

State of West Virginia  
Department of Environmental Protection  
Office of Oil and Gas

Well Operator's Report of Well Work

Farm name: George Scott Operator Well No.: HR 490

LOCATION: Elevation: 682' Quadrangle: Reedy WV 7.5'

District: Reedy County: Roane

Latitude: 11055' Feet South of 38 Deg. 55 Min. 00 Sec.

Longitude 9301' Feet West of 81 Deg. 22 Min. 30 Sec.

Company: Hard Rock Exploration

	Casing & Tubing	Used in drilling	Left in well	Cement fill up Cu. Ft.
Address: 1244 Martins Branch Road Charleston WV, 25312	20"	20'	20'	N/A
Agent: Marc Scholl	13 3/8"	86'	86'	51ft3 CTS
Inspector: Ed Garner	9 5/8"	580'	580'	300ft3 CTS
Date Permit Issued: 12/18/12	7"	2329'	2329'	534ft3 CTS
Date Well Work Commenced: 1/29/13	4.5"	7419'	7419'	123 ft3
Date Well Work Completed: 2/25/13				
Verbal Plugging:	Gamma Log from (3500' MD, 4500'TVD)			
Date Permission granted on:	Ran Gyro Log from (3500' - Surface)			
Rotary x Cable Rig				
Total Depth (feet): 7519'TMD, 4232'TVD				
Fresh Water Depth (ft.): 37'				
Salt Water Depth (ft.): 1333', 1523				
Is coal being mined in area (N/Y)? N				
Coal Depths (ft.): N/A				

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OPEN FLOW DATA

Producing formation Lower Huron Shale Pay zone depth (ft) 4154'MD- 7519'MD  
4089'TVD - 4232' TVD

Gas: Initial open flow Trace MCF/d Oil: Initial open flow        Bbl/d

Final open flow >2 MMCF/d Final open flow        Bbl/d

Time of open flow between initial and final tests 72 Hours

Static rock Pressure        psig (surface pressure) after        Hours

Second producing formation        Pay zone depth (ft)       

Gas: Initial open flow        MCF/d Oil: Initial open flow        Bbl/d

Final open flow        MCF/d Final open flow        Bbl/d

Time of open flow between initial and final tests        Hours

Static rock Pressure        psig (surface pressure) after        Hours

NOTE: ON BACK OF THIS FORM PUT THE FOLLOWING: 1). DETAILS OF PERFORATED INTERVALS, FRACTURING OR STIMULATING, PHYSICAL CHANGE, ETC. 2). THE WELL LOG WHICH IS A SYSTEMATIC DETAILED GEOLOGICAL RECORD OF ALL FORMATIONS, INCLUDING COAL ENCOUNTERED BY THE WELLBORE.

Signed:

By: James J. [Signature]  
President

Date: 5/17/2013

<b>Formation:</b>	<b>Top:</b>	<b>Bottom:</b>
Soil/Sand/Shale	0	1550
Salt Sand	1550	1772
Big Lime	1772	1817
Big Injun	1817	1840
Dev. Shale	1840	2234
Coffee Shale	2234	2248
Devonian Shale	2248	4232
Lower Huron Section	4070	4232

87.04727

**All depths shown As TVD**

2/6/13

Run 4.5" R-3 11.6ppg m-80 casing (183 jts) with 14 stg Packers Plus mechanical packer system to depth of 7419' KB. Land casing hanger w/8" 11.6ppf nipple. Drop 5 bbl water and 2 balls for pump out shoe. Land balls at 7500 scf/min and pressure up to 3100 psi. Pumped 145k scf N2. Finish at 5:40am – hold pressure for 20 min. Packers shut off gas rate. RU to perform annular cmt squeeze. Pump 5 bbls type 1 3% CaCl, let air out, pump 10 bbls, and then 7.5 bbls at 15 ppg (total 22.5 bbls cmt). Follow cmt with 3 bbls water.

NOTE: THERE ARE NO PERFORATED INTERVALS IN THIS STYLE OF COMPLETION. THE PACKERS WILL SERVE AS STAGE ISOLATION AND THE BALL ACTIVATED MECHANICAL SLEEVES SERVE AS THE MEANS OF COMMUNICATION FROM WELLBORE TO FORMATION. ALL DEPTHS ARE INDICATED BELOW.

Stage	Sleeve	Sleeve ID	Ball Size	Packer
1	7419.00	P/O Shoe	N/A	7242.42
2	7156.08	1.500	1.625	7025.37
3	6934.23	1.625	1.875	6793.23
4	6666.89	1.875	2.125	6538.88
5	6412.34	2.125	2.250	6315.71
6	6180.16	2.250	2.375	6083.56
7	5962.31	2.375	2.500	5834.80
8	5718.35	2.500	2.625	5595.12
9	5472.47	2.625	2.750	5335.57
10	5204.32	2.750	2.875	5111.92
11	4986.17	2.875	3.000	4874.26
12	4741.41	3.000	3.250	4622.81
13	4513.46	3.250	3.500	4390.46
14	4278.11	3.500	3.750	4154.01
Anchor				2632.00

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02/21/13

MIRU Nabors Stim crew. Pump at 24k scf/min and open Stg 1 shoe at 5324 psi. Slowly increase rate and pump total of 1MM scf N2. Shut down and load balls. Drop 1.625" ball for Stg 2. Start pumping ball down at 20k scf/min. Land ball at 145k scf. Continue pumping and open sleeve at 4572 psi. Up rate and pump total of 1MM scf N2. Back rate down to 4k scf/min and drop 1.875" ball for Stg 3. Pump ball to sleeve at 22k scf/min and land ball at 140k scf N2. Up rate and open sleeve at 4181 psi. Up rate and pump total of 1MM scf N2. Repeat process for STGs 4 – Stg 14.

	Stg1	Stg2	Stg3	Stg4	Stg5	Stg6	Stg7	Stg8	Stg9	Stg10	Stg11	Stg12	Stg13	Stg14
Max P	5784	5836	5698	5848	5759	5848	5688	5855	5608	5897	5865	5850	5402	4745
Avg P	5717	5714	5620	5575	5636	5754	5527	5768	5405	5795	5586	5808	5368	4700
MaxR	69.2	90.8	86.6	101.6	95.6	95.5	101.2	102	106	100	100	90.1	104	107.7
Avg R	67.4	88	85.2	99.4	95.2	91.2	96.2	96.1	105.9	94	98.9	89.1	103	106
Shut in	3990- instant	N/A	N/A	2441- 5min	N/A	N/A	2449- 5min	N/A	N/A	2379- 5min	N/A	N/A	2240 8min	1989- 5min

06/21/2013