

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

API 47-091-1291 County Taylor District BOOTH'S CREEK, COURT HOUSE  
Quad ROSEMONT Pad Name DUNHAM Field/Pool Name \_\_\_\_\_  
Farm name DUNHAM, MITCHELL., ET AL Well Number 4H  
Operator (as registered with the OOG) Triana Energy LLC  
Address 900 VIRGINIA STREET EAST City CHARLESTON State WV Zip 25301

As Drilled location NAD 83/UTM Attach an as-drilled plat, profile view, and deviation survey  
Top hole Northing 14286289.9 Easting 1886521.81  
Landing Point of Curve Northing 14285816.79 Easting 1886552.71  
Bottom Hole Northing 14283018.92 Easting 1890697.14

Elevation (ft) 1420 GL Type of Well  New  Existing Type of Report  Interim  Final  
Permit Type  Deviated  Horizontal  Horizontal 6A  Vertical Depth Type  Deep  Shallow  
Type of Operation  Convert  Deepen  Drill  Plug Back  Redrilling  Rework  Stimulate  
Well Type  Brine Disposal  CBM  Gas  Oil  Secondary Recovery  Solution Mining  Storage  Other \_\_\_\_\_  
Type of Completion  Single  Multiple Fluids Produced  Brine  Gas  NGL  Oil  Other \_\_\_\_\_  
Drilled with  Cable  Rotary

Drilling Media Surface hole  Air  Mud  Fresh Water Intermediate hole  Air  Mud  Fresh Water  Brine  
Production hole  Air  Mud  Fresh Water  Brine

Mud Type(s) and Additive(s)  
Synthetic oil based mud with LCM when needed

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Date permit issued 2/26/14 Date drilling commenced 4/24/14 Date drilling ceased 7/17/14  
Date completion activities began 11/1/14 Date completion activities ceased 11/6/14  
Verbal plugging (Y/N) No Date permission granted NA Granted by NA

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Please note: Operator is required to submit a plugging application within 5 days of verbal permission to plug

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Freshwater depth(s) ft none reported Open mine(s) (Y/N) depths N  
Salt water depth(s) ft none reported Void(s) encountered (Y/N) depths N  
Coal depth(s) ft 293-294,555-556,574-576, 652-653,678-683 (from 2H coal log) Cavern(s) encountered (Y/N) depths N  
Is coal being mined in area (Y/N) N

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Reviewed by:  
A.L. 5/19/15  
11/06/2015

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CASING STRINGS	Hole Size	Casing Size	Depth	New or Used	Grade wt/ft	Basket Depth(s)	Did cement circulate (Y/N) * Provide details below*
Conductor	n/a	20"	54'	New	n/a	n/a	No
Surface	17.5"	13.375"	1032'	New	H-40 (48/ft)	n/a	Yes
Coal	-	-	-	-	-	-	-
Intermediate 1	12.25"	9.625"	5860'	New	J-55 (40/ft)	n/a	Yes
Intermediate 2	-	-	-	-	-	-	-
Intermediate 3	-	-	-	-	-	-	-
Production	8.5"	5.5"	13162'	New	P110 (20/ft)	n/a	No
Tubing							
Packer type and depth set							

Comment Details \_\_\_\_\_

CEMENT DATA	Class/Type of Cement	Number of Sacks	Slurry wt (ppg)	Yield (ft <sup>3</sup> /sks)	Volume (ft <sup>3</sup> )	Cement Top (MD)	WOC (hrs)
Conductor	Class A	125	15.6	1.2	150	Surface	936
Surface	Type 1	706	15.6	1.18	833.08	Surface	8
Coal	-	-	-	-	-	-	-
Intermediate 1	Type 1 (lead)/ Type 1 (tail)	657 (lead) / 150 (tail)	15.0 (lead) / 15.6 (tail)	1.2 (lead) / 1.18 (tail)	778.4 (L) / 177 (T)	Surface	8
Intermediate 2	-	-	-	-	-	-	-
Intermediate 3	-	-	-	-	-	-	-
Production	50:50 Type 1 / Fly Ash	211 (lead) / 1782 (tail)	14.5 (lead) / 14.7 (tail)	1.2 (lead) / 1.16 (tail)	253.2 (L) / 2067.12 (T)	4528'	17
Tubing							

Drillers TD (ft) 7,569 (pilot)/13,172 (lateral)

Loggers TD (ft) 7,571 (pilot)/ n/a (lateral)

Deepest formation penetrated Huntersville (pilot)

Plug back to (ft) \_\_\_\_\_

Plug back procedure \_\_\_\_\_

Kick off depth (ft) 5798'

Check all wireline logs run

- caliper   
  density   
  deviated/directional   
  induction  
 neutron   
  resistivity   
  gamma ray   
  temperature

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Well cored  Yes  No

Conventional     Sidewall

Were cuttings collected  Yes  No

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DESCRIBE THE CENTRALIZER PLACEMENT USED FOR EACH CASING STRING \_\_\_\_\_

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WAS WELL COMPLETED AS SHOT HOLE  Yes  No    DETAILS \_\_\_\_\_

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WAS WELL COMPLETED OPEN HOLE?  Yes  No    DETAILS \_\_\_\_\_

WERE TRACERS USED  Yes  No    TYPE OF TRACER(S) USED \_\_\_\_\_

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PERFORATION RECORD

Stage No.	Perforation date	Perforated from MD ft.	Perforated to MD ft.	Number of Perforations	Formation(s)
1	11/1/14	12893	13085	60	Marcellus
2	11/2/14	12652	12840	60	Marcellus
3	11/2/14	12410	12599	60	Marcellus
4	11/3/14	12168	12357	60	Marcellus
5	11/3/14	11927	12115	60	Marcellus
6	11/3/14	11685	11874	60	Marcellus
7	11/3/14	11443	11632	60	Marcellus
8	11/4/14	11202	11390	60	Marcellus
9	11/4/14	10960	11149	60	Marcellus
10	11/4/14	10718	10907	60	Marcellus
11	11/4/14	10477	10665	60	Marcellus
12	11/5/14	10235	10424	60	Marcellus
13	11/5/14	9993	10182	60	Marcellus
14	11/5/14	9752	9940	60	Marcellus
15	11/5/14	9510	9699	60	Marcellus
16	11/5/14	9268	9457	60	Marcellus

Please insert additional pages as applicable.

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STIMULATION INFORMATION PER STAGE

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Complete a separate record for each stimulation stage.

Stage No.	Stimulations Date	Ave Pump Rate (BPM)	Ave Treatment Pressure (PSI)	Max Breakdown Pressure (PSI)	ISIP (PSI)	Amount of Proppant (lbs)	Amount of Water (bbls)	Amount of Oil Env Nitrogen/other (units)
1	11/1/14	85.7	8673	7837/9204	4649	418340	9696	0
2	11/2/14	87.6	8315	6657/8737	5237	412860	9341	0
3	11/2/14	87.0	8521	6404/9016	5840	413320	9405	0
4	11/3/14	86	8372	5863/8716	5417	387700	9037	0
5	11/3/14	87.6	8322	6115/8506	5575	411500	9507	0
6	11/3/14	86.8	8469	6134/8863	5995	410480	9133	0
7	11/3/14	85.7	8266	6083/8780	5595	404820	9217	0
8	11/4/14	86.1	8058	6458/8332	5565	406600	8489	0
9	11/4/14	87.7	8297	6310/8609	5880	410720	8412	0
10	11/4/14	86.7	8236	6111/9041	6105	409620	8374	0
11	11/4/14	85.5	7954	6005/8324	5810	412500	8613	0
12	11/5/14	85.4	7879	6406/8343	5714	405600	8382	0
13	11/5/14	84.5	7788	5978/8199	5784	407080	8532	0
14	11/5/14	85.4	8320	6515/8483	5799	415960	8743	0
15	11/5/14	85.4	8095	6514/8447	6326	408580	8422	0
16	11/5/14	86.8	8126	6548/8383	6001	409600	8225	0

Please insert additional pages as applicable.

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PRODUCING FORMATION(S)	DEPTHS	
Marcellus	7,539-7,788	8,060-13,085
	TVD	MD

Please insert additional pages as applicable.

GAS TEST  Build up  Drawdown  Open Flow OIL TEST  Flow  Pump  
 SHUT-IN PRESSURE Surface \_\_\_\_\_ psi Bottom Hole \_\_\_\_\_ psi DURATION OF TEST \_\_\_\_\_ hrs  
 OPEN FLOW Gas \_\_\_\_\_ Oil \_\_\_\_\_ NGL \_\_\_\_\_ Water \_\_\_\_\_ GAS MEASURED BY  
 \_\_\_\_\_ mcfpd \_\_\_\_\_ bpd \_\_\_\_\_ bpd \_\_\_\_\_ bpd  Estimated  Orifice  Pilot

LITHOLOGY/ FORMATION	TOP DEPTH IN FT NAME TVD	BOTTOM DEPTH IN FT TVD	TOP DEPTH IN FT MD	BOTTOM DEPTH IN FT MD	DESCRIBE ROCK TYPE AND RECORD QUANTITY AND TYPE OF FLUID (FRESHWATER, BRINE, OIL, GAS, H <sub>2</sub> S, ETC)
	0		0		
Lower Kittanning	678	683	678	683	Coal
Little Lime	1225	1269	1225	1269	
Big Lime	1269	1405	1269	1405	
Big Injun	1405	1437	1405	1437	
Gantz/50-Foot	1807	1890	1807	1890	
5th Sand	2334	2381	2334	2381	
Benson	4323	4373	4323	4373	
Sycamore	6569	6658	6651	6758	
Tully	7207	7270	7338	7414	
Marcellus	7410	7793	7634	13171 (MTD)	GAS
Marcellus (pilot)	7413	7556	7413	7556	
Onondaga (pilot)	7556	7568	7556	7568	
Huntersville (pilot)	7568	7571	7568	7571	

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Please insert additional pages as applicable.

Drilling Contractor Pioneer Energy Resources  
 Address 5205 North O'Connor Blvd City Irving State Texas Zip 75039

Logging Company Baker Hughes (pilot hole log)  
 Address 1807 Allen Ave SE #19 City Canton State OH Zip 44707

Cementing Company Universal Well Services, Inc.  
 Address Route 5 Hall Road City Buckhannon State WV Zip 26201

Stimulating Company Universal Well Services, Inc.  
 Address 124 Industrial Drive City Bradford State PA Zip 16701

Please insert additional pages as applicable.

Completed by Rachelle A. King Telephone 304-205-8560  
 Signature Rachelle A. King Title Director of Regulatory Affairs Date 2/19/15

Submittal of Hydraulic Fracturing Chemical Disclosure Information Attach copy of FRACFOCUS Registry

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# Hydraulic Fracturing Fluid Product Component Information Disclosure

Job Start Date:	11/1/2014
Job End Date:	11/6/2014
State:	West Virginia
County:	Taylor
API Number:	47-091-01291-00-00
Operator Name:	Triana Energy
Well Name and Number:	Dunham 4H
Longitude:	-80.12978000
Latitude:	39.33623000
Datum:	NAD27
Federal/Tribal Well:	NO
True Vertical Depth:	7,985
Total Base Water Volume (gal):	7,869,120
Total Base Non Water Volume:	

## Hydraulic Fracturing Fluid Composition:

Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Triana Energy	Carrier/Base Fluid	Water	7732-18-5	100.00000	87.75119	
Sand (Proppant)	Universal Well Services	Proppant	Crystalline Silica in the form of Quartz	14808-60-7	99.90000	11.44583	
Hydrochloric Acid (7.5%)	Universal Well Services	Acidizing	Other - (non-hazardous)	NA	92.50000	0.65696	
			Hydrochloric Acid	7647-01-0	7.50000	0.05327	
Ingredients shown above are subject to 29 CFR 1910.1200(f) and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are Non-MSDS.							
Unislick ST-50	Universal Well Services	Friction Reducer	Other - (non-hazardous)	NA	70.00000	0.04824	
			Petroleum Distillates, Hydro-treated Light	64742-47-8	30.00000	0.02068	
B-84	XChem	Biocide	Glutaraldehyde	111-30-8	27.00000	0.00953	
			Didecyl Dimethyl Ammonium Chloride	7173-51-5	8.00000	0.00282	
			n-Alkyl Dimethyl Benzyl Ammonium Chloride	68424-85-1	5.50000	0.00194	
			Ethanol	64-17-5	4.00000	0.00141	

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FS-30	XChem	Scale Inhibitor	Sodium Polyacrylate	9003-04-7	30.00000	0.00278
Unith G	Universal Well Services	Acid Inhibitor	Short Chained Glycol Ether	112-34-5	60.00000	0.00038
			Ethoxylated Alcohol	98002-97-1	35.00000	0.00022
			Methanol	67-56-1	5.00000	0.00003
			Acetophenone	98-86-2	1.00000	0.00001
			Formaldehyde	50-00-0	1.00000	0.00001
			Thiourea	62-56-6	1.00000	0.00001

\* Total Water Volume sources may include fresh water, produced water, and/or recycled water  
 \*\* Information is based on the maximum potential for concentration and thus the total may be over 100%

Note: For Field Development Products (products that begin with FDP), MSDS level only information has been provided.  
 Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)

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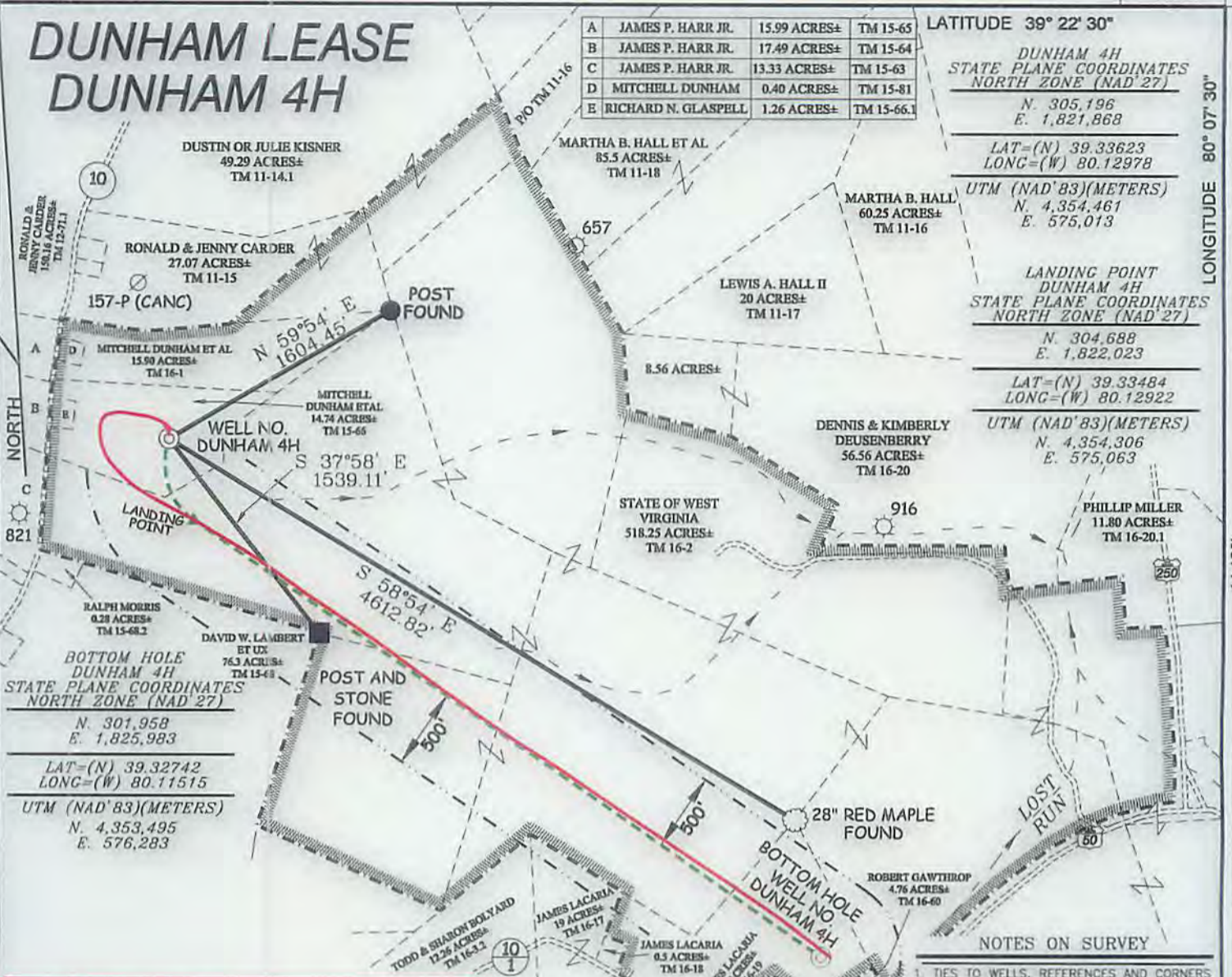
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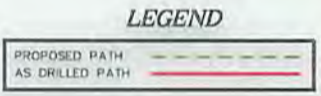
# DUNHAM LEASE DUNHAM 4H



LATITUDE 39° 22' 30"  
 DUNHAM 4H  
 STATE PLANE COORDINATES  
 NORTH ZONE (NAD'27)  
 N. 305,196  
 E. 1,821,868  
 LAT=(N) 39.33623  
 LONG=(W) 80.12978  
 UTM (NAD'83)(METERS)  
 N. 4,354,461  
 E. 575,013  
 LANDING POINT  
 DUNHAM 4H  
 STATE PLANE COORDINATES  
 NORTH ZONE (NAD'27)  
 N. 304,688  
 E. 1,822,023  
 LAT=(N) 39.33484  
 LONG=(W) 80.12922  
 UTM (NAD'83)(METERS)  
 N. 4,354,306  
 E. 575,063

**AS DRILLED COORDINATES  
FOR WELL NO. DUNHAM 4H**  
 (S.P.C. NORTH ZONE) (UTM(M) ZONE 17 NORTH)  
 NAD27 S.P.C.(FT) N. 305,226 E. 1,821,868  
 NAD27 GEO. LAT=(N) 39.33631 LONG=(W) 80.12978  
 NAD83 UTM (M) N. 4,354,470 E. 575,013  
**BOTTOM HOLE**  
 NAD27 S.P.C.(FT) N. 301,955 E. 1,826,043  
 NAD27 GEO. LAT=(N) 39.32741 LONG=(W) 80.11494  
 NAD83 UTM (M) N. 4,353,494 E. 576,302

- NOTES ON SURVEY**
- TIES TO WELLS, REFERENCES AND CORNERS ARE BASED ON GRID NORTH FOR THE WV STATE PLANE COORDINATE SYSTEM NORTH ZONE NAD '27
  - LEASE BOUNDARY SHOWN HEREON TAKEN FROM MULTIPLE DEEDS PROVIDED BY TRIANA ENERGY LLC AND VARIOUS WELL PLATS.
  - SURFACE OWNER AND ADJOINER INFORMATION TAKEN FROM THE ASSESSOR AND COUNTY CLERK RECORDS OF TAYLOR COUNTY IN JULY, 2013.
  - WELL LAT./LONG. (NAD'27) ESTABLISHED BY DGPS(SURVEY GRADE)
  - NO DWELLINGS OR AGRICULTURAL BUILDINGS WITHIN 625 FEET OF CENTER OF PAD. NO WATER WELLS OR DEVELOPED SPRINGS WITHIN 250 FEET OF PROPOSED WELL. NO PERENNIAL STREAMS, LAKES, PONDS, RESERVOIRS OR WETLANDS WITHIN 100 FEET OF THE PAD LIMITS OF DISTURBANCE.
  - AS DRILLED INFORMATION PROVIDED BY TRIANA ENERGY, LLC.
  - THIS PERMITTED PLAT REVISED TO SHOW THE AS DRILLED PATH AND COORDINATES RELATIVE TO THE PROPOSED WELL.



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. *Matthew J. Hilton, Jr.*  
 2294

(+) DENOTES LOCATION OF WELL ON UNITED STATES TOPOGRAPHIC MAPS.  
 DATE DECEMBER 17, 20 13  
 REVISED JULY 29, 20 15  
 OPERATORS WELL NO. DUNHAM 4H  
 API WELL NO. 47 - 091 - 01291H  
 STATE COUNTY PERMIT

MINIMUM DEGREE OF ACCURACY 1/200 FILE NO. 7754AD4H  
 PROVEN SOURCE OF ELEVATION DGPS (SURVEY GRADE GPS TIES TO COORS) SCALE 1" = 1000'

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 1,420' WATERSHED TRIBUTARY OF LOST RUN  
 DISTRICT BOOTH'S CREEK COUNTY TAYLOR QUADRANGLE ROSEMONT 7.5'

SURFACE OWNER MITCHELL DUNHAM ET AL ACREAGE 14.74±  
 ROYALTY OWNER MITCHELL DUNHAM ET AL (14.74 & 15.90 AC.±) AND W.V. DEPT. OF AGRICULTURAL (518.25 AC.±) MITCHELL CARL DUNHAM (1.26 AC.±)

PROPOSED WORK: LEASE NO. \_\_\_\_\_  
 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 7,800' / TMD

WELL OPERATOR TRIANA ENERGY, L.L.C. DESIGNATED AGENT RACHELLE A. KING  
 ADDRESS 900 VIRGINIA STREET EAST, SUITE 400 ADDRESS 900 VIRGINIA STREET EAST, SUITE 400  
CHARLESTON, WV 25301 CHARLESTON, WV 25301

11/06/2015

COUNTY NAME  
 PERMIT