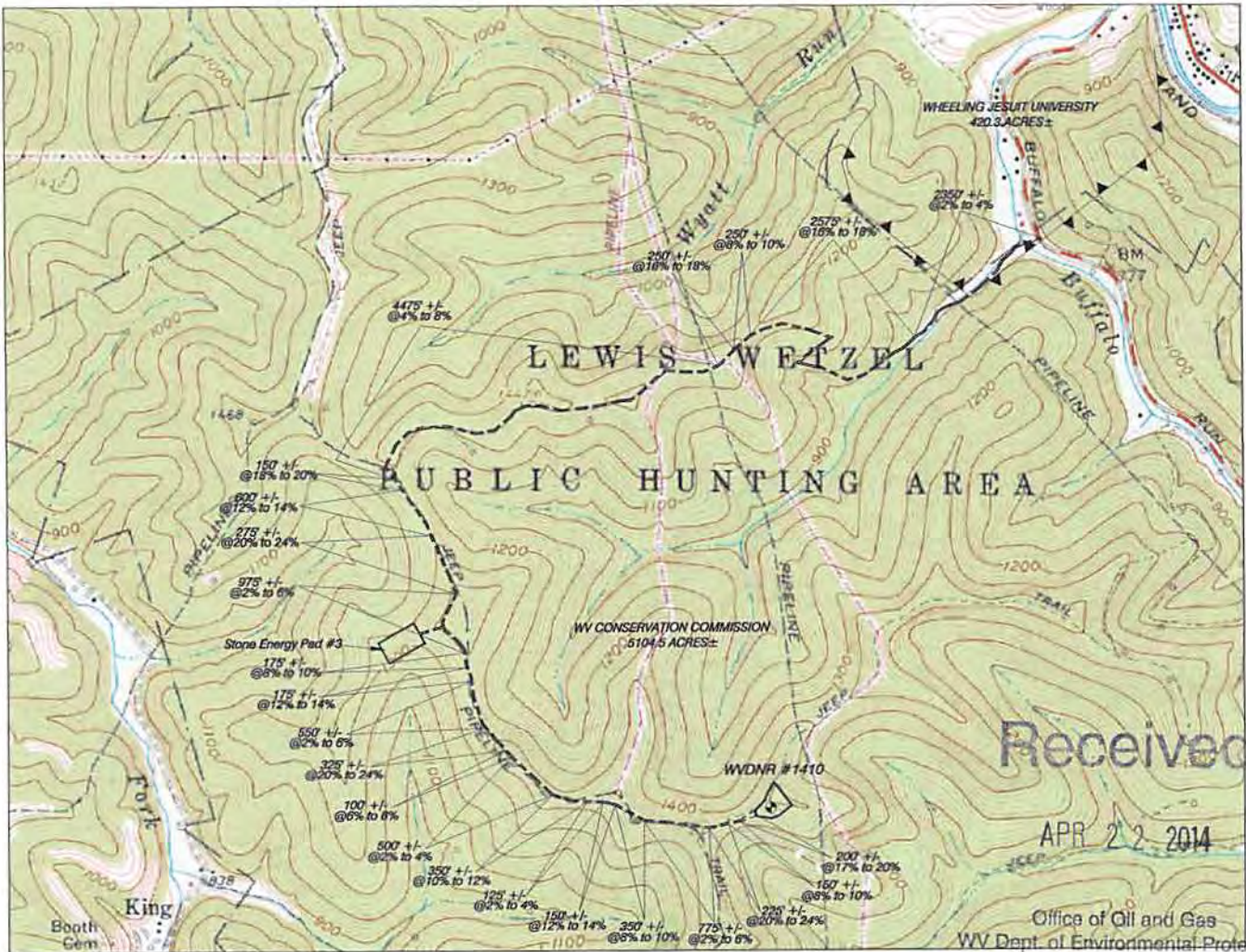
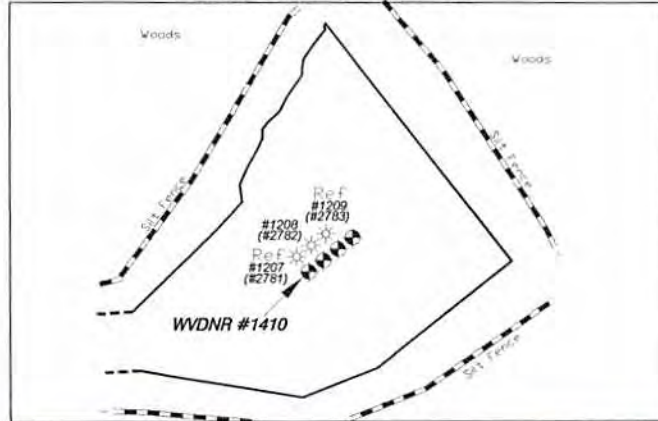
TEMPERARILY SEED AND MULCH ALL SLOPES AFTER CONSTRUCTION OF LOCATION.

CUT AND STACK ALL TIMBER ABOVE 6-INCHES IN DIAMETER AND THICKER.

STACK BRUSH BELOW LOCATION FOR SEDIMENT CONTROL.

REFER TO THE T&S PLAN & ENGINEERED CONSTRUCTION PLANS FOR EROSION AND SEDIMENT CONTROL DEVICES AND A DETAILED SITE AND GRADING PLAN.

Detailed Sketch For Well #1410



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NORTH

### HUPP Surveying & Mapping

P.O. BOX 647 GRANTSVILLE, WV 26147  
PH: (304)354-7035 E-MAIL: hupp@frontiernet.net

1" = 2000'  
Pine Grove Quad

Triad Hunter, LLC.  
777 Post Oak Blvd. Suite 910  
Houston, TX 77056

06/13/2014



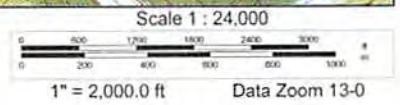
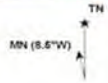
103-02995

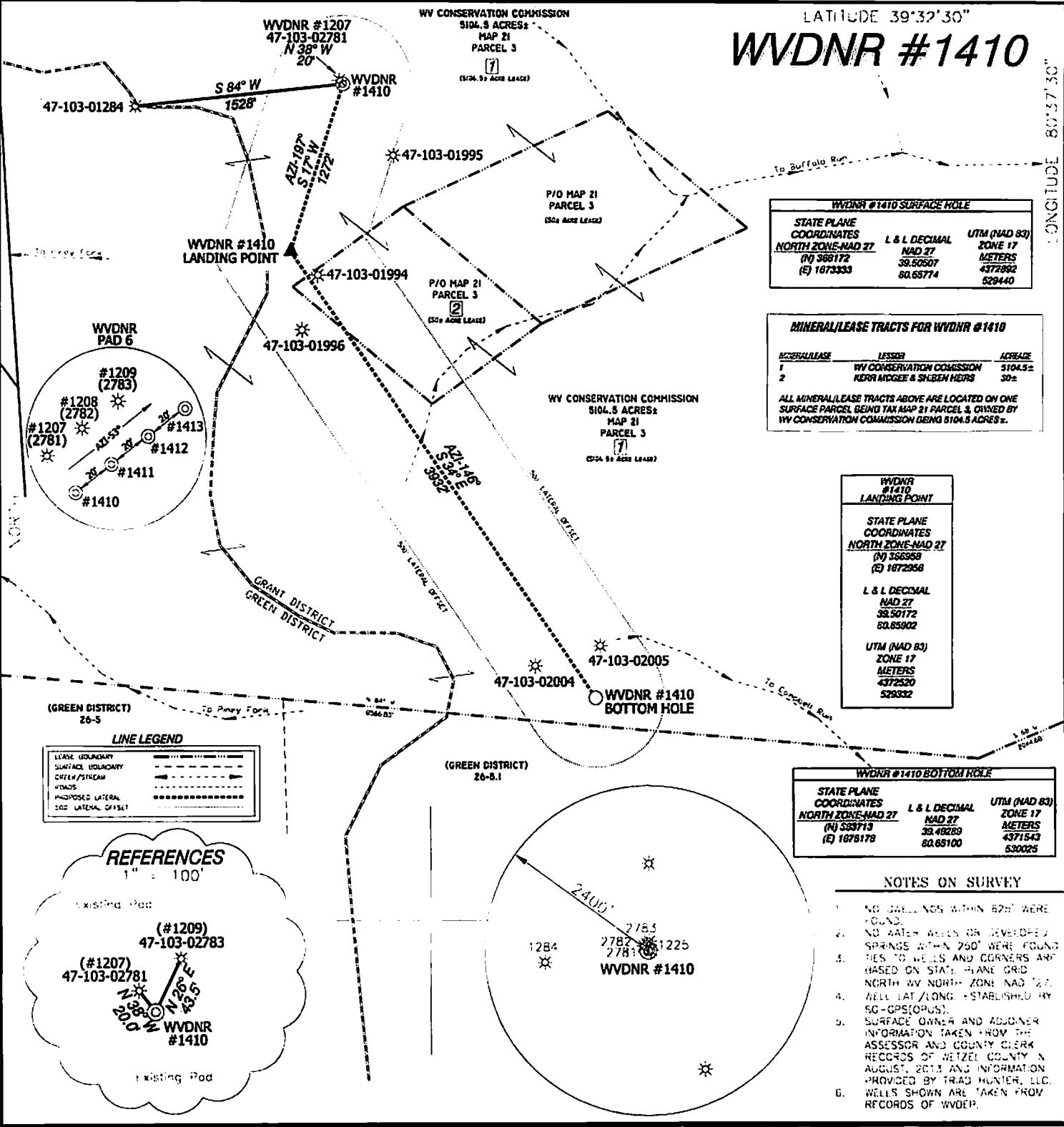


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**WVDNR #1410 SURFACE HOLE**

STATE PLANE COORDINATES NORTH ZONE-NAD 27	L & L DECIMAL NAD 27	UTM (NAD 83) ZONE 17 METERS
(N) 388172 (E) 187333	NAD 27 38.50507 80.65774	4372892 529440

**MINERAL LEASE TRACTS FOR WVDNR #1410**

MINERAL LEASE	LESSOR	ACREAGE
1	WV CONSERVATION COMMISSION	5104.5 ±
2	KERR MCGEE & SHIBEN HEIRS	5134.5 ±

ALL MINERAL LEASE TRACTS ABOVE ARE LOCATED ON ONE SURFACE PARCEL BEING TAX MAP 21 PARCEL 3, OWNED BY WV CONSERVATION COMMISSION BEING 5104.5 ACRES ±.

**WVDNR #1410 LANDING POINT**

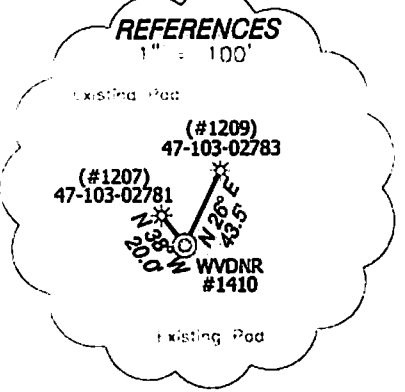
STATE PLANE COORDINATES NORTH ZONE-NAD 27	L & L DECIMAL NAD 27	UTM (NAD 83) ZONE 17 METERS
(N) 366958 (E) 1872958	NAD 27 38.50172 80.65902	4372520 529332

**WVDNR #1410 BOTTOM HOLE**

STATE PLANE COORDINATES NORTH ZONE-NAD 27	L & L DECIMAL NAD 27	UTM (NAD 83) ZONE 17 METERS
(N) 533713 (E) 1878178	NAD 27 38.48289 80.65100	4371543 530025

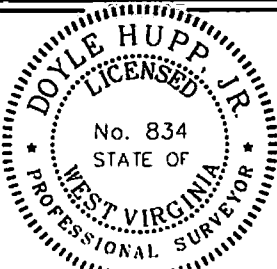
**LINE LEGEND**

LEASE BOUNDARY	---
SURFACE BOUNDARY	----
CUTLINE/STREAM	~~~~~
ROADS	=====
PROPOSED LATERAL	-----
500' LATERAL OFFSET	-----



- NOTES ON SURVEY**
- NO OBSTRUCTIONS WITHIN 825' WERE FOUND.
  - NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250' WERE FOUND.
  - IES TO WELLS AND CORNERS ARE BASED ON STATE PLANE GRID NORTH WV NORTH ZONE NAD 27.
  - WELL LAT/LONG ESTABLISHED BY SG-GPS(OPUS).
  - SURFACE OWNER AND ADJACENT INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF WETZEL COUNTY IN AUGUST, 2013 AND INFORMATION PROVIDED BY TRIAD HUNTER, LLC.
  - WELLS SHOWN ARE TAKEN FROM RECORDS OF WVDOP.

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 RULES ISSUED AND PRESCRIBED BY THE DEPARTMENT OF ENVIRONMENTAL PROTECTION.



(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
 DATE JUNE 2, 20 14  
 OPERATORS WELL NO. WVDNR #1410  
 API WELL NO. 47-103-02995 H6A  
 STATE WEST VIRGINIA COUNTY WETZEL PERMIT WV 06132014

MINIMUM DISTANCE OF ACCURACY 1/2500 FILE NO. W2102(BK58-78)  
 PROVEN SOURCE OF ELEVATION SG-GPS (OPUS) SCALE 1" = 1000'

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

WELL TYPE : OIL    GAS    LIQUID INJECTION X WASTE DISPOSAL    "GAS" PRODUCTION X STORAGE    DEEP    SHALLOW X  
 LOCATION : ELEVATION 1,455' WATERSHED TRIBUTARY OF BUFFALO RUN  
 DISTRICT GRANT COUNTY WETZEL QUADRANGLE PINE GROVE 7.5'  
 SURFACE OWNER WEST VIRGINIA CONSERVATION COMMISSION ACREAGE 5104.5 ±  
 ROYALTY OWNER MILLS WETZEL LAND Inc./SHIBEN HEIRS/KERR MCGEE LEASE ACREAGE 5134.5± LEASE NO. 06/13/2014  
 PROPOSED WORK : DRILL X CONVERT    DRILL DEEPER    REDRILL    FRACTURE OR STIMULATE X PLUG OFF OLD FORMATION    PERFORATE NEW FORMATION    PLUG AND ABANDON    CLEAN OUT AND REPLUG    OTHER     
 PHYSICAL CHANGE IN WELL (SPECIFY)    TARGET FORMATION MARCIFFUS  
 ESTIMATED DEPTH 7,500' TO 12,200' MD

OPERATOR TRIAD HUNTER, LLC DESIGNATED AGENT KIMBERLY ARNOLO  
 ADDRESS 777 POST OAK BLVD., SUITE 910, HOUSTON, TX 77056 ADDRESS P.O. BOX 154, WAVELLY, WV 26184