

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

December 05, 2014

WELL WORK PERMIT Horizontal 6A Well

This permit, API Well Number: 47-4105690, issued to EQT PRODUCTION COMPANY, 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: 514168

Farm Name: HORNER, WILLIAM & MARY ET

API Well Number: 47-4105690

Permit Type: Horizontal 6A Well

Date Issued: 12/05/2014

API Number: 41-05690

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. <u>Failure to adhere to the specified permit conditions may result in enforcement action.</u>

CONDITIONS

- 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 W.VA. CODE §22-6A - WELL WORK PERMIT APPLICATION

1) Well Operator: EQT Produc	tion Company		306686	041	2	542	7
* :			Operator ID	County	District	Quadrangle	-
2) Operator's Well Number:	5	4168		_Well Pad Name	PE	T35	_
3) Farm Name/Surface Owner :	William &	Mary Hor	ner et al	_Public Road Ac	cess:	Rt 17	_,
4) Elevation, current ground:	1,161.0	Elevati	ion, proposed p	ost-construction:	1,155.8		
5) Well Type: (a) Gas	Oil	Und	derground Stora	age			
Other							= ;
(b) If Gas:	Shallow		Deep				
	Horizontal	· · · · · · · · · · · · · · · · · · ·					
6) Existing Pad? Yes or No:	no					~	= 0
7) Proposed Target Formation(s),	Depth(s), Anticipa	ated Thick	nesses and As	sociated Pressure	e(s):		5000 12/11/2012
Target formation is Marcellu	s at a depth of 7446' w	ith the antici	pated thickness to I	be 64' feet and anticip	ated target pressure	ot 3109 PSI	-21112012
8) Proposed Total Vertical Depth:		-		7,446			_1;
9) Formation at Total Vertical Dep				Marcellus			
10) Proposed Total Measured De				17,923			
11) Proposed Horizontal Leg Len				8,790			_
12) Approximate Fresh Water Str	ata Depths:			131, 195, 263,	313		
13) Method to Determine Fresh V	/ater Depth:			By offset wel	ls		_;
14) Approximate Saltwater Depth	s:			n/a			=: =:
15) Approximate Coal Seam Dep				260, 674, 899, 104	41, 1109		
16) Approximate Depth to Possib		karst, oth	ner):		None reporte	d	
17)Does proposed well location							
adjacent to an active mine?							
(a) If Yes, provide Mine Info:	Name:						
3. 7.							_
	0						<u>-</u> ,
	Owner:						_

Page 1 of 3

Received Office of Oil & Gas DEC 0 4 2014



August 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 on Wells 514167, 514168, 514169, 514170, 514171, 514172 (PET35)

Dear Mr. Smith,

EQT is requesting the 13-3/8" surface casing be set at 939' KB, 50' below a red rock formation. This will cover up red rock formations that have given EQT drilling issues in the past. We will set the 9-5/8" intermediate string at 3189' KB, 50' below the porosity zone in the Bayard formation.

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

Sincerely,

Vicki Roark

Permitting Supervisor

Enc.

12/05/2014 RECEIVED Office of Oil and Gas

AUG 1 5 2014

WV Department of Environmental Protection WW - 6B (3/13)

CASING AND TUBING PROGRAM

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_		1.7

TYPE	Size	New	Grade	Weight per	FOOTAGE:	INTERVALS:	CEMENT:
		<u>or</u> Used		<u>ft.</u>	for Drilling	Left in Well	Fill- up (Cu.Ft.)
Conductor	20	New	MC-50	81	40	40	38 C.T.S.
Fresh Water	13 3/8	New	MC-50	54	939	939	817 C.T.S.
Coal							
Intermediate	9 5/8	New	MC-50	40	3,189	3,189	1,248 C.T.S.
Production	5 1/2	New	P-110	20	17,923	17,923	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							

5000 wal1/14

TYPE	Size	Wellbore Diameter	<u>Wall</u> <u>Thickness</u>	<u>Burst</u> <u>Pressure</u>	Cement Type	Cement Yield (cu. ft./k)
Conductor	20	24	0.375	-	Construction	1.18
Fresh Water	13 3/8	17 1/2	0.38	2,480	* See Note 2	1.21
Coal			4			
Intermediate	9 5/8	12 3/8	0.395	3,590	* See Note 2	1.21
Production	5 1/2	8 1/2	0.361	12,640	14.1	1.27/1.86
Tubing						
Liners						

<u>Packers</u>

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

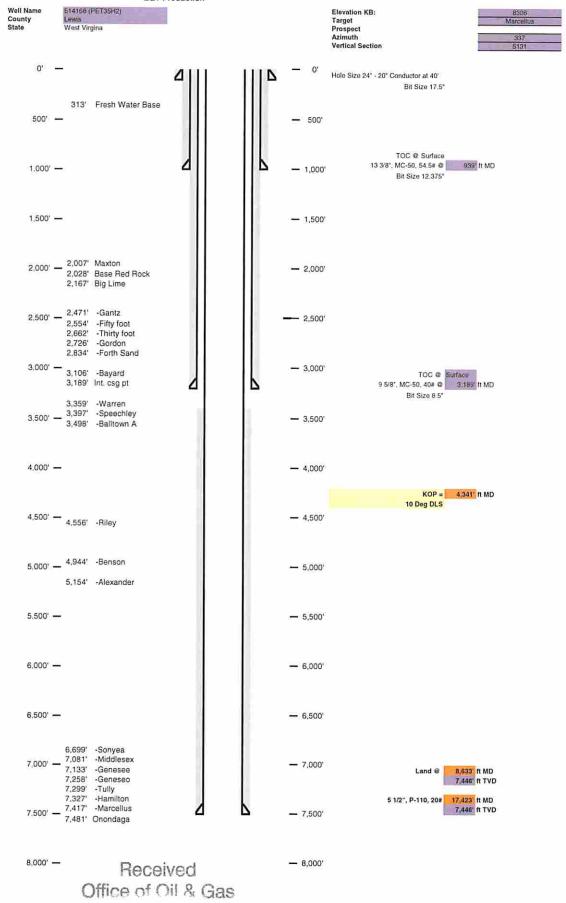
Note 1: EQT plans to bring the TOC on the production casing cement job 1,000' above kick off point, which is at least 500' above the shallowest production zone, to avoid communication.

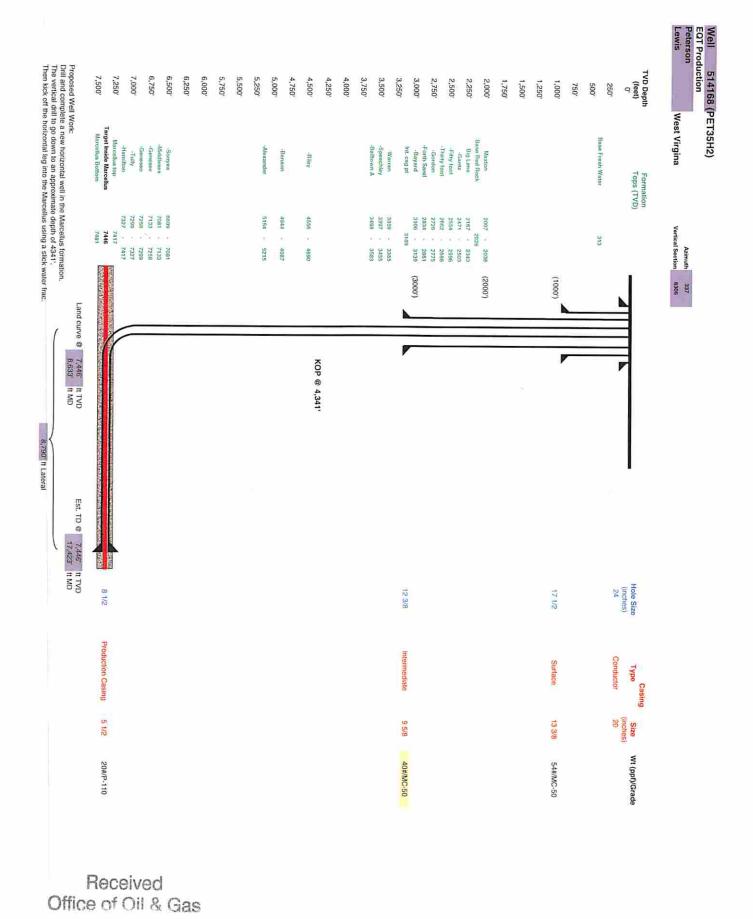
Note 2: Reference Variance 2014-17.

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Received Office of Oil & Gas DEC 0 4 2014 Well Schematic EQT Production

DEC 0 4 2014





DEC 0 4 2014

(3/13)

19) Describe proposed well work, including the drilling and plugging back of any pilot hole:
Drill and complete a new horizontal well in the marcellus formation. The vertical drill to go down to an approximate depth of 4341 then kick off
the horizontal leg into the marcellus using a slick water frac.
20) Describe fracturing/stimulating methods in detail, including anticipated max pressure and max rate:
Hydraulic fracturing is completed in accordance with state regulations using water recycled from previously fractured wells and obtained from freshwater sources. This water is mixed with sand and a small percentage (less than 0.3%) of chemicals (including 15% Hydrochloric acid,
gelling agent, gel breaker, friction reducer, biocide, and scale inhibitor), referred to in the industry as a "slickwater" completion. Maximum
anticipated treating pressures are expected to average approximately 8500 psi, maximum anticipated treating rates are expected to average
approximately 100 bpm. Stage lengths vary from 150 to 300 feet. Average approximately 200,000 barrels of water per stage. Sand sizes vary from 100 mesh to 20/40 mesh. Average approximately 200,000 pounds of sand per stage.
The state of the s
21) Total area to be disturbed, including roads, stockpile area, pits, etc, (acres): 29.19
22) Area to be disturbed for well pad only, less access road (acres): 20.96
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 compart additives appearated with each compart time.
24) Describe all cement additives associated with each cement type. Used to speed the setting of cement slurries. Surface (Type 1 Cement): 0-3% Calcium Chloride
0.4% flake. 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 slurries. 0.4% flake. 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% Lignosulfonate (Retarder). Lengthens thickening time.
0.3% CFR (dispersant). Makes cement easier to mix.
Tail (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.
60 % Calcuim Carbonate. Acid solubility.
0.4-0.6% Halad (fluid loss). Reduces amount of water lost to formation.
25) Proposed borehole conditioning procedures. <u>Surface</u> : 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 additional 5
minutes. To ensure that there is no fill, short trip two stands with no circulation. If there is fill, bring compressors back on
and circulate hole clean. A constant rate of higher than expected cuttings volume likely indicates washouts that will not clean up.
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 additional 5 minutes. If foam drilling, to enhance
hole cleaning use a soap sweep or increase injection rate & foam concentration.
<u>Production:</u> Pump marker sweep with nut plug to determine actual hole washout. Calculate a gauge holes bottoms up volume.
Perform a cleanup cycle by pumping 3-5 bottoms up or until the shakers are clean. Check volume of cuttings coming across
the shakers every 15 minutes.
·
*Note: Attach additional sheets as needed. Received

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Office of Oil & Gas



west virginia department of vironmental protection

Office of Oil and Gas 601 57th Street, SF, Charleston, WV 25304 (304) 926-0450 (304) 926-0452 fax

Earl Ray Tomblin, Governor Randy C. Huffman, Cabinet Secretary dep.wv.gov

March 18, 2014

Nabors Completion & Production Services Company 1380 Route 286 Hwy E #121 Indiana PA 15701

Re: Cement Variance Request

Dear Sir or Madam,

This agency is approving a variance request for the cement blend listed below to be used on surface and coal protection strings for the drilling of oil and gas wells in the state of West Virginia. The variance cannot be used without requesting its use on a permit application and approval by this agency:

Type I (2% Calcium Chloride-Accelerator, 0.25% Super Flake-Lost Circulation, 5.2% Water, 94% Type "1" Cement)

If you have any questions regarding this matter feel free to contact me at 304-926-0499, ext. 1653.

Environmental Resources Specialist / Permitting

Promoting a healthy environment

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AUG 1 5 2014

WV Department of **Environmental Protection**



west virginia department of environmental prolection

Dard Ray Contention Covernor Bendy C Huffman, Cabinet Secretary vagovagob

(304) 356-0-926 (805) 059-0-926 (905) 059-0-920 (905) 059-0-920 (905) 059-0-92

SLVLE OF WEST VIRGINIA BEFORE THE OFFICE OF OIL AND GAS

VAD GVZ MELLS RECULATIONS OF CEMENTING OIL THE OPERATIONAL VAD 32 C2R § 8-9.2.h. 4/5/6/8 OF THE RECOUVATION 35 CSR § 4-11'4/11'8/14'1 ORDER NO: 2014 - 17 IN THE MATTER OF A VARIANCE FROM

EINDINGS OF EACT

1.) Nators Completion & Production Services Co. proposes the following cement blend:

PA mithin thympressive strength within 6 hours and a 24.435 psi compressive strength within 24 2.) Laboratory testing results indicate that the blend listed in Pact No.1 will achieve a 500

Promoting a healthy environment.

- 0.25 % Super Flake (Lost Circulation)
- 5.20 % Water 5.20 % Water

- - 2% Calcium Chloride (Accelerator)

Mabora Completion & Production Services Co. requests approval of a different cement blend for use in cementing surface and coal protection easing of oil and gas wells.

REPORT OF THE OFFICE

Environmental Protection WV Department of

VNC I P SOIT

Office of Oil and Gas **BECEINED**

CONCLUSIONS OF LAW

Pursuant to Articles 6 and 6A, Chapter 22 of the Code of West Virginia, the Office of Oil and Gas has jurisdiction over the subject matter embraced in said notice, and the persons interested therein, and jurisdiction to promulgate the hereinafter prescribed Order.

Pursuant to 35 CSR \S 4-11.5 and 35 CSR \S 8-9.2.h.8 the Chief of the Office of Oil and Gas may approve different cement blends upon the well operator providing satisfactory proof that different cement types are adequate.

ORDER

It is ordered that Nabors Completion & Production Services Co. may use the cement blend listed in Findings of Fact No.1 for the cementing of surface and coal protection easing of oil and gas wells in the State as may be requested by oil and gas operators. The waiting time on the cement blend shall be 8 hours. The cement blend shall be mixed in strict accordance with the specifications for each blend and weight measurements made on-site to assure the cement slurries meet the minimum weight specifications. A sample shall be collected and, if after 8 hours the cement is not set up, additional time will be required. Nabors Completion & Production Services Co. shall keep a record of cement blend jobs in which the cement blend approved under this order is to be used and made available to the Office of Oil and Gas upon request.

Dated this, the 18th day of March, 2014.

IN THE NAME OF THE STATE OF WEST VIRGINIA

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

James Martin, Chief Office of Oil and Gas

12/05/2014

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Office of Oil and Gas

AUG 1 6 2014

WV Department of Environmental Protection WW-9 (5/13)

Pa	ge		of	
API No. 47	041			0
Operator's We	II No.	= =		514168

STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION, OFFICE OF OIL AND 949 4 1 0 5 6 9 0

Fluids/Cuttings Disposal & Reclamation Plan

Operator Name	EQT Production	Co.	OP Code	306686	
Watershed (HUC10)	Sand Fork	Qua	drangle	Peterson	
Elevation1	155.8 County_	Lewis	District	Court House	<u> </u>
	nore than 5,000 bbls of wa	ater to complete the	proposed well wo	rk? Yes x	No
Will a pit be used ? Yes:					
	ibe anticipated pit waste:		back water and re		Tener
Will a synthetic lin	ner be used in the pit?	Yes X No	If so,	what ml.?	60
Proposed Dispo	sal Method For Treated P Land Application Underground Injectio Reuse (at API Numb Off Site Disposal	n (UIC Permit I	Number 00°)
<u> </u>	Other (Explain	(Supply form www-s	i ioi disposai ioca	tion))
Will closed loop system b	ne used ? Yes, The close then prepared for transportate	ed loop system will ren tion to an off-site dispo		om the drilling	
	ated for this well? Air, freshated for this well? Air, freshated for this well? Air, freshated for the state of the state		-	op-hole sections of the wellb and Pilot hole sections, wat curve and lateral,	
	rilling medium? MILBA		Control Lima Chlorida	Solta Bata Filtration	Control
	gent, Defoaming, Walnut Shell,				Control,
	air: lubricant, detergent, defoar				
	e, chloride salts, rate filtration co				
x-cide, SOLTEX terra					
Drill cuttings disposal me	ethod? Leave in pit, landfi	II, removed offsite, e	tc	Landfill	
- If left in pit and	olan to solidify what medium will	be used? (Cement, Line	e, sawdust)	n/a	
- Landfill or offsi	te name/permit number? _		See Attached L	ist	
on August 1, 2005, by the Office provisions of the permit are enforced regulation can lead to enforced licertify under penalty of application form and all attachment the information, I believe that the	d and agree to the terms and cone of Oil and Gas of the West Viriorceable by law. Violations of artement action. Iaw that I have personally examinents thereto and that, based or the information is true, accurate, cluding the possibility of fine or in	rginia Department of Env ny term or condition of the nined and am familiar with n my inquiry of those indi- and complete. I am awar	ironmental Protection e general permit and/ h the information subi viduals immediately re	. I understand that the or other applicable la mitted on this officesponsible for obtaining	w Received
Company Official Signatu Company Official (Typed Company Official Title		Victori Permitting Si	ia J. Roark upervisor		
Subscribed and sworn be	I Barbor	day of NOV	rember	, 20 \C	OFFICIAL SEAL (NOTARY PUBLIC TATE OF WEST VIRGINIA

EQT Production Water plan Offsite disposals for Marcellus wells

CWS TRUCKING INC.

P.O. Box 391 Williamstown, WV 26187 740-516-3586 Noble County/Noble Township Permit # 3390

LAD LIQUID ASSETS DISPOSAL INC.

226 Rankin Road
Washington, PA 15301
724-350-2760
724-222-6080
724-229-7034 fax
Ohio County/Wheeling
Permit # USEPA WV 0014

TRI COUNTY WASTE WATER MANAGEMENT, INC.

1487 Toms Run Road Holbrook, PA 15341 724-627-7178 Plant 724-499-5647 Office Greene County/Waynesburg Permit # TC-1009

Waste Management - Meadowfill Landfill

Rt. 2, Box 68 Dawson Drive Bridgeport, WV 26330 304-326-6027 Permit #SWF-1032-98 Approval #100785WV

Waste Management - Northwestern Landfill

512 E. Dry Road Parkersburg, WV 26104 304-428-0602 Permit #SWF-1025 WV-0109400 Approval #100833WV

BROAD STREET ENERGY LLC

37 West Broad Street Suite 1100 Columbus, Ohio 43215 740-516-5381 Washington County/Belpre Twp. Permit # 8462

TRIAD ENERGY

P.O. Box 430 Reno, OH 45773 740-516-6021 Well 740-374-2940 Reno Office Jennifer Nobel County/Jackson Township Permit # 4037

KING EXCAVATING CO.

Advanced Waste Services 101 River Park Drive New Castle, Pa. 16101 Facility Permit# PAR000029132

4704105690

VV VV-9		Ор	perator's Well No.	514168
Proposed Revegetation	on Treatment: Acres Disturbe	ed29.19	Prevegetation ph	H
Lime	3 Tons/acre	or to correct to pH	6.5	
Fertilize type				
Fertilizer Am	ount1/3	lbs/acre (500 lbs minim	um)	
Mulch	2	Tons/acre	100	
		Seed Mixtures		
ļ .	Temporary		Permanent	
Seed Type KY-31	lbs/acre 40	Seed T Orchard G	.) [os/acre 5
Alsike Clover	5	Alsike Clov	/er 5	
	15		ь.	
Annual Rye				
	cation,pit and proposed area of involved 7.5' topographic s			
Plan Approved by:	SIDW	metal		
2.7	seed/mulch all	disturbed a	reas as Sooi	198
cessonable	possible per re	gulation. Upo	rade Ets	as
necessary	possible per re Per wu DEP F.	+5 manual 1		
	*			
Title: 314 Gas	Inspector	Date: _9/z	24/2014	
Field Reviewed?		Yes () No	
			Rec	eived

SEP 29 214



Site Specific Safety Plan

EQT PET 35 Pad

Peterson

Lewis County, WV

514167	_514168	_514169	For Wells: 514170	514171	_514172
Production	16		repared:	June 30, 2014 WV Oil and 0	Gas Inspector
Deremitte	y Upen	<u> CUISO</u>		Title	Received
8/-/3-/ e	7			Date SDu	Office of Oil and Gas WV Dept. of Environmental Prote
				9/24	bow



Birch River Office Phone: (304) 649-8606 Fax: (304) 649-8608

Birch River, WV 26610 237 Birch River Road P.O. Box 438

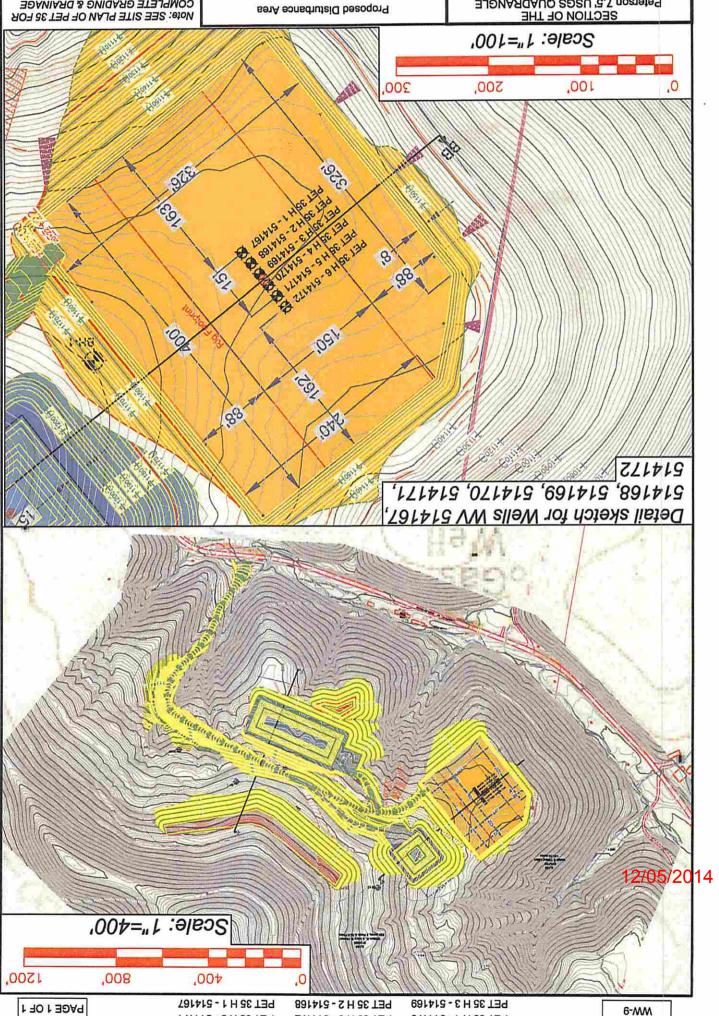
1-800-482-8606 ⊄TTEGHEN∆ 2∩BΛEλ2' INC SURVEYING AND MAPPING SERVICES PERFORMED BY: PATE: July 11, 2014 Dale Tomlin

Rec Plan 371-13 S1-17E FILE NO. Approximate Total Disturbance See Site Plan 24" minimum diameter cuiverts See Site Plan 15" minimum diameter culverts See Site Plan See Site Plan Proposed Access Road See Site Plan Well Site Location SECTION OF THE Peterson 7.5' USGS QUADRANGLE

DETAILS, ETC. EROSION & SEDIMENT CONTROL CONSTRUCTION INCLUDING COMPLETE GRADING & DRAINAGE

DEC 0 & 2014

Office of Oil & Gas D94906H



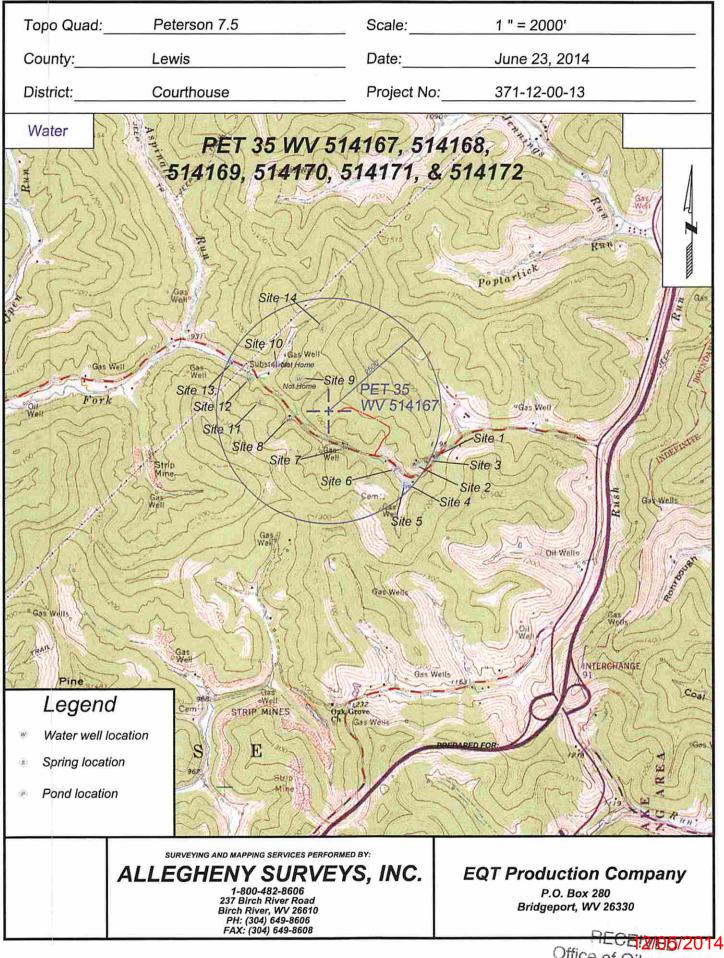
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PET 35 H 5 - 514171

PET 35 H 6 - 514172

PET 35 H 4 - 514170

6-MM



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WV ADECIATION of Environmental Protection WV Department of Environmental Protection

