

DEPARTMENT OF ENVIRONMENTAL PROTECTION
Office of Oil and Gas Management

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TITLE: Guidelines for Development of Operator Pressure Barrier Policy for Unconventional Wells

EFFECTIVE DATE: Upon publication of notice as final in the *Pennsylvania Bulletin*

AUTHORITY: The Oil and Gas Act of 2012 (58 Pa. C.S. § 3201 *et seq.*)
The Clean Streams Law (35 P.S. § 691.1 *et seq.*)
The Solid Waste Management Act (35 P.S. §§ 6018.101 *et seq.*)
25 Pa. Code §§ 78a.54-78a.58 and 78a.60-78a.61, 78a.71, 78a.72, 78a.74, 78a.76, 78a.84, 78a.87.

POLICY: Unconventional well operators conducting drilling, hydraulic fracturing, alteration or plugging activities should follow this policy to develop a method of control and disposal for fluids, solids and residual waste that ensures protection of people and the environment

PURPOSE: The purpose of this guidance is to inform those engaged in drilling, hydraulic fracturing, alteration or plugging activities how to comply with the requirements of The Clean Streams Law, The Solid Waste Management Act, the 2012 Oil and Gas Act, Chapters 78a, and other applicable laws. This policy has been developed to facilitate appropriate well control incident risk mitigation and includes guidance aimed at assisting unconventional operators in the development of the Pressure Barrier Policy component of a Preparedness, Prevention and Contingency (PPC) plan. An unconventional operator's PPC plan shall include, but not be limited to, the control and disposal methods for fluids, solids and residual waste; including tophole water, brines, drilling fluids, drilling muds, stimulation fluids, well servicing fluids, oil, production fluids and drill cuttings; in a manner that prevents pollution of the waters of this Commonwealth.

APPLICABILITY: This Policy applies to unconventional operators conducting drilling, hydraulic fracturing, alteration or plugging activities at unconventional wells in the Commonwealth of Pennsylvania.

DISCLAIMER: The policies and procedures outlined in this guidance document are intended to supplement existing requirements. Nothing in the policies or procedures will affect regulatory requirements.

The policies and procedures herein are not an adjudication or a regulation. There is no intent on the part of the Department to give these rules that weight or deference. This document establishes the framework, within which DEP will exercise its administrative discretion in the future. DEP

reserves the discretion to deviate from this policy statement if circumstances warrant.

PAGE LENGTH: 10 pages

I. BACKGROUND

Pennsylvania Title 25, Chapter 78a, Section 78a.55 Control and disposal planning; emergency response for unconventional wells codifies the Department of Environmental Protection's (Department or DEP) current position regarding the development and maintenance of Preparedness, Prevention and Contingency (PPC) plans for well sites.

This section requires all unconventional operators to develop and implement a site-specific PPC plan for unconventional well operations. This requirement clarifies existing requirements in § 91.34 (relating to activities utilizing pollutants) and § 102.5(l). Additionally, site-specific PPC plans are needed to address local conditions, including local emergency contact information. The PPC plans should be made available to the public and county emergency management agencies, as well as kept on the well site during well site activities such as drilling, completion, or plugging of the well.

There may be instances when the operator finds that a PPC plan prepared for one well site is applicable to another site. Each individual plan shall be analyzed prior to making this determination. It is not the intent of DEP to require that each PPC plan be separately developed and different for each well site. DEP understands that many of the practices covered in the PPC plan are the same for a given operator. Also, DEP does not require that all PPC plans be revised annually. In many cases, if conditions at the site do not change, there will not be a need to make revisions to the PPC plan.

DEP has developed a checklist procedure set forth below that will address the requirements of Pennsylvania Title 25, Chapter 78a, § 78a.55. Control and disposal planning; emergency response for unconventional wells, which requires unconventional well operators to develop a PPC plan which shall include, but not be limited to, the control and disposal methods for fluids, solids and residual waste; including tophole water, brines, drilling fluids, drilling muds, stimulation fluids, well servicing fluids, oil, production fluids and drill cuttings; in a manner that prevents pollution of the waters of this Commonwealth. The PPC plan must also identify the control and disposal methods and practices utilized by the well operator and be consistent with the Oil and Gas Act of 2012, the Clean Streams Law (35 P.S. §§ 691.1-691.1001), the Solid Waste Management Act (35 P.S. §§ 6018.101-6018.1003) and §§ 78a.54-78a.58 and 78a.60-78a.61. Finally, the PPC plan must include a Pressure Barrier Policy developed by the operator that identifies mechanical barriers to be used during relevant operations. Additional requirements set forth in the Regulations can be found in Pennsylvania Title 25, Chapter 78, §§ 78a.71. Use of safety devices – well casing, 78a.72. Use of safety devices – blow-out prevention equipment, 78a.74. Venting of gas, 78a.84. Casing Standards, and, for operations associated with a gas storage reservoir, 78a.76. Drilling within a gas storage reservoir area., and 78a.87. Gas storage reservoir protective casing and cementing procedures.

II. APPLICABILITY

The applicability of this policy, which addresses necessary components of an operator's Pressure Barrier Policy, is determined through reference of the following scenarios where blow-out prevention/preventer (BOP) and/or ancillary equipment is required by regulation:

- (1) When drilling a well that is intended to produce natural gas from an unconventional formation.

- (2) When drilling out solid core hydraulic fracturing plugs to complete a well.
- (3) When well head pressures or natural open flows are anticipated at the well site that may result in a loss of well control.
- (4) When the operator is drilling in an area where there is no prior knowledge of the pressures or natural open flows to be encountered.
- (5) On wells regulated by the Oil and Gas Conservation Law (58 P.S. §§ 401-419).
- (6) When drilling within 200 feet [500 feet without written consent per Act 13, § 3215(a)] of a building.
- (7) When drilling within a gas storage reservoir or within the storage reservoir protected area.

In circumstances when one or more of the conditions above apply, all information contained in this document should be referenced when developing the required pressure barrier component of the PPC plan. Note that if none of these criteria apply at a well, only the Contingency Plan portion of the worksheet need be referenced by the operator to develop the Pressure Barrier Policy. Note also that all worksheet items in the applicable sections of this document associated with specific regulatory citations must be addressed in the Pressure Barrier Policy, although DEP may deem, on a case-by-case basis, that other items are necessary during well site activities to safely drill, complete, or plug a well.

III. CHECKLIST PROCEDURE

The following checklist is meant only to serve as guidance for assembling the plan and does not take the place of a complete PPC plan under a separate title and heading which is prepared for the site and kept at the well site during well site activities. It is recommended that a completed worksheet(s) be included in the PPC plan as a separate appendix to provide clarity for DEP inspectors assessing such plans for compliance with all applicable rules, regulations and laws. A separate worksheet should be completed for each operation requiring BOP use, if the equipment needed is different. The operator should also consider the use of separate worksheets on a hole-section basis, as equipment ratings and functionality may change with respect to well depth.

IV. CHECKLIST QUESTIONS

I. Applicability:

- I.1. Is a BOP required under 78a.72 or 78a.87(a)(2)?
 - I.1a. If no, please proceed to Section IV - Contingency Plan.
 - I.1b. If yes, please proceed to Section II - Equipment.

II. Equipment (for any checklist item specifically referenced in Chapter 78a as a requirement, “Yes” must be checked or an explanation provided in the PPC plan):

- II.1. Are there at least two mechanical pressure barriers as required under § 78a.55(d) and § 78a.72(i)?
 - II.1a. If yes, please **briefly** describe.
- II.2. Will any fluid barriers be used during this operation?
 - II.2a. If yes, please provide a **brief** description of the fluids and how they will be used.
- II.3. Identify all operations during which a BOP must be used under 78a.72 or 78a.87(a)(2).
 - II.3a. Please provide a **brief** description of BOP and ancillary equipment, casing and well head configurations that will be available and may be utilized during drilling, stimulation/completion, work-over and plugging of the well, if required. Please include BOP inspection sheets as part of the description or have them available on-site.
 - II.4a. What is the maximum anticipated pressure (MAP) (psi) for the relevant operations that BOP and ancillary equipment, casing and well head could be subjected to? If the casing must be pressure tested in accordance with § 78a.84(d) or (f), this information is required.
 - II.4b. How was the maximum anticipated pressure determined?
 - II.4c. What is the pressure rating (PR) (psi) of the BOP?
- II.5. For a BOP with a pressure rating greater than 3,000 psi, are controls accessible for actuation and additional controls present, not associated with the hydraulic system of the rig, at a minimum distance of 50 feet, per § 78a.72(c)?
 - II.6a. Will a comprehensive test of the ram type BOP and related equipment be completed for both pressure and ram operation prior to placing it into service per § 78a.72(e)?
 - II.6b. Is there a procedure in place to have the annular type BOP tested per the manufacturer’s specifications or under the direction of a qualified professional engineer per § 78a.72(e)?
- II.7a. Will a Formation Integrity Test (FIT)/Leak Off Test (LOT) been performed? If gas will be produced inside of the intermediate casing, a FIT or LOT is required per § 78a.83c(b).
 - II.7b. If yes, what was the FIT/LOT test pressure (psi)?

- II.7c. If no, how has the competency of the casing seat been determined per § 78a.72(a)?
- II.7d. Based on the competency of the casing seat and MAP, is a hard shut-in permissible?
- II.8. Does the casing, as well as the pipe fittings, valves and unions placed on or connected to the BOP system, have working pressure ratings in excess of the maximum anticipated pressure, per § 78a.72(d)?
- II.9. Is there a procedure in place to visually inspect the equipment during drilling operations per § 78a.72(f)?
- II.10a. Have all ram testing procedures in place been developed in accordance with API RP 53 or approved by DEP, per § 78a.72(f)?
- II.10b. Have the pipe rams been tested daily for closure during drilling operations per § 78a.72(f)?
- II.10c. Have the blind rams been tested at least daily for closure during drilling operations, per § 78a.72(f)?
- II.10d. Are all inspection and closure test results being recorded in the driller's log before the end of the tour, per § 78a.72(f)?
- II.11. Are all lines, valves and fittings between the closing unit and the BOP stack flame resistant and characterized by working pressures that meet or exceed those of the BOP system, per § 78a.72(g)?
- II.12. Does the minimum cemented intermediate casing meet the requirements set forth in § 78a.72(k), or has an alternative method been approved?
- II.13. Have all welded or used casing strings used to anchor BOPs, or any new casing used to anchor BOPs with pressure ratings greater than 3,000 psi been pressure tested after cementing, per § 78a.84(d) or (f)?
- II.14. Is the pressure test compliant with § 78a.84(d) or (f), i.e., no more than 10% decrease in pressure over a 30-minute period, or has an alternative test method been approved by the Department?
- II.15. Has the certification of the pressure test been confirmed by entry and signature of the person performing the test on the driller's log, per § 78a.84(f)?
- II.16. Please provide a **brief** description and schematic of the well head assembly that clearly indicates which string of casing the "A" section of the well head will be attached to upon completion of drilling and construction.

II.17. Are there other completed wells on the pad adjacent to the well that is the subject of the pressure barrier policy?

II.17a. If yes, please **briefly** describe how they have been secured.

III. Training/Certification (for any worksheet item specifically referenced in Chapter 78a as a requirement, “Yes” must be checked or an explanation provided in the PPC plan):

III.1. Is there an International Association of Drilling Contractors (IADC) or other DEP approved organization certified individual present on site during operations requiring a BOP, per § 78a.72(h)?

III.1a. If so, is the certification available for review on site, per § 78a.72(h)?

IV. Contingency Plan (Items 1., 1a., and 2. must be answered in the PPC plan):

IV.1. If excess gas is encountered during drilling, completion or stimulation, can it be flared, captured or diverted in a manner that does not create a hazard to the public health or safety, per § 78a.74?

IV.1a. If yes, document that § 78a.74 will be met by providing a description of the size, construction and length of the flare line and the method used to anchor it. Include a **brief** description of the igniters and indicate if back-up igniters are present.

IV.2. If BOP equipment will not be utilized during drilling, completion, work-over or plugging of the well per the requirements of § 78a.72, please **briefly** explain why or describe what type of pressure barriers are in place along with the details of a contingency plan for managing unanticipated kicks or a loss of well control.

IV.3. Is there an IADC methodology or equivalent methodology in place to kill the well or control a kick, if required?

IV.3a. If yes, please **briefly** explain the methodology to be employed.

IV.4. Is the operator drilling within a gas storage reservoir per § 78a.87?

IV.4a. If yes, has the drilling as well as the casing and cementing plan been approved by the storage operator and the DEP, in accordance with § 78a.76(a)?

IV.4b. If yes, **briefly** summarize the procedure for controlling anticipated gas storage reservoir pressures and flows at all times when drilling from 200 feet above a gas storage reservoir horizon to the depth at which the gas storage protective casing will be installed, per § 78a.87(a)(2).

V. CHECKLIST

Section	Question	Response (Circle Appropriate Response or Provide Requested Information)	Additional Notes or Information: Provide, As Needed:	Regulatory Citation	Page in Operator Pressure Barrier Policy	Have Requirements Been Addressed in Operator's Policy (Y/N)
I.	1.	Y or N		§ 78a.72 or § 78a.87(a)(2)		
II.	1.	Y or N or NA		§ 78a.55(d) and § 78a.72(i)		
II.	1a.	Narrative or NA				
II.	2.	Y or N or NA				
II.	2a.	Narrative or NA				
II.	3.	BOP to be used during: Circle One: Drilling; Stimulation; Work-over; Plugging	May include Hole Section:	§ 78a.72 and § 78a.87(a)(2)		
II.	3a.	Narrative or NA				
II.	4a.	MAP: _____ or NA		§ 78a.84(d) or (f)		
II.	4b.	Narrative or NA				
II.	4c.	PR: _____ or NA				
II.	5.	Y or N or NA		§ 78a.72(c)		
II.	6a.	Y or N or NA		§ 78a.72(e)		
II.	6b.	Y or N or NA		§ 78a.72(e)		
II.	7a.	Y or N or NA		§ 78a.83c.(b)		

Section	Question	Response (Circle Appropriate Response or Provide Requested Information)	Additional Notes or Information: Provide, As Needed:	Regulatory Citation	Page in Operator Pressure Barrier Policy	Have Requirements Been Addressed in Operator's Policy (Y/N)
II.	7b.	LOT/FIT: _____ or NA				
II.	7c.	Narrative or NA		§ 78a.72(a)		
II.	7d.	Y or N or NA				
II.	8.	Y or N or NA		§ 78a.72(d)		
II.	9.	Y or N or NA		§ 78a.72(f)		
II.	10a.	Y or N or NA		§ 78a.72(f)		
II.	10b.	Y or N or NA		§ 78a.72(f)		
II.	10c.	Y or N or NA		§ 78a.72(f)		
II.	10d.	Y or N or NA		§ 78a.72(f)		
II.	11.	Y or N or NA		§ 78a.72(g)		
II.	12.	Y or N or NA		§ 78a.72(k)		
II.	13.	Y or N or NA		§ 78a.84(d) or (f)		
II.	14.	Y or N or Alternate or NA		§ 78a.84(d) or (f)		
II.	15.	Y or N or NA		§ 78a.84(f)		
II.	16.	Narrative or NA				
II.	17.	Y or N or NA				
II.	17a.	Narrative or NA				
III.	1.	Y or N or NA		§ 78a.72(h)		
III.	1a.	Y or N or NA		§ 78a.72(h)		
IV.	1.	Y or N		§ 78a.74		
IV.	1a.	Narrative		§ 78a.74		

Section	Question	Response (Circle Appropriate Response or Provide Requested Information)	Additional Notes or Information: Provide, As Needed:	Regulatory Citation	Page in Operator Pressure Barrier Policy	Have Requirements Been Addressed in Operator's Policy (Y/N)
IV.	2.	Narrative		§ 78a.72		
IV.	3.	Y or N or NA				
IV.	3a.	Narrative or NA				
IV.	4.	Y or N or NA		§ 78a.87		
IV.	4a.	Y or N or NA		§ 78a.76(a)		
IV.	4b.	Narrative or NA		§ 78a.87(a)(2)		

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