ANNEX A

Title 25. Environmental Protection

Part I. Department of Environmental Protection

Subpart C. Protection of Natural Resources

Article I. Land Resources

CHAPTER 78. OIL AND GAS WELLS

Subchapter A. GENERAL PROVISIONS

§ 78.1. Definitions.

(a) The words and terms defined in section 103 of the act (58 P. S. § 601.103), section 2 of the Coal and Gas Resource Coordination Act (58 P. S. § 502), section 2 of the Oil and Gas Conservation Law (58 P. S. § 402), section 103 of the Solid Waste Management Act (35 P. S. § 6018.103) and section 1 of The Clean Stream Law (35 P. S. § 691.1), have the meanings set forth in those statutes when the terms are used in this chapter.

(b) The following words and terms, when used in this chapter, have the following meanings, unless the context clearly indicates otherwise:

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Casing seat—The depth to which [**~~the surface casing or coal protection~~**] casing **[is run] [~~or intermediate casing~~] is set.** [~~In wells without surface casing, the~~ **~~surface~~** ~~casing seat shall be~~ **~~considered to be~~** ~~equal to~~ **~~50 feet below the deepest fresh groundwater~~ ~~[the depth of casing which is normal for wells in the area]~~**.

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Cement—A mixture of materials for bonding or sealing that attains a 7-day maximum permeability of 0.01 millidarcies and a 24-hour compressive strength of at least 500 psi in accordance with applicable **[API]** standards and specifications.

***Cement job log* – a written record that documents the actual procedures and specifications of the cementing operation. [~~The record must include the type of cement with additives, the volume, yield and density in pounds per gallon of the cement and the amount of cement returned to the surface, if any. Cementing procedural information must include a description of the pumping rates in bbls per minute, pressures in psi, time in minutes and sequence of events during the cementing operation.~~]**

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Conductor pipe **– a short string of large-diameter casing used to stabilize the top of the wellbore in shallow unconsolidated formations.**

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Intermediate casing **– a string of casing SET AFTER THE SURFACE CASING AND BEFORE [~~other than~~] production casing, NOT TO INCLUDE COAL PROTECTION CASING, that is used in the wellbore to isolate, stabilize or provide well control. [~~to a greater depth than that provided by the surface casing or coal protection casing.~~]**

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L.E.L.— LOWER EXPLOSIVE LIMIT

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[*Retrievable*—When used in conjunction with surface casing, coal protective casing or production casing, the casing that can be removed after exerting a prudent effort to pull the casing while applying a pulling force at least equal to the casing weight plus 5000 pounds or 120% of the casing weight, whichever is greater.]

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Surface Casing—**[A string of pipe which extends from the surface and that segregates and protects fresh groundwater and stabilizes the hole.][~~ Casing~~] A STRING OR STRINGS OF CASING used to isolate the wellbore from fresh groundwater and to prevent the escape or migration of gas, oil [~~and~~] OR other fluids from the wellbore into fresh groundwater. The surface casing is also commonly referred to as the water string or water casing.**

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UNCONVENTIONAL FORMATIONS – FORMATIONS THAT TYPICALLY PRODUCE GAS THROUGH THE USE OF ENHANCED DRILLING OR COMPLETION TECHNOLOGIES SUCH AS THE RHINESTREET, BURKET, MARCELLUS, MANDATA AND UTICA SHALE FORMATIONS, OR OTHER FORMATIONS IDENTIFIED BY THE DEPARTMENT.

Subchapter C. ENVIRONMENTAL PROTECTION

PERFORMANCE STANDARDS

§ 78.51. Protection of water supplies.

(a) A well operator who affects a public or private water supply by pollution or diminution shall restore or replace the affected supply with an alternate source of water adequate in quantity and quality for the purposes served by the supply **as determined by the Department**.

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(d) **[The operator shall affirmatively demonstrate to the Department's satisfaction that the quality of the restored or replaced water supply to be used for human consumption is at least equal to the quality of the water supply before it was affected by the operator. If the quality of the water supply before it was affected by the operator cannot be affirmatively established, the operator shall demonstrate that the concentrations of substances in the restored or replaced water supply do not exceed the primary and secondary maximum contaminant levels established under § 109.202 (relating to State MCLs and treatment technique requirements).] A restored or replaced water supply shall include any well, spring, public water system or other WATER supply approved by the Department, which meets the criteria for adequacy as follows:**

(1) *Reliability, cost, maintenance and control.* A restored or replaced water supply, at a minimum, must:

(i) Be as reliable as the previous water supply.

(ii) Be as permanent as the previous water supply.

(iii) Not require excessive maintenance.

(iv) Provide the [~~owner and the~~] WATER user with as much control and accessibility as exercised over the previous water supply.

(v) Not result in increased costs to operate and maintain. If the operating and maintenance costs of the restored or replaced water supply are increased, the operator shall provide for permanent payment of the increased operating and maintenance costs of the restored or replaced water supply.

(2) *Quality.* The quality of a restored or replaced water supply will be deemed adequate if it meets the standards established pursuant to the Pennsylvania Safe Drinking Water Act (35 P. S. § § 721.1—721.17), or is comparable to the [~~unaffected~~] THE QUALITY OF THE water supply BEFORE IT WAS AFFECTED BY THE OPERATOR if that water supply did not meet these standards.

(3) A*dequate quantity.* A restored or replaced water supply will be deemed adequate in quantity if it meets one of the following as determined by the Department:

(i) It delivers the amount of water necessary to satisfy the water user's needs and the demands of any reasonably foreseeable uses.

(ii) It is established through a connection to a public water supply system [~~which~~] THAT is capable of delivering the amount of water necessary to satisfy the water user's needs and the demands of any reasonably foreseeable uses.

(iii) For purposes of this paragraph and with respect to agricultural water supplies, the term reasonably foreseeable uses includes the reasonable expansion of use where the water supply available prior to drilling exceeded the actual use.

(4) *Water source serviceability.* Replacement of a water supply includes providing plumbing, conveyance, pumping or auxiliary equipment and facilities necessary for the [~~surface landowner or water purveyor~~] WATER USER to utilize the water supply.

(e) If the water supply is for uses other than human consumption, the operator shall demonstrate to the Department's satisfaction that the restored or replaced water supply is adequate for the purposes served by the supply.

(f) **[The oil or gas well operator's duty to replace or restore a water supply includes providing plumbing, conveyance, pumping or auxiliary equipment and facilities necessary for the surface landowner or water purveyor to utilize the water supply.]**

[(g)] Tank trucks or bottled water are acceptable only as temporary water replacement for a period approved by the Department and do not relieve the operator of the obligation to provide a restored or replaced water supply.

[(h)] (g) If the well operator and the [**~~landowner, water purveyor or affected person~~**] **WATER USER** are unable to reach agreement on the means for restoring or replacing the water supply, the Department or either party may request a conference under section 501 of the act (58 P. S. § 601.501).

(h) A well operator who receives notice from a landowner, water purveyor or affected person that a water supply has been affected by pollution or diminution, shall report receipt of [~~such~~] notice FROM AN AFFECTED PERSON to the Department within [~~10 calendar days~~] 24 HOURS of receiving the notice.

§ 78.52**.** Predrilling or prealteration survey**.**

(a) A well operator who wishes to preserve its defense under section 208(d)(1) of the act (58 P. S. § 601.208(d)(1)) that the pollution of a water supply existed prior to the drilling or alteration of the well shall **[cause]** **conduct** a predrilling or prealteration survey **[to be conducted]** in accordance with this section.

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(d) An operator electing to preserve its defenses under section 208(d)(1) of the act shall provide a copy of the results of the survey to the Department and the landowner or water purveyor within 10-[~~calendar~~] **BUSINESS** days of **receipt** **[being notified by the Department to submit a copy]** of the results. **TEST RESULTS NOT RECEIVED BY THE DEPARTMENT WITHIN 10 BUSINESS DAYS MAY NOT BE USED TO PRESERVE THE OPERATOR'S DEFENSES UNDER SECTION 208(D)(1) OF THE ACT.**

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§ 78.55. Control and disposal plan.

(a) Prior to generation of waste, the well operator shall prepare and implement a plan under § 91.34 (relating to activities utilizing pollutants) for the control and disposal of fluids, residual waste and drill cuttings, including tophole water, brines, drilling fluids, additives, drilling muds, stimulation fluids, well servicing fluids, oil, production fluids and drill cuttings from the drilling, alteration, production, plugging or other activity associated with oil and gas wells.

(b) The plan shall identify the control and disposal methods and practices utilized by the well operator and be consistent with the act, The Clean Streams Law (35 P. S. § § 691.1—691.1001), the Solid Waste Management Act (35 P. S. § § 6018.101—6018.1003) and § § 78.54, 78.56—78.58 and 78.60—78.63. **THE PLAN SHALL ALSO INCLUDE A PRESSURE BARRIER POLICY THAT IDENTIFIES BARRIERS TO BE USED DURING IDENTIFIED OPERATIONS.**

(c) The operator shall revise the plan prior to implementing a change to the practices identified in the plan.

(d) A copy of the plan shall be provided to the Department upon request **AND SHALL BE AVAILABLE AT THE WELL SITE DURING DRILLING AND COMPLETION ACTIVITIES FOR REVIEW**.

(E) A LIST OF EMERGENCY CONTACT PHONE NUMBERS FOR THE AREA IN WHICH THE WELL SITE IS LOCATED MUST BE INCLUDED IN THE PLAN AND BE PROMINENTLY DISPLAYED AT THE WELL SITE DURING DRILLING, COMPLETION OR ALTERATION ACTIVITIES.

Subchapter D. WELL DRILLING, OPERATION AND PLUGGING

GENERAL

Sec.

CASING AND CEMENTING

OPERATING WELLS

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Subchapter D. WELL DRILLING, OPERATION AND PLUGGING

GENERAL

§ 78.71. Use of safety devices—well casing.

(a) The operator shall equip the well with one or more strings of casing of sufficient **cemented** length and strength to **attach [~~blow-out prevention~~] PROPER WELL CONTROL equipment and** prevent blowouts, explosions, fires and casing failures during installation, completion and operation.

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§ 78.72. Use of safety devices—blow-out prevention equipment.

(a) The operator shall use blow-out prevention equipment **AFTER SETTING CASING WITH A COMPETENT CASING SEAT[when well head pressures or natural open flows are anticipated at the well site that may result in a blow-out or when the operator is drilling in an area where there is no prior knowledge of the pressures or natural open flows to be encountered.] in the following circumstances:**

(1) When drilling a well that is intended to produce natural gas from [the Marcellus Shale] AN UNCONVENTIONAL formation;

(2) WHEN DRILLING OUT SOLID CORE HYDRAULIC FRACTURING PLUGS TO COMPLETE A WELL;

(2) When well head pressures or natural open flows are anticipated at the well site that may result in a loss of well control;

(3) When the operator is drilling in an area where there is no prior knowledge of the pressures or natural open flows to be encountered;

(4) On wells regulated by the Oil and Gas Conservation Law (58 P.S. §§ 401 – [~~409~~] 419);

(5) When drilling within 200 feet of a building.

(b) Blow-out prevention equipment used shall be in good working condition at all times.

(c) Controls for the blow-out preventer shall be accessible to allow actuation of the equipment. Additional controls for a blow-out preventer with a pressure rating of

greater than 3,000 psi, not associated with the rig hydraulic system, shall be located AT LEAST 50 FEET away from the drilling rig such that the blow-out preventer can be actuated if control of the well is lost.

[(c)] (d) * * * * *

[(d)] (e) The operator shall conduct a complete test of the ram type blow-out preventer and related equipment for both pressure and ram operation before placing it in service on the well. The operator shall test the annular type blow-out preventer in accordance with the manufacturer's published instructions, or the instructions of a professional engineer, prior to the device being placed in service. **Blow-out prevention equipment that fails the test shall not be used until it is repaired and passes the test.**

[(e)] (f) When the equipment is in service, the operator shall visually inspect blow-out prevention equipment during each tour of drilling operation and during actual drilling operations test the pipe rams for closure daily and the blind rams for closure on each round trip. When more than one round trip is made in a day, one daily closure test for blind rams is sufficient. Testing shall be conducted in accordance with American Petroleum Institute publication API RP53, ''API Recommended Practice for Blowout Prevention Equipment Systems for Drilling Wells.''**, OR OTHER PROCEDURE APPROVED BY THE DEPARTMENT**. The operator shall record the results of the inspection and closure test in the drillers log before the end of the tour. **IF blow-out prevention equipment [~~that~~] is not in good working order, DRILLING SHALL CEASE WHEN CESSATION OF DRILLING CAN BE ACCOMPLISHED SAFELY AND NOT RESUME UNTIL THE BLOW-OUT PREVENTION EQUIPMENT IS [~~shall be~~] repaired or replaced [~~immediately~~] and re-tested. [~~prior to the resumption of drilling.~~]**

(g) All lines, valves and fittings between the closing unit and the blow-out preventer stack shall be flame resistant and have a rated working pressure that meets or exceeds the requirements of the blow-out preventer system.

[(f)] (h) [~~**During drilling when conditions are such that the use of a blowout preventer can be anticipated**~~] **WHEN A BLOWOUT PREVENTER IS INSTALLED OR REQUIRED PURSUANT TO SUBSECTION (A)**, there shall be present on the **[rig floor a certified] well site an** individual **[responsible to] [~~who the operator has determined is trained and competent in the use of the blow-out prevention equipment.~~** ~~Satisfactory completion of~~ **[a United States Geologic Survey (U.S.G.S.)]** ~~a~~**[n approved] WITH A CURRENT CERTIFICATION FROM A** well control course **ACCREDITED by the [American Petroleum Institute,]** [~~**Independent**~~**] INTERNATIONAL Association of Drilling Contractors OR OTHER ORGANIZATION APPROVED BY THE DEPARTMENT. THE CERTIFICATION SHALL BE AVAILABLE FOR REVIEW AT THE WELL SITE. THE DEPARTMENT SHALL MAINTAIN A LIST OF APPROVED**

ACCREDITING ORGANIZATIONS ON ITS WEBSITE. **[**~~or equivalent study shall be deemed adequate **[certification]** for purposes of this subsection.~~]

(I) WELL DRILLING AND COMPLETION OPERATIONS REQUIRING PRESSURE BARRIERS, AS IDENTIFIED BY THE OPERATOR PURSUANT TO 25 PA. CODE § 78. 55(B), SHALL EMPLOY AT LEAST TWO MECHANICAL PRESSURE BARRIERS BETWEEN THE OPEN PRODUCING FORMATION AND THE ATMOSPHERE THAT ARE CAPABLE OF BEING TESTED. THE MECHANICAL PRESSURE BARRIERS SHALL BE TESTED ACCORDING TO MANUFACTURER SPECIFICATIONS PRIOR TO OPERATION. IF DURING THE COURSE OF OPERATIONS THE OPERATOR ONLY HAS ONE FUNCTIONING BARRIER, OPERATIONS MUST CEASE UNTIL ADDITIONAL BARRIERS ARE ADDED AND TESTED OR THE REDUNDANT BARRIER IS REPAIRED AND TESTED. STRIPPER RUBBER OR A STRIPPER HEAD SHALL NOT BE CONSIDERED A BARRIER.

(J) A COILED TUBING RIG OR A HYDRAULIC WORKOVER UNIT WITH APPROPRIATE BLOWOUT PREVENTION EQUIPMENT MUST BE EMPLOYED DURING POST COMPLETION CLEANOUT OPERATIONS IN HORIZONTAL UNCONVENTIONAL FORMATIONS.

[(g)] (k) The minimum amount of **INTERMEDIATE** [~~cemented~~] casing **THAT IS CEMENTED TO THE SURFACE** to which blow-out prevention equipment may be attached, shall be in accordance with the following:

*Proposed Total **VERTICAL** Depth (in feet)*	*Minimum Cemented Casing Required (in feet of casing cemented)*
Up to 5,000	400
5,001 to 5,500	500
5,501 to 6,000	600
6,001 to 6,500	700
6,501 to 7,000	800
7,001 to 8,000	1,000
8,001 to 9,000	1,200
9,001 to 10,000	1,400
Deeper than 10,000	1,800

[(h)] (l) * * * * *

§ 78.73. General provision for well construction and operation.

(a) The operator shall construct and operate the well in accordance with this chapter and ensure that the integrity of the well is maintained and health, safety, environment and property are protected.

[(a)] (b) The operator shall prevent gas **[and other fluids from lower formations from entering fresh groundwater.], oil, brine, completion and servicing fluids, and any other fluids OR MATERIALS from below the casing seat from entering fresh groundwater, and SHALL OTHERWISE prevent pollution or diminution of fresh groundwater.**

[(b)] (c) After a well has been completed, recompleted, reconditioned or altered the operator shall prevent **SURFACE** shut-in pressure **[or] and SURFACE** producing back pressure [at] **INSIDE** the surface casing [**seat,**]**[or]** coal protective casing [**seat or intermediate casing seat when the intermediate casing is used in conjunction with the surface casing to isolate fresh groundwater]** from exceeding **THE FOLLOWING PRESSURE: 80 percent (80%) [**of the hydrostatic pressure of the surrounding fresh groundwater system in accordance with the following formula. The maximum allowable shut-in pressure [or] and producing back pressure to be exerted at the [surface casing seat, or coal protective] casing seat may not exceed the [hydrostatic] pressure calculated as follows: Maximum pressure = (0.8 x 0.433 psi/foot) multiplied by (casing length in feet).] **MULTIPLIED BY 0.433 PSI PER FOOT MULTIPLIED BY THE CASING LENGTH (IN FEET) OF THE APPLICABLE CASING.**

[**(c)] (d)** After a well has been completed, recompleted, reconditioned or altered, if the **SURFACE** shut-in pressure or **SURFACE** producing back pressure exceeds the **[hydrostatic]** pressure [**at the surface casing seat, coal protective casing**] as calculated in subsection **[(b)] (c)**, the operator shall take action to prevent the migration of gas and other fluids from lower formations into fresh groundwater. To meet this standard the operator may cement or install on a packer sufficient intermediate or production casing or take other actions approved by the Department. This section does not apply during testing for mechanical integrity in accordance with State or Federal requirements.

(e) Excess gas encountered during drilling, completion or stimulation shall be flared, captured or diverted away from the drilling rig in a manner that does not create a hazard to the public health or safety.

(f) Except for gas storage wells, the well must be equipped with a check valve to prevent backflow from the pipelines into the well.

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§ 78.75a. Area of alternative methods.

(a) The Department may designate an area of alternative methods if the Department determines that well drilling requirements beyond those provided in this chapter

are necessary to drill, operate or plug a well in a safe and environmentally protective manner.

(b) To establish an area of alternative methods, the Department shall publish a notice in the *Pennsylvania Bulletin* of the proposed area of alternative methods and provide the public with an opportunity to comment on the proposal. After reviewing any comments received on the proposal, the Department shall publish a final designation of the area and required alternative methods in the P*ennsylvania Bulletin.*

(c) Wells drilled within an area of alternative methods established pursuant to subsection (b) must meet the requirements specified by the Department unless the operator obtains approval from the Department to drill, operate or plug the well in a different manner that is at least as safe and protective of the environment as the requirements of the area of alternative methods.

§ 78.76. Drilling within a gas storage reservoir area.

(a) An operator proposing to drill a well within a gas storage reservoir area or a reservoir protective area to produce gas or oil shall forward by certified mail a copy of the well location plat, the drilling, casing and cementing plan and the anticipated date drilling will commence to the gas storage reservoir operator **and to the Department for approval by the Department** and shall submit proof of notification **TO THE GAS STORAGE RESERVOIR OPERATOR** to the Department with the well permit application.

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CASING AND CEMENTING

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[(c) Casing and cementing standards in § § 78.83—78.85 (relating to surface and coal protective casing and cementing procedures; casing standards; and cement standards) apply to surface casing and coal protective casing but do not apply to production casing.]

§ 78.82 Use of conductor pipe**.**

If the operator installs conductor pipe in the well, the **[operator may not remove the pipe] following provisions shall apply:**

(i) The operator may not remove the pipe;

(ii) Conductor pipe shall be installed in a manner that prevents THE SUBSURFACE infiltration of surface water or fluids [~~from the operation into~~] [~~groundwater~~] BY EITHER DRIVING THE PIPE

INTO PLACE OR CEMENTING THE PIPE FROM THE SEAT TO THE SURFACE;

(iii) Conductor pipe must be made of steel unless a different material is approved for use by the Department.

§ 78.83. Surface and coal protective casing and cementing procedures.

(a) For wells drilled, altered, reconditioned or recompleted after [effective date], surface casing or any casing functioning as a water protection casing must not be utilized as production casing unless one of the following applies:

(1) In oil wells where the operator does not produce any gas generated by the well and the annulus between the surface casing and the production pipe is left open;

(2) The operator demonstrates that the pressure in the well [~~bore at the casing seat~~] is no greater than the pressure permitted by § 78.73(c), [~~and~~] demonstrates through a pressure test or other method approved by the Department that all gas and fluids will be contained within the well, AND INSTALLS A WORKING PRESSURE GAUGE THAT CAN BE INSPECTED BY THE DEPARTMENT.

[(a)] (b) If the well is to be equipped with threaded and coupled casing, the operator shall drill a hole so that the diameter is at least 1 inch greater than the outside diameter of the casing collar to be installed. If the well is to be equipped with plain-end welded casing, the operator shall drill a hole so that the diameter is at least 1 inch greater than the outside diameter of the **[casing tube]** [**~~centralizer band~~] CASING COUPLING**.

[(b)] (c) [Except as provided in subsection (c)*,* t]The operator shall drill to approximately 50 feet below the deepest fresh groundwater or at least 50 feet into consolidated rock, whichever is deeper, and immediately set and permanently cement a string of surface casing to that depth. **EXCEPT AS PROVIDED IN SUBSECTION (F), THE SURFACE CASING SHALL NOT BE SET MORE THAN 200 FEET BELOW THE DEEPEST FRESH GROUNDWATER EXCEPT IF NECESSARY TO SET THE CASING IN CONSOLIDATED ROCK. The surface hole shall be drilled using air, freshwater, or freshwater-based drilling fluid. PRIOR TO CEMENTING, THE WELLBORE SHALL BE CONDITIONED TO ENSURE AN ADEQUATE CEMENT BOND BETWEEN THE CASING AND THE FORMATION. The surface casing seat shall be set in consolidated rock. When drilling a new well or redrilling an existing well, the operator shall install at least one centralizer within 50 feet of the casing seat and then install a centralizer in intervals no greater than every 150 feet above the first centralizer.**

[(c) If no fresh groundwater is being utilized as a source of drinking water within a 1,000-foot radius of the well, the operator may set and permanently cement a single string of surface casing through all water zones, including fresh, brackish and salt

water zones. Prior to penetrating zones known to contain, or likely containing, oil or gas, the operator shall install and permanently cement the string of casing in a manner that segregates the various waters.]

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(f) If additional fresh groundwater is encountered in drilling below the permanently cemented surface casing, the operator shall **DOCUMENT THE DEPTH OF THE FRESH GROUND WATER ZONE IN THE WELL RECORD AND** protect the additional fresh groundwater by installing and cementing a subsequent string of casing or other procedures approved by the Department to completely isolate and protect fresh groundwater. The string of casing may also penetrate zones bearing salty or brackish water with cement in the annular space being used to segregate the various zones. Sufficient cement shall be used to cement the casing ~~**[at least 20 feet into the permanently cemented surface casing**~~**] TO THE SURFACE**. **THE OPERATOR SHALL INSTALL AT LEAST ONE CENTRALIZER WITHIN 50 FEET OF THE CASING SEAT AND THEN INSTALL A CENTRALIZER IN INTERVALS NO GREATER THAN, IF POSSIBLE, EVERY 150 FEET ABOVE THE FIRST CENTRALIZER.**

(g) The operator shall set and cement a coal protective string of casing through workable coal seams. The base of the coal protective casing shall be at least 30 feet below the lowest workable coal seam. **The operator shall install at least two centralizers. One centralizer shall be within 50 feet of the casing seat and the second centralizer shall be within 100 feet of the surface.**

(h) **Unless an alternative method has been approved by the Department in accordance with § 78.75 (relating to Alternative methods), [W]w**hen a well is drilled through a coal seam at a location where the coal has been removed **or when a well is drilled through a coal pillar**, the operator shall drill to a depth of at least 30 feet but no more than 50 feet deeper than the bottom of the coal seam. The operator shall set and cement a coal protection string of casing to this depth. The operator shall equip the casing with a cement basket or other similar device above and as close to the top of the coal seam as practical. The bottom of the casing shall be equipped with an appropriate device designed to prevent deformation of the bottom of the casing. The interval from the bottom of the casing to the bottom of the coal seam shall be filled with cement either by the balance method or by the displacement method. Cement shall be placed on top of the basket between the wall of the hole and the outside of the casing by pumping from the surface. If the operator penetrates more than one coal seam from which the coal has been removed, the operator shall protect each seam with a separate string of casing that is set and cemented or with a single string of casing which is stage cemented so that each coal seam is protected as described in this subsection. The operator shall cement the well to isolate workable coal seams from each other.

(i) If the operator sets and cements casing under subsection (g) or (h) and subsequently encounters additional fresh groundwater zones below the deepest cemented casing string

installed, the operator shall protect the fresh groundwater by installing and cementing another string of casing or other method approved by the Department. Sufficient cement shall be used to cement the casing **[~~at least 20 feet into the surface or coal protective casing~~] TO THE SURFACE**. The additional casing string may also penetrate zones bearing brackish or salt water, but shall be run and cemented prior to penetrating a zone known to or likely to contain oil or gas**. THE OPERATOR SHALL INSTALL AT LEAST ONE CENTRALIZER WITHIN 50 FEET OF THE CASING SEAT AND THEN, IF POSSIBLE, INSTALL A CENTRALIZER IN INTERVALS NO GREATER THAN EVERY 150 FEET ABOVE THE FIRST CENTRALIZER.**

(j) If it is anticipated that cement used to permanently cement the surface casing can not be circulated to the surface a cement basket may be installed immediately above the depth of the **anticipated [last] lost** circulation zone. The casing shall be permanently cemented by the displacement method. Additional cement may be added above the cement basket, if necessary, by pumping through a pour string from the surface to fill the annular space. **FILLING THE ANNULAR SPACE BY THIS METHOD DOES NOT CONSTITUTE PERMANENTLY CEMENTING THE SURFACE OR COAL PROTECTIVE CASING PURSUANT TO 25 PA. CODE § 78.83B.**

§ 78.83a. Casing and cementing plan.

(a) The operator shall prepare and maintain a casing and cementing plan showing how the well will be drilled and completed. The plan must demonstrate compliance with this subchapter and include the following information:

(1) The anticipated depth and thickness of any producing formation, expected pressures, [~~and~~] anticipated fresh groundwater zones AND THE METHOD OR INFORMATION BY WHICH THE DEPTH OF THE DEEPEST FRESH GROUNDWATER WAS DETERMINED;

(2) Diameter of the [~~well bore~~] BOREHOLE;

(3) Casing type, whether the casing is new or used, depth, diameter, wall thickness and burst pressure rating;

(4) Cement type, yield, additives, and estimated amount;

(5) Estimated location of centralizers;

(6) PROPOSED BOREHOLE CONDITIONING PROCEDURES.

[~~(6)~~](7) Alternative methods or materials as required by the Department as a condition of the well permit.

(b) The plan must be available at the well site for review by the Department.

(c) Upon request, the operator shall provide a copy of the well-specific casing and cementing plan to the Department for review and approval.

(d) Any revisions to the plan made as a result of on-site modification shall be documented in the plan [~~by the operator~~] and be available for review by the Department. THE PERSON MAKING THE REVISIONS TO THE PLAN SHALL INITIAL AND DATE THE REVISIONS.

§ 78.83b. Casing and cementing – lost circulation.

(a) If cement used to permanently cement the surface or coal protective casing is not circulated to the surface despite pumping a volume of cement equal to or greater than 120% of the calculated annular space, the operator shall DETERMINE THE TOP OF THE CEMENT, notify the Department, and meet one of the following requirements AS APPROVED BY THE DEPARTMENT:

(1) Run an additional string of casing at least 50 feet deeper than the STRING WHERE CIRCULATION WAS LOST [~~surface casing~~] and cement the [~~second~~] ADDITIONAL string of casing back to the seat of the [~~surface or coal protective casing~~] STRING WHERE CIRCULATION WAS LOST and vent the annulus of the additional casing string to the atmosphere at all times unless closed for well testing or maintenance. Shut-in pressure on the casing seat of the [~~second~~] ADDITIONAL string of casing must not exceed the requirements of section 78.73(c).

(2) [~~If the additional string of casing is the~~] RUN production casing[~~, the operator shall~~] AND set the production casing on a packer in a competent formation below the [~~surface casing seat,~~] STRING WHERE CIRCULATION WAS LOST and vent the annulus of the production casing to the atmosphere at all times unless closed for well testing or maintenance.

(3) Run production casing at least to the top of the formation that is being produced and cement the production casing to the surface.

(4) RUN INTERMEDIATE AND PRODUCTION CASING AND CEMENT BOTH STRINGS OF CASING TO THE SURFACE.

[~~(4)~~] (5) Produce oil but not gas and leave the annulus between the surface casing and the production pipe open.

(B) IN ADDITION TO MEETING THE REQUIREMENTS OF SUBSECTION (A), THE OPERATOR MAY ALSO PUMP ADDITIONAL CEMENT THROUGH A POUR STRING FROM THE SURFACE TO FILL THE ANNULAR SPACE.

~~[(b) If cement used to permanently cement the surface or coal protective casing is not circulated to the surface, the Department may require the operator to determine the amount of casing that was cemented by logging or other suitable method.]~~

§ 78.83c. Intermediate and production casing.

~~[(a) Except as provided in § 78.72 (relating to Use of safety devices – blow-out prevention equipment), intermediate and production casing must be cemented according to this section.]~~

(A) PRIOR TO CEMENTING THE INTERMEDIATE AND PRODUCTION CASING, THE BOREHOLE, MUD AND CEMENT SHALL BE CONDITIONED TO ENSURE AN ADEQUATE CEMENT BOND BETWEEN THE CASING AND THE FORMATION.

[(b)] If the well is to be equipped with an intermediate casing, CENTRALIZERS SHALL BE USED AND the casing must be cemented TO THE SURFACE BY THE DISPLACEMENT METHOD. [~~from the casing seat to a point at least 500 feet above the seat. If any producing horizon is open to the wellbore above the casing seat, the casing must be cemented from the casing seat up to a point at least 500 feet above the top of the shallowest productive horizon, or to a point at least 200 feet above the shoe of the next shallower casing string that was set and cemented in the well.~~] GAS MAY BE PRODUCED OFF [~~The~~] THE intermediate casing [~~may be perforated to produce gas or oil~~ if a shoe test demonstrates THAT ALL GAS WILL BE CONTAINED WITHIN THE WELL [~~a pressure gradient greater than 0.465 psi/ft multiplied by casing length in feet~~] AND A RELIEF VALVE IS INSTALLED AT THE SURFACE THAT IS SET LESS THAN THE SHOE TEST PRESSURE. THE SHOE TEST PRESSURE SHALL BE RECORDED IN THE COMPLETION REPORT.

[(c)] Except as provided for in § 78.83 (relating to surface and coal protective casing and cementing procedures), each well must be equipped with production casing. The production string may be set on a packer or cemented in place. If the production casing is cemented in place, CENTRALIZERS SHALL BE USED AND cement must be placed by the displacement method with sufficient cement to fill the annular space [~~to the surface or~~] to a point at least 500 feet above [~~the production casing seat~~] TRUE VERTICAL DEPTH OR AT LEAST 200 FEET ABOVE THE UPPERMOST PERFORATIONS, WHICHEVER IS GREATER.

§ 78.84. Casing standards.

(a) The operator shall install casing that can withstand the effects of tension, and prevent **leaks,** burst and collapse during its installation, cementing and subsequent drilling and producing operations.

(b) [~~Surface~~] EXCEPT AS PROVIDED IN SUBSECTION (C), ALL casing must be a string of new pipe with [~~a~~] AN INTERNAL pressure rating that is at least 20 percent greater than the anticipated maximum pressure to which the [~~surface~~] casing will be exposed.

(c) Used casing may be approved for use as surface, intermediate or production casing but must be pressure tested after cementing and before continuation of drilling. A passing pressure test is holding the anticipated maximum pressure to which it will be exposed for 30 minutes with not more than a 10 percent decrease in pressure.

(d) New or used plain end casing, except when being used as [~~drive pipe,~~] conductor PIPE, [~~or as a casing string prior to setting and cementing surface casing,~~] that is welded together for use must meet the following requirements:

(1) It must pass a pressure test by holding the anticipated maximum pressure to which the casing will be exposed for 30 minutes with not more than a 10 percent decrease in pressure. The operator shall notify the Department at least 24 hours before conducting the test. The test results shall be entered on the drilling log.

(2) It shall be welded using at least three passes with the joint cleaned between each pass.

(3) It shall be welded by a person trained and certified in the applicable American Petroleum Institute[’s], AMERICAN SOCIETY OF MECHANICAL ENGINEERS, AMERICAN WELDING SOCIETY OR EQUIVALENT standard for welding casing and pipe or an equivalent training and certification program as approved by the Department. THE CERTIFICATION REQUIREMENTS OF THIS PARAGRAPH SHALL TAKE EFFECT [INSERT DATE – 6 MONTHS AFTER THE EFFECTIVE DATE]. A person with 10 or more years of experience welding casing as of [effective date] who registers with the Department within nine months of the effective date of this subsection is deemed to be certified.

[(b) The operator shall equip the casing string with appropriate equipment to center the casing through the hole in fresh groundwater zones. This equipment is

not required when existing hole conditions such as caving or crookedness might cause loss of the well or result in a defective cement job.]

[(c)] (e) When casing through a workable coal seam, the operator shall install coal protective casing that has a minimum wall thickness of 0.23 inches.

(f) Casing which is attached to a blow-out preventer with a pressure rating of greater than 3,000 psi shall be pressure tested AFTER CEMENTING. A passing pressure test must be holding [~~120 percent of the highest expected working pressure of the casing string being tested,~~] THE ANTICIPATED MAXIMUM PRESSURE TO WHICH THE CASING WILL BE EXPOSED for 30 minutes with not more than a 10 percent decrease. Certification of the pressure test shall be confirmed by entry and signature of the person performing the test on the driller's log.

§ 78.85. Cement standards.

(a) **When cementing surface casing[~~,~~] OR coal protective casing [~~and intermediate casing when the intermediate casing is used in conjunction with the surface casing to isolate fresh groundwater~~].** [T]**t**he operator shall use cement that **[will resist degradation by chemical and physical conditions in the well.] meets or exceeds the ASTM International C 150, Type I, II or III Standard or API Specification 10. The cement must also:**

(1) Secure the casing in the wellbore;

(2) Isolate the wellbore from fresh groundwater;

(3) Contain any pressure from drilling, completion and production;

(4) [~~Protect the casing from corrosion;~~

~~(5) Resist degradation by the chemical and physical conditions in the well;~~]

PROTECT THE CASING FROM CORROSION FROM, AND DEGRADATION BY, THE GEOCHEMICAL, LITHOLOGIC AND PHYSICAL CONDITIONS OF THE SURROUNDING WELLBORE. FOR WELLS EMPLOYING COAL PROTECTIVE CASING, THIS INCLUDES, BUT IS NOT LIMITED TO, FORMULATING CEMENT TO WITHSTAND ELEVATED SULFATE CONCENTRATIONS AND OTHER GEOCHEMICAL CONSTITUENTS OF COAL AND ASSOCIATED STRATA WHICH HAVE THE POTENTIAL TO ADVERSELY AFFECT THE INTEGRITY OF THE CEMENT.

[~~(6)~~] (5) Prevent gas flow in the annulus. IN AREAS OF KNOWN SHALLOW GAS PRODUCING ZONES, GAS BLOCK ADDITIVES AND LOW FLUID LOSS SLURRIES SHALL BE USED.

(b) **[The operator shall permit the cement to set to a minimum compressive strength of 350 pounds per square inch (psi) in accordance with the American Petroleum Institute's API Specification 10. The operator shall permit the cement to set for a minimum period of 8 hours prior to the resumption of actual drilling.]** **After the casing cement is placed behind surface casing [~~and intermediate casing when the intermediate casing is used in conjunction with the surface casing to isolate fresh groundwater~~], the operator shall permit the cement to set to a minimum designed compressive strength of 350 pounds per square inch (psi) at the casing seat. THE CEMENT PLACED AT THE BOTTOM 300 FEET OF THE SURFACE CASING SHALL CONSTITUTE A ZONE OF CRITCAL CEMENT AND SHALL ACHIEVE A 72 HOUR COMPRESSIVE STRENGTH OF 1,200 PSI AND THE FREE WATER SEPARATION SHALL BE NO MORE THAN SIX MILLILITERS PER 250 MILLILITERS OF CEMENT. IF THE SURFACE CASING IS LESS THAN 300 FEET, THE ENTIRE CEMENTED STRING SHALL CONSTITUTE A ZONE OF CRITICAL CEMENT.**

(c) After [~~the~~] ANY casing cement is placed and cementing operations are complete, the casing may not be disturbed for a minimum of eight (8) hours by:

(1) Releasing pressure on the cement head WITHIN FOUR HOURS OF CEMENTING if [~~float~~] CASING equipment check valves did not hold or [~~float~~] CASING equipment was not equipped with check valves. AFTER FOUR HOURS, THE PRESSURE MAY BE RELEASED AT A CONTINUOUS, GRADUAL RATE OVER THE NEXT FOUR HOURS PROVIDED THE FLOATS ARE SECURE;

(2) Nippling up on or in conjunction to the casing;

(3) Slacking off by the rig supporting the casing in the cement sheath; or

(4) Running drill pipe[~~, wireline,~~] or other mechanical devices into or out of the wellbore WITH THE EXCEPTION OF A WIRELINE USED TO DETERMINE THE TOP OF CEMENT.

[(c)] (d) Where special cement or additives are used, the operator may request approval from the Department to reduce the cement setting time specified in subsection **[(b)] (d)**.

(e) The operator shall notify the Department a minimum of one day before cementing of the surface casing begins, unless the cementing operation begins within 72 hours of commencement of drilling.

(f) A copy of the cement job log must be available at the well site for inspection by the Department during drilling operations. THE CEMENT JOB LOG MUST

INCLUDE THE MIX WATER TEMPERATURE AND PH, TYPE OF CEMENT WITH LISTING AND QUANTITY OF ADDITIVE TYPES, THE VOLUME, YIELD AND DENSITY IN POUNDS PER GALLON OF THE CEMENT AND THE AMOUNT OF CEMENT RETURNED TO THE SURFACE, IF ANY. CEMENTING PROCEDURAL INFORMATION MUST INCLUDE A DESCRIPTION OF THE PUMPING RATES IN BARRELS PER MINUTE, PRESSURES IN POUNDS PER SQUARE INCH, TIME IN MINUTES AND SEQUENCE OF EVENTS DURING THE CEMENTING OPERATION.

(G) The cement job log shall be maintained by the operator after drilling operations for at least five years and be made available to the Department upon request.

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OPERATING WELLS

§ 78.88. Mechanical integrity of operating wells.

(a) Except for wells regulated under Subchapter H (relating to Underground gas storage) AND WELLS THAT HAVE BEEN GRANTED INACTIVE STATUS, the operator shall inspect each operating well at least quarterly to ensure it is in compliance with the well construction and operating requirements of this chapter and the Act. The results of the inspections shall be recorded and retained by the operator for at least five years and shall be available for review by the Department and the coal owner or operator.

(b) At a minimum, inspections must determine:

(1) The well-head pressure or water level measurement;

(2) The open flow on the annulus of the production casing or the annulus pressure if the annulus is shut in;

(3) If there is evidence of gas escaping from the well and the amount escaping, using measurement or best estimate of quantity;

(4) If there is evidence of progressive corrosion, rusting or other signs of equipment deterioration.

(c) For structurally sound wells in compliance with §78.73(c), the operator shall follow the reporting schedule outlined in subsection (e).

(d) For wells exhibiting progressive corrosion, rusting or other signs of equipment deterioration that compromise the integrity of the well, or the well is not in compliance with §78.73(c), the operator shall immediately notify the Department and take corrective actions to repair or replace defective equipment or casing or

mitigate the excess pressure on the surface casing seat[,] OR coal protective casing seat [~~or intermediate casing seat when the intermediate casing is used in conjunction with the surface casing to isolate fresh groundwater~~] according to the following hierarchy:

(1) The operator shall reduce the shut-in or producing back pressure on the casing seat to achieve compliance with § 78.73(c).

(2) The operator shall retrofit the well by installing production casing to reduce the pressure on the casing seat to achieve compliance with § 78.73(c). The annular space surrounding the production casing must be open to the atmosphere. The production casing shall be either cemented to the surface or installed on a permanent packer. The operator shall notify the Department at least seven days prior to initiating the corrective measure.

(3) Additional mechanical integrity tests, including but not limited to pressure tests, may be required by the Department to demonstrate the integrity of the well.

(e) The operator shall submit an annual report to the Department identifying the compliance status of each well with the mechanical integrity requirements of this section. The report shall be submitted on forms prescribed by, and available from, the Department or in a similar manner approved by the Department.

§ 78.89. Gas migration response.

(a) When an operator or owner is notified of or otherwise made aware of a POTENTIAL natural gas migration incident, the operator shall immediately [~~notify the Department and, if so directed by the Department,~~] conduct an investigation of the incident. The purpose of the investigation is to determine the nature of the incident, assess the potential for hazards to public health and safety, and mitigate any hazard posed by [~~the levels of natural gas~~] THE CONCENTRATIONS OF STRAY NATURAL GAS. [~~The operator, in conjunction with the Department and local emergency response agencies, shall take measures necessary to ensure public health and safety.~~]

(b) The investigation undertaken by the operator pursuant to subsection (a) shall include, but not be limited to:

(1) [~~An~~] A SITE VISIT AND interview with the complainant to obtain information about the complaint and to assess the reported [~~problem~~] NATURAL GAS MIGRATION INCIDENT;

(2) A field survey to assess the presence and concentrations of natural gas and aerial extent of the stray natural gas; and

(3) If necessary, [~~Establishment of~~] establish monitoring locations at potential sources, in potentially impacted structures, and the subsurface [~~if necessary~~].

~~(c) If the level of natural gas is greater than 10 percent of the lower explosive limit of natural gas, the operator shall:~~

~~(1) Immediately notify the local emergency response agency, police and fire departments and the Department;~~

~~(2) Conduct an immediate field survey of the operator's adjacent oil or gas wells to assess the wells for mechanical integrity, defective casing or cementing, and excess pressures within any part of the well. The initial area of assessment shall include wells within 2,500 feet and expanded to a greater distance if necessary as determined by the Department;~~

~~(3) Initiate mitigation controls, which may include remedial measures, access control, advisories, evacuation, signs and other actions;~~

~~(d) The operator shall take action to correct any defect in the oil and gas wells to mitigate the stray gas incident.~~

~~(e) The operator and owner shall report to the Department by phone within 12 hours after the interview with the complainant and field survey of the natural gas levels. A follow-up report shall be filed in writing with the Department within three days of the complaint. This follow-up report must include the results of the investigation, monitoring results and measures taken by the operator to repair any defects at any of the adjacent oil and gas wells.]~~

(C) IF COMBUSTIBLE GAS IS DETECTED INSIDE A BUILDING OR STRUCTURE AT CONCENTRATIONS EQUAL TO OR GREATER THAN 10% OF THE LOWER EXPLOSIVE LIMIT (L.E.L.), THE OPERATOR SHALL:

(1) IMMEDIATELY NOTIFY THE DEPARTMENT, LOCAL EMERGENCY RESPONSE AGENCY, GAS AND ELECTRIC UTILITY COMPANIES, POLICE AND FIRE DEPARTMENTS AND, IN CONJUNCTION WITH THE DEPARTMENT AND LOCAL EMERGENCY RESPONSE AGENCIES, TAKE MEASURES NECESSARY TO ENSURE PUBLIC HEALTH AND SAFETY;

(2) INITIATE MITIGATION MEASURES NECESSARY TO CONTROL AND PREVENT FURTHER MIGRATION;

(3) IMPLEMENT THE ADDITIONAL INVESTIGATION AND MITIGATION MEASURES AS PROVIDED IN SUBSECTION (E)(1) – (5) .

(D) THE OPERATOR SHALL NOTIFY THE DEPARTMENT AND, IN CONJUNCTION WITH THE DEPARTMENT, TAKE MEASURES NECESSARY TO ENSURE PUBLIC HEALTH AND SAFETY, IF SUSTAINED DETECTABLE CONCENTRATIONS OF COMBUSTIBLE GAS SATISFY ANY OF THE FOLLOWING:

(1) GREATER THAN 1% AND LESS THAN 10% OF THE L.E.L., IN A BUILDING OR STRUCTURE;

(2) EQUAL TO OR GREATER THAN 25% OF THE L.E.L. IN A WATER WELL HEAD SPACE;

(3) DETECTABLE IN THE SOILS; OR

(4) EQUAL TO OR GREATER THAN 7 MG/L DISSOLVED METHANE IN WATER.

(E) THE DEPARTMENT MAY REQUIRE THE OPERATOR TO TAKE THE FOLLOWING ADDITIONAL ACTIONS:

(1) CONDUCT A FIELD SURVEY TO ASSESS THE PRESENCE AND CONCENTRATIONS OF COMBUSTIBLE GAS AND THE AREAL EXTENT OF THE COMBUSTIBLE GAS IN THE SOILS, SURFACE WATER BODIES, WATER WELLS, AND OTHER POTENTIAL MIGRATION PATHWAYS;

(2) COLLECT GAS AND/OR WATER SAMPLES AT A MINIMUM FOR MOLECULAR AND STABLE CARBON AND HYDROGEN ISOTOPE ANALYSES FROM THE IMPACTED LOCATIONS SUCH AS WATER WELLS, AND FROM POTENTIAL SOURCES OF THE MIGRATION SUCH AS GAS WELLS;

(3) CONDUCT AN IMMEDIATE EVALUATION OF THE OPERATOR'S ADJACENT OIL OR GAS WELLS TO DETERMINE WELL CEMENT AND CASING INTEGRITY AND TO EVALUATE THE POTENTIAL MECHANISM OF MIGRATION. THIS EVALUATION MAY INCLUDE ASSESSING PRESSURES FOR ALL CASING INTERVALS, REVIEWING RECORDS FOR INDICATIONS OF DEFECTIVE CASING OR CEMENT, APPLICATION OF CEMENT BOND LOGS, ULTRASONIC IMAGING TOOLS, GEOPHYSICAL LOGS, AND OTHER MECHANICAL INTEGRITY TESTS AS REQUIRED. THE INITIAL AREA OF ASSESSMENT SHALL INCLUDE WELLS WITHIN A RADIUS OF 2,500 FEET AND MAY BE EXPANDED IF REQUIRED BY THE DEPARTMENT;

(4) TAKE ACTION TO CORRECT ANY DEFECT IN THE OIL AND GAS WELLS TO MITIGATE THE STRAY GAS INCIDENT.

(5) ESTABLISH MONITORING LOCATIONS AND MONITORING FREQUENCY IN CONSULTATION WITH THE DEPARTMENT AT POTENTIAL SOURCES, IN POTENTIALLY IMPACTED STRUCTURES, AND THE SUBSURFACE.

(F) IF CONCENTRATIONS OF STRAY NATURAL GAS AS DEFINED IN SUBSECTIONS (C) OR (D) ARE NOT DETECTED, THE OPERATOR SHALL NOTIFY THE DEPARTMENT, AND DO THE FOLLOWING IF REQUESTED BY THE DEPARTMENT:

(1) CONDUCT ADDITIONAL MONITORING,
(2) DOCUMENT FINDINGS
(3) SUBMIT A CLOSURE REPORT.

(G) *REPORTING REQUIREMENTS* - IF CONCENTRATIONS OF STRAY NATURAL GAS ARE DETECTED INSIDE A BUILDING OR STRUCTURE AT CONCENTRATIONS EQUAL TO OR GREATER THAN 10% OF THE L.E.L., THE OPERATOR AND OWNER SHALL FILE A REPORT WITH THE DEPARTMENT BY PHONE AND EMAIL WITHIN 24 HOURS AFTER THE INTERVIEW WITH THE COMPLAINANT AND FIELD SURVEY OF THE EXTENT OF STRAY NATURAL GAS. ADDITIONAL DAILY OR WEEKLY REPORTS SHALL BE SUBMITTED IF REQUESTED BY THE DEPARTMENT.

(D) FOR ALL STRAY NATURAL GAS MIGRATION INCIDENTS, A FINAL WRITTEN REPORT DOCUMENTING THE RESULTS OF THE INVESTIGATION SHALL BE SUBMITTED TO THE DEPARTMENT FOR APPROVAL WITHIN 30 DAYS OF THE CLOSE OF THE INCIDENT, OR IN A TIMEFRAME OTHERWISE APPROVED BY THE DEPARTMENT. THE FINAL REPORT SHALL INCLUDE THE FOLLOWING

(1) DOCUMENTATION OF ALL RESULTS OF THE INVESTIGATION, INCLUDING ANALYTICAL DATA, MONITORING RESULTS
(2) OPERATIONAL CHANGES ESTABLSIHED AT THE OPERATOR'S OIL AND GAS WELLS IN PENNSYLVANIA
(3) MEASURES TAKEN BY THE OPERATOR TO REPAIR ANY DEFECTS AT ANY OF THE INVESTIGATED OIL AND GAS WELLS.

(E) ALL REPORTS SUBMITTED IN ACCORDANCE WITH THIS SECTION THAT CONTAIN AN ANALYSIS OF GEOLOGICAL OR ENGINEERING DATA SHALL BE PREPARED AND SEALED BY A PENNSYLVANIA LICENSED GEOLOGIST OR ENGINEER.

PLUGGING

§ 78.92. Wells in coal areas—surface or coal protective casing is cemented.

(a) In a well underlain by a workable coal seam, where the surface casing or coal protective casing is cemented and the production casing is not cemented or the production casing is not present, the owner or operator shall plug the well as follows:

(1) The retrievable production casing shall be removed **by applying a pulling force at least equal to the casing weight plus 5000 pounds or 120% whichever is greater. If this fails, an attempt shall be made to separate the casing by cutting, ripping, shooting or other method approved by the Department, and making a second attempt to remove the casing by exerting a pulling force equal to the casing weight plus 5,000 pounds or 120 percent of the casing weight, whichever is greater. [and the] The** well shall be filled with nonporous material from the total depth or attainable bottom of the well, to a point **50 feet** below **[20 feet above the top of]** the lowest stratum bearing or having borne oil, gas or water. At this point there shall be placed a plug of cement, which shall extend for at least 50 feet above **this stratum [that point]. Each overlying formation bearing or having borne oil, gas or water shall be plugged with cement a minimum of 50 feet below this formation to a point 50 feet above this formation. The zone between cement plugs shall be filled with nonporous material. [Between this sealing plug and a point 20 feet above the next higher stratum bearing or having borne oil, gas or water, the hole shall be filled with nonporous material and at that point there shall be placed another 50-foot plug of cement which] The cement plugs shall be placed in a manner that** will completely seal the hole. **[In like manner, the hole shall be filled and plugged, with reference to each of the strata bearing or having borne oil, gas or water.]** The operator may treat multiple strata as one stratum and plug as described in this subsection with a single column of cement or other materials approved by the Department. Where the production casing is not retrievable, the operator shall plug that portion of the well under § 78.91(d) (relating to general provisions).

* * * * *

(b) The owner or operator shall plug a well, where the surface casing, coal protective casing and production casing are cemented, as follows:

* * * * *

(3) Following the plugging of the cemented portion of the production casing, the uncemented portion of the production casing shall be separated from the cemented portion and retrieved **by applying a pulling force at least equal to the casing weight plus 5000 pounds or 120% whichever is greater. If this fails, an attempt shall be made to separate the casing by cutting, ripping, shooting or other method approved by the Department, and making a second attempt to remove the casing by exerting a pulling force equal to the casing weight plus 5,000 pounds or 120 percent of the casing weight, whichever is greater** . The maximum distance the stub of the uncemented portion of the production casing may extend is 100 feet below the surface or coal protective casing whichever is lower. In no case may the uncemented portion of the

casing left in the well extend through a formation bearing or having borne oil, gas or water. Other stratum above the cemented portion of the production casing bearing or having borne oil, gas or water shall be plugged by filling the hole with nonporous material to 20 feet above the stratum and setting a 50-foot plug of cement. The operator may treat multiple strata as one stratum and plug as described in this subsection with a single column of cement or other material as approved by the Department. When the uncemented portion of the production casing is not retrievable, the operator shall plug that portion of the well under § 78.91(d).

§ 78.93. Wells in coal areas—surface or coal protective casing anchored with a packer or cement.

(a) In a well where the surface casing or coal protective casing and production casing are anchored with a packer or cement, the owner or operator shall plug the well as follows:

(1) The retrievable production casing shall be removed **by applying a pulling force at least equal to the casing weight plus 5000 pounds or 120% whichever is greater. If this fails, an attempt shall be made to separate the casing by cutting, ripping, shooting or other method approved by the Department, and making a second attempt to remove the casing by exerting a pulling force equal to the casing weight plus 5,000 pounds or 120 percent of the casing weight, whichever is greater.**

[and the] **The** well shall be filled with nonporous material from the total depth or attainable bottom of the well, to a point **50 feet below** **[20 feet above the top of]** the lowest stratum bearing or having borne oil, gas or water. At this point there shall be placed a plug of cement, which shall extend for at least 50 feet above **this stratum** **[that point]. Each overlying formation bearing or having borne oil, gas or water shall be plugged with cement a minimum of 50 feet below this formation to a point 50 feet above this formation. The zone between cement plugs shall be filled with nonporous material. [Between this sealing plug and a point 20 feet above the next higher stratum bearing or having borne oil, gas or water, the hole shall be filled with nonporous material and at that point there shall be placed another 50-foot plug of cement which]** **The cement plugs shall be placed in a manner that** will completely seal the hole. **[In this manner, the hole shall be filled and plugged, with reference to each of the strata bearing or having borne oil, gas or water.]** The operator may treat multiple strata as one stratum and plug as described in this subsection with a single column of cement or other material as approved by the Department. When the production casing is not retrievable, the operator shall plug this portion of the well under § 78.91(d) (relating to general provisions).

(2) The well shall then be filled with nonporous material to a point approximately 200 feet below the lowest workable coal seam, or surface or coal protective casing seat, whichever is deeper. Beginning at this point a 100-foot plug of cement shall be installed.

(3) After it has been established that the surface casing or coal protective casing is free and can be retrieved, the surface or coal protective casing shall be retrieved **by applying a pulling force at least equal to the casing weight plus 5000 pounds or 120%**

whichever is greater. If this fails, an attempt shall be made to separate the casing by cutting, ripping, shooting or other method approved by the Department, and making a second attempt to remove the casing by exerting a pulling force equal to the casing weight plus 5,000 pounds or 120 percent of the casing weight, whichever is greater. **[and a]** **A** string of casing with an outside diameter of not less than 4 1/2 inches for gas wells, or not less than 2 inches for oil wells, shall be run to the top of the 100-foot plug described in paragraph (2) and cemented to the surface.

* * * * *

§ 78.94. Wells in noncoal areas—surface casing is not cemented or not present.

(a) The owner or operator shall plug a noncoal well, where the surface casing and production casing are not cemented, or is not present as follows:

(1) The retrievable production casing shall be removed **by applying a pulling force at least equal to the casing weight plus 5000 pounds or 120% whichever is greater. If this fails, an attempt shall be made to separate the casing by cutting, ripping, shooting or other method approved by the Department, and making a second attempt to remove the casing by exerting a pulling force equal to the casing weight plus 5,000 pounds or 120 percent of the casing weight, whichever is greater.** The well shall be filled with nonporous material from the total depth or attainable bottom of the well, to a point **50 feet below [20 feet above the top of]** the lowest stratum bearing or having borne oil, gas or water. At this point there shall be placed a plug of cement, which shall extend for at least 50 feet above **this stratum [that point]. Each overlying formation bearing or having borne oil, gas or water shall be plugged with cement a minimum of 50 feet below this formation to a point 50 feet above this formation. The zone between cement plugs shall be filled with nonporous material. [Between this sealing plug and a point 20 feet above the next higher stratum bearing or having borne oil, gas or water, the hole shall be filled with nonporous material and at that point there shall be placed another 50-foot plug of cement which] The cement plugs shall be placed in a manner that** will completely seal the hole. **[The hole shall be filled and plugged, with reference to each of the strata bearing or having borne oil, gas or water.]** The operator may treat multiple strata as one stratum and plug as described in this paragraph with a single column of cement or other materials as approved by the Department. When the production casing is not retrievable, the operator shall plug this portion of the well under § 78.91(d) (relating to general provisions).

(2) After plugging strata bearing or having borne oil, gas or water, the well shall be filled with nonporous material to approximately 100 feet below the surface casing seat and there shall be placed another plug of cement or other equally nonporous material approved by the Department extending at least 50 feet above that point.

(3) After setting the uppermost 50-foot plug, the retrievable surface casing shall be removed **by applying a pulling force at least equal to the casing weight plus 5000 pounds or 120% whichever is greater. If this fails, an attempt shall be made to**

separate the casing by cutting, ripping, shooting or other method approved by the Department, and making a second attempt to remove the casing by exerting a pulling force equal to the casing weight plus 5,000 pounds or 120 percent of the casing weight, whichever is greater. [and the] The hole shall be filled from the top of the 50-foot plug to the surface with nonporous material other than gel. If the surface casing is not retrievable, the hole shall be filled from the top of the 50-foot plug to the surface with a noncementing material.

* * * * *

§ 78.95. Wells in noncoal areas—surface casing is cemented.

(a) The owner or operator shall plug a well, where the surface casing is cemented and the production casing is not cemented or not present, as follows:

(1) The retrievable production casing shall be removed **by applying a pulling force at least equal to the casing weight plus 5000 pounds or 120% whichever is greater. If this fails, an attempt shall be made to separate the casing by cutting, ripping, shooting or other method approved by the Department, and making a second attempt to remove the casing by exerting a pulling force equal to the casing weight plus 5,000 pounds or 120 percent of the casing weight, whichever is greater. [and] T[t]**he well shall be filled with nonporous material from the total depth or attainable bottom of the well, to a point **50 feet below [20 feet above the top of]** the lowest stratum bearing or having borne oil, gas or water. At this point there shall be placed a plug of cement, which shall extend for at least 50 feet above **this stratum [that point]. Each overlying formation bearing or having borne oil, gas or water shall be plugged with cement a minimum of 50 feet below this formation to a point 50 feet above this formation. The zone between cement plugs shall be filled with nonporous material. [Between this sealing plug and a point 20 feet above the next higher stratum bearing or having borne oil, gas or water, the hole shall be filled with nonporous material and at that point there shall be placed another 50-foot plug of cement] The cement plugs shall be placed in a manner that will completely seal the hole. [The hole shall be filled and plugged, with reference to each of the strata bearing or having borne oil, gas or water.]** The operator may treat multiple strata as one stratum and plug as described in this subsection with a single column of cement or other materials as approved by the Department. When the production casing is not retrievable, the operator shall plug this portion of the well under § 78.91(d) (relating to general provisions).

* * * * *

§ 78.96. Marking the location of a plugged well**.**

(a) Upon the completion of plugging or replugging a well, the operator shall erect over the plugged well a permanent marker of concrete, metal**, plastic or equally durable material [or metal and concrete].** The marker shall extend at least 4 feet above the ground surface and enough below the surface to make the marker permanent. **Cement**

may be used to hold the marker in place provided the cement does not prevent inspection of the adequacy of the well plugging. The permit or registration number shall be stamped or cast or otherwise permanently affixed to the marker. In lieu of placing the marker above the ground surface, the marker may be buried below plow depth and shall contain enough metal to be detected at the surface by conventional metal detectors

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SUBCHAPTER E. WELL REPORTING

§ 78.121. **[Annual] P[p]**roduction report**ing.**

(a) The well operator shall submit an annual production and status report for each **PERMITTED OR REGISTERED** well on an individual basis, on or before **[March 31] February 15** of each year. **The operator of a well [~~which produces gas~~] PERMITTED TO PRODUCE GAS from the Marcellus shale formation shall submit a production and status report for each well on an individual basis, on or before February 15 and August 15 of each year.** Production shall be reported for the preceding calendar year **or in the case of a Marcellus shale well, for the preceding six months**. When the production data is not available to the operator on a well basis, the operator shall report production on the most well-specific basis available. The annual production report [~~**shall**~~] **MUST** include information on the amount and type of waste produced and the method of waste disposal or reuse. Waste information submitted to the Department in accordance with this subsection [~~**shall**~~] **IS DEEMED TO** satisfy the residual waste biennial reporting requirements of § 287.52 (relating to biennial report).

(b) The **[~~annual~~]** production report shall be submitted **ELECTRONICALLY TO THE DEPARMENT THROUGH ITS WEBSITE.[on forms prescribed by, and available from, the Department or in a similar manner approved by the Department.]**

§ 78.122. Well record and completion report**.**

(a) For each well that is drilled or altered, the operator shall keep a detailed drillers log at the well site available for inspection until drilling is completed. Within 30 calendar days of cessation of drilling or altering a well, the well operator shall submit a well record to the Department on a form provided by the Department that includes the following information:

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(6) Size and depth of conductor pipe, surface casing, coal protective casing, **INTERMEDIATE CASING,** production casing and borehole.

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[~~(9)~~] (10) A certification by the operator that the well has been constructed in accordance with this chapter and any permit conditions imposed by the Department.

[(10)] 11 Other information required by the Department.

(b) Within 30 calendar days after completion of the well, the well operator shall submit a completion report to the Department on a form provided by the Department that includes the following information:

(1) Name, address and telephone number of the permittee.

(2) Name, address and telephone number of the service companies.

(3) Permit number and farm name and number.

(4) Township and county.

(5) Perforation record.

(6) Stimulation record **WHICH INCLUDES THE FOLLOWING:** [~~**including pump rates, pressure, total volume and list of hydraulic fracturing chemicals used, the volume of water used, and identification of water sources used pursuant to an approved water management plan.**~~]

(I) A DESCRIPTIVE LIST OF THE CHEMICAL ADDITIVES IN THE STIMULATION FLUID, INCLUDING ANY ACID, BIOCIDE, BREAKER, BRINE, CORROSION INHIBITOR, CROSSLINKER, DEMULSIFIER, FRICTION REDUCER, GEL, IRON CONTROL, OXYGEN SCAVENGER, PH ADJUSTING AGENT, PROPPANT, SCALE INHIBITOR, AND SURFACTANT;

(II) THE PERCENT BY VOLUME OF EACH CHEMICAL ADDITIVE IN THE STIMULATION FLUID;

(III) A LIST OF THE CHEMICALS IN THE MATERIAL SAFETY DATA SHEETS, BY NAME AND CHEMICAL ABSTRACT SERVICE NUMBER, CORRESPONDING TO THE APPROPRIATE CHEMICAL ADDITIVE;

(IV) THE PERCENT BY VOLUME OF EACH CHEMICAL LISTED IN THE MATERIAL SAFETY DATA SHEETS;

(V) THE TOTAL VOLUME OF THE BASE FLUID;

(VI) A LIST OF WATER SOURCES USED PURSUANT TO AN APPROVED WATER MANAGEMENT PLAN AND THE VOLUME OF WATER USED FROM EACH SOURCE;

(VII) THE TOTAL VOLUME OF RECYCLED WATER USED; AND

(VIII) THE PUMP RATE AND PRESSURE USED IN THE WELL.

(7) Actual open flow production and **[rock]** [~~**reservoir**~~**]** **SHUT IN SURFACE** pressure.

(8) Open flow production and **[rock]** [~~**reservoir**~~**]** **SHUT IN SURFACE** pressure, measured 24 hours after **[treatment]** **completion**.

(c) [~~No information described in subsection (b)(5)—(8) will be required as part of the report unless the operator has had the information compiled in the ordinary course of business. No interpretation of the data is to be filed.~~] **WHEN THE WELL OPERATOR SUBMITS A STIMULATION RECORD, IT MAY DESIGNATE SPECIFIC PORTIONS OF THE STIMULATION RECORD AS CONTAINING A TRADE SECRET OR CONFIDENTIAL PROPRIETARY INFORMATION. THE DEPARTMENT SHALL PREVENT DISCLOSURE OF SUCH DESIGNATED CONFIDENTIAL INFORMATION TO THE EXTENT PERMITTED BY THE RIGHT TO KNOW LAW, 65 P.S. 67.101 ET SEQ.**

(D) IN ADDITION TO SUBMITTING A STIMULATION RECORD TO THE DEPARTMENT PURSUANT TO SUBSECTION (B), AND SUBJECT TO THE PROTECTIONS AFFORDED FOR TRADE SECRETS AND CONFIDENTIAL PROPRIETARY INFORMATION UNDER THE RIGHT TO KNOW LAW, 65 P.S. 67.101 ET SEQ., THE OPERATOR SHALL ARRANGE TO PROVIDE A LIST OF THE CHEMICAL CONSTITUENTS OF THE CHEMICAL ADDITIVES USED TO HYDRAULICALLY FRACTURE A WELL, BY CHEMICAL NAME AND ABSTRACT SERVICE NUMBER, UNLESS THE ADDITIVE DOES NOT

HAVE SUCH A NUMBER, TO THE DEPARTMENT UPON WRITTEN REQUEST BY THE DEPARTMENT.

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