



**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

July 24, 2014

**WELL WORK PERMIT**

**Horizontal 6A Well**

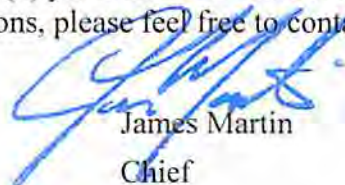
This permit, API Well Number: 47-9101302, issued to TRIANA ENERGY, LLC, is evidence of permission granted to perform the specified well work at the location described on the attached pages and located on the attached plat, subject to the provisions of Chapter 22 of the West Virginia Code of 1931, as 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: COULSON 5H  
Farm Name: NIELSON, PAUL W. & DEBORAH  
**API Well Number: 47-9101302**  
**Permit Type: Horizontal 6A Well**  
Date Issued: 07/24/2014

**Promoting a healthy environment.**

**07/25/2014**

## 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.

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### 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 within 30 days of commencement of drilling.



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

OK 12373  
5150  
378

1) Well Operator: Triana Energy, LLC      49448631      Taylor      Booth's Creek      Grafton  
Operator ID      County      District      Quadrangle

2) Operator's Well Number: Coulson 5H      Well Pad Name: Coulson

3) Farm Name/Surface Owner: Paul W. and Deborah A. Nielsen      Public Road Access: CR 12/1

4) Elevation, current ground: 1,495'      Elevation, proposed post-construction: 1,495' (existing pad)

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

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

6) Existing Pad: Yes or No Yes

7) Proposed Target Formation(s), Depth(s), Anticipated Thickness and Associated Pressure(s):  
Marcellus Shale, TVD = 7,700', Thickness = 100', Associated Pressure = 3,500#

8) Proposed Total Vertical Depth: 7,700'

9) Formation at Total Vertical Depth: Marcellus

10) Proposed Total Measured Depth: 13,675

11) Proposed Horizontal Leg Length: 5,050'

12) Approximate Fresh Water Strata Depths: 220', 400'

13) Method to Determine Fresh Water Depths: Well Records

14) Approximate Saltwater Depths: None Reported

15) Approximate Coal Seam Depths: 560', 760'

16) Approximate Depth to Possible Void (coal mine, karst, other): N/A

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)

18)

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	LS	55	60	60	Grout to surface
Fresh Water	13-3/8"	New	H-40	48	910	910	CTS
Coal	N/A						
Intermediate	9-5/8"	New	J-55	40	3,100	3,100	CTS
Production	5-1/2"	New	P-110	20	13,675	13,675	Top @ 5,150'
Tubing	2-3/8"	New	L-80	4.7	0	As Needed	None
Liners							

<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"	0.25	340	Ready-mix concrete	N/A
Fresh Water	13-3/8"	17-1/2"	0.33	1,730	Class A, w/Additives	1.18 - 1.54
Coal	N/A					
Intermediate	9-5/8"	12-3/8" - 12-1/4"	0.395	3,950	Class A, w/Additives	1.18 - 1.54
Production	5-1/2"	8-3/4" - 7-7/8"	0.361	12,360	Type 1, w/Additives	1.37 - 1.65
Tubing	2-3/8"	N/A	1.19	11,200	None	None
Liners						

PACKERS

Kind:	N/A			
Sizes:				
Depths Set:				

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WW-6B  
(9/13)

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

Drill a vertical bore hole to the kick-off point, set casing, drill a deviated bore hole to TD and set casing. Complete well in the Marcellus Shale Formation.

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

Perforate the production casing and production zone with perforating guns, at predetermined location, isolate treatment zones in stages and perform high-pressure, slick-water fracture, introducing proppant to retain fractures.

21) Total Area to be disturbed, including roads, stockpile area, pits, etc., (acres): 12.4

22) Area to be disturbed for well pad only, less access road (acres): 2.8

23) Describe centralizer placement for each casing string:

Centralizers will be used as needed. The number and type is dependent upon bore hole conditions. Rigid-style centralizers will be used in the lateral and curve sections of the well bore.

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

Cement additives will be used as needed. The amount and type is dependent on bore hole conditions. Possible additives may include" Lost Circulation Material - granular, flake or fibrous, depending on the situation; Accelerant - CaCl<sub>2</sub> up to 2%. Such additives may be used in the Fresh Water, Intermediate and Production Casing Strings, as needed.

25) Proposed borehole conditioning procedures:

Proposed bore hole conditioning procedures will depend on hole conditions. These may include, but are not limited to: weighted or high viscosity fluid sweeps, mud solvent fluid sweeps, surfactant sweeps, scouring sweeps, high rate or extended circulation, pipe rotation and reciprocation, short trips and other methods.

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\*Note: Attach additional sheets as needed.

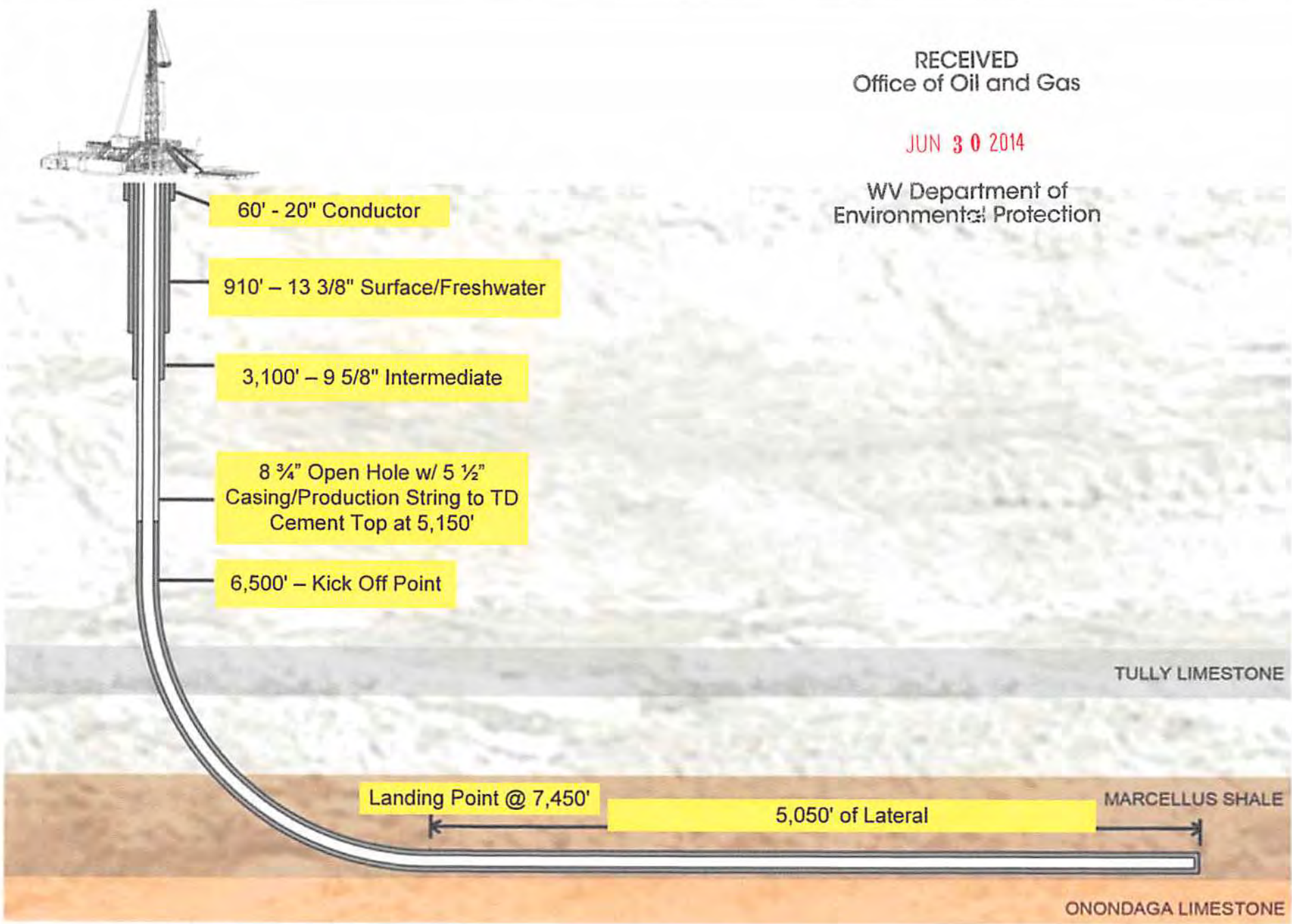
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Casing Diagram  
not to scale

Coulson 5H  
Taylor County, WV





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

FLUIDS/ CUTTINGS DISPOSAL & RECLAMATION PLAN

Operator Name Triana Energy, LLC OP Code 49448631

Watershed (HUC 10) Jack Run and Lost Run Quadrangle Grafton

Elevation 1,495' County Taylor District Booth's Creek

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 at other Coulson wells, including, 479101294 )
- Off Site Disposal (Supply form WW-9 for disposal location)
- Other (Explain \_\_\_\_\_)

Will closed loop system be used? If so, describe: Yes, mud recycling with centrifuge, cuttings drier and shaker

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

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

Additives to be used in drilling medium? Soap, potassium solution

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) \_\_\_\_\_

-Landfill or offsite name/permit number? Waste Management - Meadowfill Landfill SWF-1032

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.

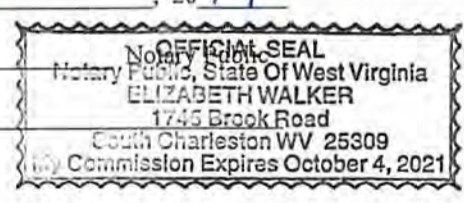
Company Official Signature *Walter C. Showen, III*

Company Official (Typed Name) Walter C. Showen, III

Company Official Title Manager of Permitting

Subscribed and sworn before me this 13<sup>th</sup> day of May, 20 14

*Elizabeth Walker*  
My commission expires 10-4-21



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Form WW-9

Operator's Well No. Coulson 5H

Triana Energy, LLC

Proposed Revegetation Treatment: Acres Disturbed 12.4 Prevegetation pH \_\_\_\_\_

Lime 2 Tons/acre or to correct to pH approx. 7

Fertilizer type 10-20-10 or equiv

Fertilizer amount 500 lbs/acre

Mulch 100 bales Tons/acre

Seed Mixtures

**Temporary**

**Permanent**

Seed Type	lbs/acre
<u>30% Annual Ryegrass, 20% Penniate Orchard</u>	
<u>10% Alsike Clover, 10% Trefoil Norcen Empire</u>	
<u>15% Climax Timothy N.C., 15% Perennial Ryegrass</u>	

Seed Type	lbs/acre
<u>30% Annual Ryegrass, 20% Penniate Orchard</u>	
<u>10% Alsike Clover, 10% Trefoil Norcen Empire</u>	
<u>15% Climax Timothy N.C., 15% Perennial Ryegrass</u>	

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: \_\_\_\_\_

Title: OIL & GAS INSPECTOR Date: 5-15-14

Field Reviewed? ( ) Yes (  ) No

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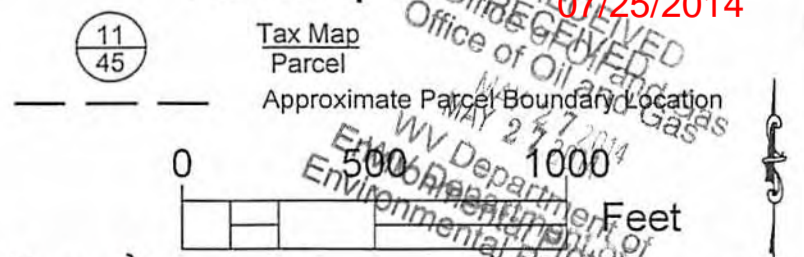


Coulson Pad Landowner Parcel Table

TM-Parcel #	Landowner	Address
8-81	Edward Rukavina	RR 3 Box 233-B Grafton, WV 26354
8-82	James Markley	RR 4 Box 14-B Grafton, WV 26354
8-82.1	Star Finley, Vicky Johnson	1336 Sutter Ct Fairfield, CA 94533
8-82.2	James Markley	RR 4 Box 14-B Grafton, WV 26354
8-83	Sidney Lantz	RR 4 Box 209 Grafton, WV 26354
8-84	Sidney Lantz	RR 4 Box 209 Grafton, WV 26354
8-86	John Musgrove	RR 3 Box 393-A Grafton, WV 26354
11-26	Kimberly Gould (Heston)	1702 Laurel Lane Fairmont, WV 26554
11-42	Kimberly Gould (Heston)	1702 Laurel Lane Fairmont, WV 26554
11-43	Leonard Vandergrift	RR 4 Box 212 Grafton, WV 26354
11-44	Janice Adams (Litzenger)	714 W Main Street Grafton, WV 26354
11-44.1	John Jeffries	595 Smith Road Flemington, WV 26347
11-44.2	Janice Adams (Litzenger)	714 W Main Street Grafton, WV 26354
11-44.3	George & Norma Linger	309 96th St. Marmet, WV 25315
11-45	Paul & Deborah Nielsen	P.O. Box 189 Ravenswood WV, 26164
11-46	Steven Musgrove	826 W Main St. Grafton, WV 26354

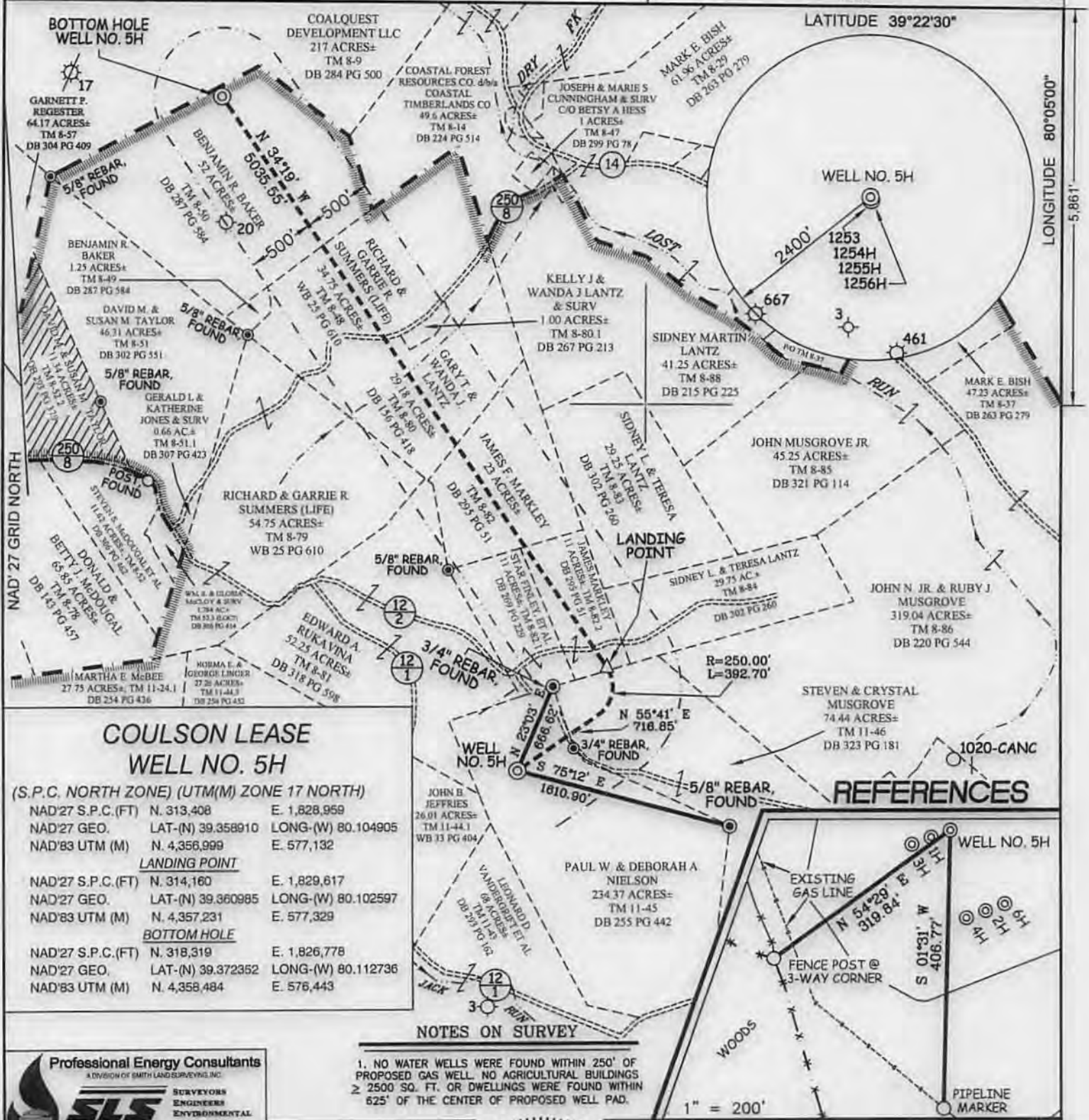
**Triana Energy  
Coulson Pad  
Site Safety & Health Plan  
Proposed Well Location  
and Parcel Data  
Taylor County, West Virginia  
Grafton Quadrangle  
Booth's Creek District (3)  
Tax Maps 8 & 11**

07/25/2014



Triana Energy, LLC  
900 Virginia Street East  
Charleston, WV 25301





**COULSON LEASE WELL NO. 5H**

(S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
 NAD'27 S.P.C.(FT) N. 313,408 E. 1,828,959  
 NAD'27 GEO. LAT-(N) 39.358910 LONG-(W) 80.104905  
 NAD'83 UTM (M) N. 4,356,999 E. 577,132

**LANDING POINT**  
 NAD'27 S.P.C.(FT) N. 314,160 E. 1,829,617  
 NAD'27 GEO. LAT-(N) 39.360985 LONG-(W) 80.102597  
 NAD'83 UTM (M) N. 4,357,231 E. 577,329

**BOTTOM HOLE**  
 NAD'27 S.P.C.(FT) N. 318,319 E. 1,826,778  
 NAD'27 GEO. LAT-(N) 39.372352 LONG-(W) 80.112736  
 NAD'83 UTM (M) N. 4,358,484 E. 576,443

**NOTES ON SURVEY**

- NO WATER WELLS WERE FOUND WITHIN 250' OF PROPOSED GAS WELL. NO AGRICULTURAL BUILDINGS ≥ 2500 SQ. FT. OR DWELLINGS WERE FOUND WITHIN 625' OF THE CENTER OF PROPOSED WELL PAD.



**Professional Energy Consultants**  
 A DIVISION OF SMITH LAND SURVEYING, INC.  
**SLS**  
 SURVEYORS  
 ENGINEERS  
 ENVIRONMENTAL  
 PROJECT MGMT.  
 (204) 422-0834 WWW.SLSURVEYS.COM

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 DIVISION OF ENVIRONMENTAL PROTECTION.

P.S. 677 *Gregory A. Smith*

MINIMUM DEGREE OF ACCURACY 1 / 200 FILE NO. 7645P5H SCALE 1" = 1,000'  
 HORIZONTAL & VERTICAL CONTROL DETERMINED BY DGPS (SURVEY GRADE TIE TO CORS NETWORK)

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

**WELL TYPE:** OIL \_\_\_\_\_ GAS  LIQUID INJECTION \_\_\_\_\_ WASTE DISPOSAL \_\_\_\_\_ IF "GAS" PRODUCTION  STORAGE \_\_\_\_\_ DEEP \_\_\_\_\_ SHALLOW

**LOCATION:**  
 ELEVATION 1,495' WATERSHED JACK RUN AND LOST RUN  
 DISTRICT BOOTH'S CREEK COUNTY TAYLOR QUADRANGLE GRAFTON 7.5'

**SURFACE OWNER:** PAUL W. & DEBORAH A. NIELSON ACREAGE 234.37±  
**ROYALTY OWNER:** ANN V. COULSON TRUST (234.37 AC±) / OCMARR LLC (74.44 AC±) / JAMES MARKLEY (11 AC± & 23 AC±) / WANDA LANTZ (29.18 AC ±)  
 JILL MATTHEWS ETAL (34.75 AC±) / BENJAMIN BAKER (52 AC ±)

**PROPOSED WORK:** LEASE NO. 07/25/2014  
 DRILL  CONVERT \_\_\_\_\_ DRILL DEEPER \_\_\_\_\_ REDRILL \_\_\_\_\_ FRACTURE OR STIMULATE  PLUG OFF OLD  
 FORMATION \_\_\_\_\_ PERFORATE NEW FORMATION \_\_\_\_\_ PLUG AND ABANDON \_\_\_\_\_ CLEAN OUT AND REPLUG \_\_\_\_\_ OTHER \_\_\_\_\_  
 PHYSICAL CHANGE IN WELL (SPECIFY) \_\_\_\_\_ TARGET FORMATION MARCELLUS  
 ESTIMATED DEPTH TVD = 7,700' TMD = \_\_\_\_\_

**WELL OPERATOR:** TRIANA ENERGY, LLC. **DESIGNATED AGENT:** RACHELLE A. KING  
**ADDRESS:** 900 VIRGINIA ST. EAST SUITE 400 **ADDRESS:** 900 VIRGINIA ST. EAST SUITE 400  
 CHARLESTON, WV 25301 CHARLESTON, WV 25301

COUNTY NAME PERMIT