

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

PERMIT MODIFICATION APPROVAL

May 14, 2014

EQT PRODUCTION COMPANY POST OFFICE BOX 280 BRIDGEPORT, WV 26330

Re: Permit Modification Approval for API Number 1706323 , Well #: WV 513343 Modified Casing

Oil and Gas Operator:

The Office of Oil and Gas has reviewed the attached permit modification for the above referenced permit. The attached modification has been approved and well work may begin. Please be reminded that the oil and gas inspector is to be notified twenty-four (24) hours before permitted well work is commenced.

Please call James Martin at 304-926-0499, extension 1654 if you have any questions.

Gene Smith

Regulatory/Compliance Manager

Office of Oil and Gas



May 13, 2014

Mr. Gene Smith
West Virginia Department of Environmental Protection
Office of Oil and Gas
601 57th Street SE
Charleston, WV 25304

Re: Casing Modification on 47-017-06325 & 47-017-06323

Dear Mr. Smith,

Attached is a casing modification for the above wells on the WEU6 pad. EQT had previously permitted the intermediate casing depth for 5400' (modification) because of losses on nearby locations. EQT has been able to prove that the formation will hold 12.5 ppg fluid and we are requesting that the intermediate depth be changed to 3100', which was originally permitted for these wells. The inspector, Douglas Newlon, has verbally approved the change and is being copied on this modification.

If you have any questions, please do not he sitate to contact me at (304) 848-0076.

Sincerely,

Vicki Roark

Permitting Supervisor-WV

Enc.

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STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND GAS W.YA. CODE \$22-5A - WELL WORK PERMIT APPLICATION

1) Well Operator: EQT Production Com	pany		017	8	671
	and the same of th	Operator ID	County	District	Quadrangle
2) Operator's Well Number:	513343		Well Pad Nar	me	WEU6
3) Farm Name/Surface Owner :	Maxwell		_ Public Road	Access:	Rt. 50
4) Elevation, current ground: 1,266.0	Eleva	tion, proposed	post-construction	n: 1,261.	.0
5) Well Type: (a) Gas C	OilUr	derground Stor	age		
Other					
(b) If Gas: Shallow	·	Deep			
Harizont	al				
T) F. Lal D. 40 V					
5) Existing Pad? Yes or No: yes	, Anticipated Thic				
7) Proposed Target Formation(s), Depth(s) Target formation is Marcellus at a depth	, Anticipated Thic		be 110 feet and ant		sure of 4616 PSI
7) Proposed Target Formation(s), Depth(s) Target formation is Mercellus at a depth 3) Proposed Total Vertical Depth:	, Anticipated Thic		be 110 feet and ant		sure of 4616 PSI
7) Proposed Target Formation(s), Depth(s) Target formation is Mercellus at a depth 3) Proposed Total Vertical Depth: 3) Formation at Total Vertical Depth:	, Anticipated Thic		6,900 Marcellus		sure of 4616 PSI
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CASING AND TUBING PROGRAM

TYPE	Size	New or Used	Grade	Weight per	FOOTAGE: for Drilling	INTERVALS: Left in Well	CEMENT: Fill- up (Cu.Ft.)
Conductor	20	New	MC-50	81	40	40	38
Fresh Water	13 3/B	New	MC-50	54	1,134	1,134	980
Coal		•			-	-	1
Intermediate	9 5/8	New	MC-50	40	3,100	3,100	1,207
Production	5 1/2	New	P-110	20	15,271	15,271	See Note 1
Tubing	2 3/8		J-55	4.6			May not be run. If run will be set 100' less than TD
Liners							

TYPE	Size	Wellbore Diameter	<u>Wall</u> Thickness	Burst Pressure	Cement Type	Cement Yield (cu. lt./k)
Conductor	20	24	0.635		Construction	1.18
Fresh Water	13 3/8	17 1/2	0.38	2,480	1	1.21
Coal			•	•	-	
intermediate	9 5/8	12 3/8	0.395	3,590	1	1.21
Production	5 1/2	8 1/2	0.361	12,640		1.27/1.86
Tubing						
Liners						

Packers

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

Note 1: EQT plans to bring the TOC on the production casing cement job 1,000' above kick off point, which is at least 500' above the shallowest production zone, to avoid communication.

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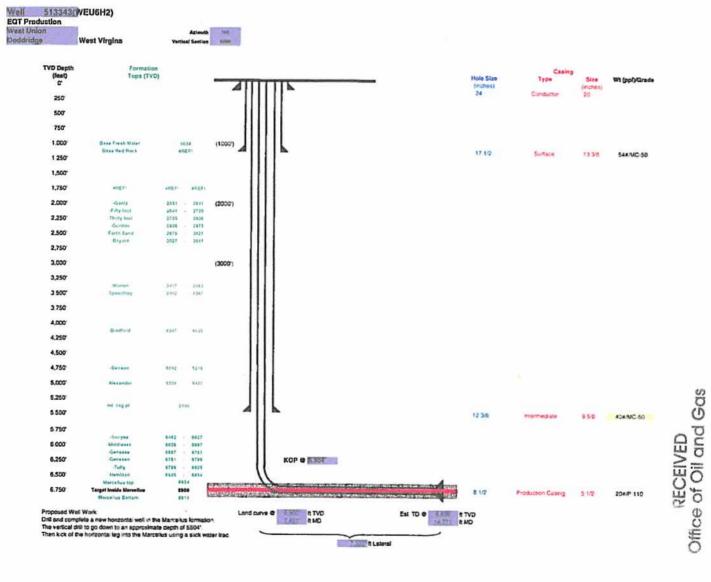
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(3/13)

22) Area to be disturbed for well pad only, less access road (acres). 23) Describe centralizer placement for each casing string. Surface: Bow spring centralizers — One at the shoe and one spaced every 500'. Intermediate: Bow spring centralizers— One cent at the shoe and one spaced every 500'. Production: One spaced every 1000' from KOP to Int csg shoe 24) Describe all cement additives associated with each cement type. Surface (Type 1 Cement): 0-3% Calcium Chloride Used to speed the setting of cement shurrles. A.% (lake, Loss Circulation Material (LCM) is used to combat the loss of the cement slurry to a thief zone. Intermediate (Type 1 Cement): 0-3% Calcium Chloride. Salt is used in shallow, low temperature formations to speed the setting of cement shurries, 0-4% (lake, Loss Circulation Material (LCM) is used to combat the loss of whole drilling fluid or cement slurry (not filtrate) to a thief zone. Production: Lead (Type 1 Cement): 0.2-0.7% Ugnosulfonate (Retarder). Lengthens thickening time. 0.2-0.3% CFR (dispersant). Makes cement easier to mix. Tall (Type H Cement): 0.25-0.40% Lignosulfonate (Retarder). Lengthens thickening time. 0.2-0.3% CFR (dispersant). This is to make the cement easier to mix. 10.4-0.6% Halad (fluid loss). Reduces amount of water lost to formation.	kick off the horizontal leg into the marcellus using a slick water frac	
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Intermediate: Circulate hole clean (Approximately 30-45 minutes) rotating & reciprocating one full joint until cuttings diminish at surface. When cuttings returning to surface diminish, continue to circulate an editional 5 minutes. If foam drilling, to enhance ole cleaning use a soap sweep or increase injection rate & foam concentration. **Traduction: Pump marker sweep with nut plug to determine actual hole washout. Calculate a gauge holes bottoms up volume. **Terform a cleanup cycle by pumping 3-5 bottoms up or until the shakers are clean. Check volume of cuttings coming across he shakers every 15 minutes. **Note: Attach additional sheets as needed.** **PECEIVED**		
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