

## Summary of Comments to Proposed Amendments to 25 Pa. Code Chapter 78

On January 30, 2010, the Department published proposed amendments to 25 Pa. Code Chapter 78 in the Pa. Bulletin for public comment pursuant to the Advanced Notice of Proposed Rulemaking process. 40 Pa. B. 623. The public comment period closed March 2, 2010. The Department received comments from 87 individuals, businesses, trade organizations and public interest groups.

The Advanced Notice of Proposed Rulemaking (“ANPR”) procedure is an informal process. The purpose of using the process is to solicit multiple rounds of public comment on these proposed regulatory changes. Through the ANPR process, the Department obtained valuable comments that warrant additional consideration by interested stakeholders as the regulations move through the formal rulemaking process. Areas where additional comments are requested are described below.

The Department also received numerous comments concerning issues beyond the scope of these proposed changes or beyond the scope of the Department’s statutory authority. It is important to note that these proposed regulatory changes are limited to protecting public safety and groundwater resources through proper well construction, water supply replacement or restoration, well inspection, gas migration investigation and response, and well plugging.

The Department has determined that these issues must be addressed expeditiously. While other potential impacts to the environment from oil and gas well development warrant consideration, such an evaluation will unduly delay the promulgation of these important regulations. The Department intends to engage in another round of rulemaking to address additional issues presented by development of the Marcellus Shale and other unconventional resources such as coalbed methane.

As noted, the ANPR process is an informal one. As such, a detailed comment/response document is not necessary. While the Department has read and thoroughly considered every comment submitted, it will not specifically address each comment in this document or in the regulation. To the extent that comments were considered and accepted, acceptance may simply be reflected in revisions to the proposed regulation. To the extent that commentators do not believe their comments have been sufficiently addressed, they may submit additional comments on the regulation as part of the formal rulemaking process and the Department will address them through a formal comment/response document.

### **Comments Beyond the Scope of the Proposed Regulations**

Clean Water Action submitted comments on behalf of 33 individuals. These comments were a form letter that requested the Department to address air quality issues associated with oil and gas well drilling. Individual comments were also appended to the form letter. Individuals requested a moratorium on well drilling until further study of the environmental impacts associated with gas well drilling are conducted, monitoring of air emissions from wastewater treatment and gas well flaring, and monitoring of naturally occurring radioactive materials associated with well drilling. Similar comments were received by several other individuals as well.

Protecting Pennsylvania's air quality is important. The Department is currently evaluating the potential air quality impacts of gas well drilling, gas processing and transmission. However, regulation of these potential impacts is outside the scope of the proposed changes to 25 Pa. Code Chapter 78. The particular focus of these amendments pertains to protecting public safety and groundwater resources through proper well construction, water supply replacement or restoration, well inspection, gas migration investigation, and well plugging.

It is important that the scope of the regulations remain focused so that the revisions can be implemented expeditiously. Significantly expanding the scope of the proposal to include every issue suggested by Clean Water Action members would require additional study and severely delay the development of regulations that are critical to protecting public welfare and the environment.

With respect to issuing a moratorium on well drilling until all potential environmental impacts of well drilling have undergone a cost benefit analysis and other studies, the Department does not have the statutory authority to impose such a moratorium.

The Pennsylvania Campaign for Clean Water submitted comments on behalf of Clean Water Action, Protecting Our Waters, Chestnut Ridge Trout Unlimited, Delaware Riverkeeper Network, Pennswood Village Environmental Concerns Committee, and Sierra Club, Pennsylvania Chapter. These comments requested minimum penalties or work stoppages for violations, the ability of citizens to initiate enforcement action by DEP, expanded requirements for and public access to driller's logs, and a restatement of a municipality's authority to regulate activities associated with well drilling and gathering line regulation.

Establishing minimum penalties or work stoppages is not appropriate for these regulations. The Department has a civil penalty policy that takes into account important considerations such as mental state, prior history and impact to the environment prior to penalty assessment. See policy number 550-4000-001. The Department must also abide by legislative mandates regarding work stoppages. The Oil and Gas Act specifies when cease orders may be issued. See 58 P.S. § 601.503.

The public's involvement in well permitting is also specified in the Oil and Gas Act. See sections 201 and 501 of the Act. (58 P.S. §§ 601.201, 601.501). Where citizens observe violations occurring, it is extremely important that they contact the nearest DEP regional office. With regard to access to driller's logs, DCNR maintains the log information that is submitted as part of the well drilling and completion reports. See the Oil and Gas Reports and Reference page here: <http://www.dcnr.state.pa.us/topogeo/oilandgas/resrefs.aspx>

Finally, it is not appropriate for the Department to opine on the full extent of the ability of municipalities to regulate well drilling activities. The Pennsylvania Supreme Court recently issued opinions on this matter and the holdings speak for themselves. Other issues that are beyond the scope of the regulation or are beyond DEP's statutory authority include:

- 1) Preclude drilling beneath properties without the consent of the land owner. (Julius and Barbara Spartacus). DEP does not have this authority.
- 2) Require water supply testing before drilling. (Julius and Barbara Spartacus). DEP does not have this authority. Failure to test results in presumption of contamination. See 58 P.S. § 601.208.
- 3) Require water supply testing to be conducted by 3<sup>rd</sup> parties – prohibit operators from contracting with labs. (Campaign for Clean Water). All testing must be performed by accredited laboratories. 25 Pa. Code § 78.52(c).
- 4) Establish standard parameters for water supply testing (multiple commentators). Testing water supplies is not required. Establishing a required set of parameters could eliminate the presumption of contamination for non-listed parameters. DEP will be posting a suggested list of testing parameters on its website.
- 5) Incorporate legislative proposals in HB 2213 (unidentified email comment). These amendments require legislative action.
- 6) Require immediate (temporary) water supply replacement upon complaint of supply owner and require prescribed DEP action for replacement orders. (Multiple commentators). Section 209 of the Act prescribes water supply replacement procedures and requirements. 58 P.S. § 601.209.
- 7) Require “green completion” techniques (flare restrictions and methane recapture).
- 8) Develop regulations for pipelines. The Department does not have clear statutory authority to regulate natural gas gathering line construction standards. The Pennsylvania Public Utility Commission is currently investigating this issue. A hearing will be held April 22, 2010.  
[http://www.puc.state.pa.us/General/press\\_releases/Press\\_Releases.aspx?ShowPR=2475](http://www.puc.state.pa.us/General/press_releases/Press_Releases.aspx?ShowPR=2475)

## **Comments by section**

### **25 Pa. Code § 78.1 - Definitions**

Casing Seat: Several commentators requested that the second sentence in the definition of “casing seat” be deleted. This sentence refers to wells that were drilled prior to the passage of the Oil and Gas Act. New wells may not be drilled without, at least, surface casing. Retaining the concept of the second sentence is necessary as the depth of the casing seat (or what should be the casing seat) is important in determining such things as inactive status of a well. The concept of this requirement is retained but the requirement has changed to reflect a new proposed standard to which surface casing must be set. (100 feet below the deepest fresh groundwater zone).

Cement: Several commentators – such as Earth Justice and Sierra Club, requested amendments to the definition of cement (and related provisions). The specific recommendation is as follows:

Revise the cement definition to include a 72-hour compressive strength standard of 1,200 psi for cement mixtures in **the zone of critical cement**. Also, require conformance with the API free water separation standard of no more than six milliliters per 250 milliliters of cement tested in accordance with the current API RP 10B. Provide a provision for the Department to set more stringent local standards if needed for pollution prevention, and establish quantitative temperature limits for water used in cement mixing. The cement definition should clarify that it applies to cement used for surface, intermediate, and production casing. (Emphasis added)

The Department is requesting additional comments on this suggestion – particularly on the concept of creating a zone of critical cement at the casing seat.

Cement Ticket: The Department has renamed this definition as Cement Job Log and revised the contents of the log pursuant to comments received by numerous commentators including the Oil and Gas Technical Advisory Board.

Deepest Fresh Groundwater: Several commentators requested that the Department define what constitutes fresh groundwater. The purpose of this request is to establish the depth to which surface casing should be set. The current definition of deepest fresh groundwater is: “The deepest fresh groundwater bearing formation penetrated by the wellbore as determined from drillers logs from the well or from other wells in the area surrounding the well or from historical records of the normal surface casing seat depths in the area surrounding the well, whichever is deeper.” 78.1.

This definition is not precise and may not be sufficiently protective of the water supplies. To address ambiguities as to where fresh water supplies end, the Department proposes adding an additional 50 feet onto where surface casing must be set. Additional comments on this definition and the underlying issues are requested.

Permanently Cemented: This definition currently reads: “Surface casing or coal protective casing that is cemented until cement is circulated to the surface or is cemented with a calculated volume of cement necessary to fill the theoretical annular space plus 20% excess.” Geo Resource Associates requested that the volume be increased to 200% of the theoretical annular space. Because the Department has added new requirements for when cement is not returned to the surface in 78.83b, this recommendation will not be included.

Retrievable: Several commentators (including the Independent Regulatory Review Commission and the Oil and Gas Technical Advisory Board) requested that the substantive provisions of this definition be moved to the body of the regulations.

## **25 Pa. Code 78.51 – Protection of Water Supplies**

Comments received on this section of the regulation requested further clarification of the requirements and a clear statement of who determinations that water supplies have been adequately restored or replaced (numerous commentators).

Chesapeake Energy and Earth Justice noted a redundancy in subsections 78.51(d) and 51(e).

Range Resources, the Marcellus Shale Coalition and TAB requested that the Department limit replacement obligations to restoring a supply to pre-existing conditions if the supply failed to meet safe drinking water act standards.

Environmental Defense Fund comments:

The DEP should consider generally broadening the standard for protection of water supplies. More specifically, the department should consider defining the terms “pollution” and “diminution.” “Pollution” may refer to any addition of contaminants in ground or surface waters and certainly covers any introduction of contaminants at concentrations that exceed regulatory standards. Since there are no health-based standards established for dissolved natural gas in groundwater, the DEP should adopt a definition of pollution that is broad enough to include any measurable natural gas invasion incidents.

Additionally, natural gas invasion of an aquifer can disrupt water well usage in ways that are clearly not consistent with the terms “pollution” and “diminution.” For example, the pressure front associated with a natural gas invasion incident may disrupt water usage by causing groundwater to flow artesian from a water well or free gas exsolving from groundwater may cause a pump to lock persistently. Also, perturbation caused by the liberation of natural gas may persistently interrupt water use by clogging sediment filters as scale, bacteriological films and other types of well bore debris are freed by vigorous gas bubbling.

An oil or gas well owner whose operation has caused such a disruption should have the obligation to restore or replace the affected water supply. Unfortunately, these types of incidents do not meet common definitions of “pollution” or “diminution” and are therefore not covered by the provisions of § 78.51. As a result, these regulations may fail to adequately protect citizens’ water rights. We want to make certain that the DEP has the authority to protect water supplies in situations that may fall outside the scope of a limited definition of “pollution” or “diminution.”

“Once the source of pollution has been remedied, groundwater impacts remain transient and may cause relatively brief disruptions of water supply usage. In many situations, it may be preferable and cost-effective for the operator to install treatment systems that address the department’s adequacy criteria. These temporary systems could be maintained at the expense of the operator while the DEP monitors natural attenuation of parameters of interest in the groundwater for the period of time mandated by the DEP. Water treatment systems such as reverse osmosis and gas removal aeration systems are not only cost-effective, but they also place less of a burden on the affected individual who may otherwise have obtrusive water tanks or lines placed on their property. However, it is unclear if such methods are authorized under § 78.51(g), which only explicitly mention “tank trucks” and “bottled water.” We suggest that the provision specifically reference the following options in its language: “Approved water tanks, water treatment systems

(including gas removal equipment) and bottled water are acceptable only as temporary water replacement...”

Steckman Ridge comments:

We understand and fully appreciate the requirements of Section 208 of the Oil and Gas Act, 78 P.S. §601.208, and the obligations of a natural gas well operator to provide for appropriate restoration or replacement of water supplies adversely affected by well drilling or alteration activities. We believe, however, some elements of the proposed regulations may go too far in terms of creating performance standards that are either impossible to achieve, or will give rise to protracted disputes.

In particular, proposed §78.51(e)(1) would create five new criteria, mandating that a restored or replaced water supply (i) "[b]e as reliable as the previous water supply"; (ii) "[b]e as permanent as the previous water supply" (iii) "[n]ot require excessive maintenance"; (iv) "[p]rovide the owner and the user with as much control and accessibility as exercised over the previous water supply"; and (v) "[n]ot result in increased costs to operate and maintain." Each of these formulations is problematic:

"As reliable as" criterion: The "reliability" of pre-existing supplies is very difficult to determine. Pre-drilling surveys only provide a "snapshot" as to the water supply provided by a particular well, spring or other source. Many existing private water supplies (including shallow wells) are inherently vulnerable to natural reliability issues, including diminished flow during extended drought periods or the build-up of iron or other minerals that inhibit inflow over time. The "as reliable as" criterion places the gas well operator in the impossible position of trying to ascertain past reliability issues, and then providing something equal to or better than the unknowable. An alternative workable standard would be a requirement that the water supply is reasonably reliable — that is, will provide an adequate flow of water during reasonably foreseeable conditions.

"As permanent as" criterion: We are uncertain what this "permanence" concept is aimed at achieving. We assume that almost any replacement supply would be something other than temporary (i.e., trucking water). If the concept is that a less- than-permanent supply can be provided if the prior supply was not permanent, then perhaps that concept should be developed and explained in greater detail.

"Excessive maintenance" criterion: All water supplies require maintenance, including private wells and springs. Equipment must be checked, lubricated, and adjusted, and where treatment is provided (e.g., for iron, minerals or hardness), those units must be checked and maintained. The formulation of §78.51(e)(1)(iii) immediately creates the question as to what "excessive" means. We should not create a situation where the ordinary maintenance required of private water supply and treatment systems can be argued to be "excessive."

"As much control and accessibility" criterion: A number of private supplies, such as dug wells or open exposed springs, may be open and "readily accessible," but not particularly safe or sanitary. The manner in which §78.51(e)(1)(iv) is worded would ostensibly require that a gas well operator replace an open and exposed source with another open and exposed source. A more appropriate criterion is that the replacement supply provide the user with a reasonable degree of control regarding its operation and reasonable means of access for maintenance and monitoring.

"Increased costs to operate and maintain" criterion: All water systems involve operating and maintenance costs, and the attempt to impose a "new increased cost" criterion will inevitably lead to significant disputes. Landowners may complain that a public water system connection involves the risk of future unknown rate increases, while skewing the fact that operation of private wells inherently involves electric energy costs (which may increase unpredictably), and future maintenance/replacement costs for pumps, water bladders, controls, et cetera. This formulation is bound to cause the Department to become embroiled in disputes about comparative predictions of future costs — a topic on which the Department may not be particularly well prepared to address.

We believe the fundamental standard should provide that a gas well operator has met its obligation under Section 208 if the replacement water supply (i) supplies water in a quantity adequate to meet the landowner's needs and demands for current and reasonably foreseeable uses; (ii) the quality of the replacement supply used for potable purposes meets the applicable drinking water standards established under the Federal Safe Drinking Water Act and Pennsylvania Safe Drinking Water Act; and (iii) the quality of the replacement supply used for non-potable purposes is equivalent to the water in use by the landowner for that purpose prior to the alleged natural gas well activity impact. These concepts appear to be reflected in proposed §78.51(e)(2) and (3) and 78.51(f).

Range Resources comments:

The paragraph (78.51 (e)(2)) should be revised to reference the primary drinking water standards.

Dominion Transmission, Inc. comments:

The quantity and quality of the affected water shall be compared to results obtained from the baseline prealteration survey, required in subsection §78.52. Any variance existing between the physical properties of the prealteration survey samples and the post-incident existing water conditions may be reviewed, in context to extraneous circumstances, including but not limited to, seasonal conditions, quantity and quality of aquifer recharge, time frame between water samples, verification of water usage rates, and verification of water supply flow rates.

Response:

The purpose of this section is to codify current caselaw on water supply replacement requirements. Essentially, these are the standards the Department currently employs. It is appropriate to make these standards transparent so that operators and the public are aware of the requirements. Therefore, the Department does not believe that any modification to the replacement standards is warranted. To the extent that operators do not believe that a single sample evaluation adequately characterizes the water supply, they may take multiple samples over an extended period of time to more fully characterize the quality and quantity of the supply and the Department will evaluate this information in the course of any investigations.

Regardless, the Department is the entity charged with determining whether a supply has been affected and the extent of the impact. Revisions have been made to clearly reflect this.

With regard to restoration quality, the Department believes that protecting both primary and secondary standards. The Department does not require operators to restore supplies beyond safe drinking water standards if the supply previously failed those standards. However, if the supply failed a safe drinking water standard and drilling caused a further exceedance of the standard, if

the operator voluntarily installs a treatment system attains the standard, the Department will not limit the operator's treatment costs to the amount necessary to meet drinking water standards.

It should also be noted that the Department considers methane to be a pollutant that must be addressed pursuant to any water supply replacement or restoration order. With regard to EDF's comment, treatment systems may be installed as a method of permanent restoration or replacement of a supply provided funding for increased maintenance and operation of the system are provided for.

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

Geo Resource Associates comments that soil samples and water supply yield should be included in the predrilling survey and states:

As written, paragraph (c) specifies that "The survey shall be conducted by an independent certified laboratory. Further, paragraph (c) restricts sample collection, preservation, handling, and chain of custody procedures to those utilized by the laboratory. These provisions unnecessarily restrict parties who may be quite qualified to conduct such a survey, as well as the methods that may be employed, recognizing that within the industry there are substantial variations in sample collection, preservation, handling, and chain of custody procedures, while all yielding representative results. Considering these circumstances, paragraph (c) should be revised to read as flows:

The survey shall be conducted by a person independent of the well owner or operator who is 1) a representative of a independent certified laboratory who has been properly trained in applicable procedures and protocols, 2) an Professional Geologist registered in the Commonwealth of Pennsylvania, or 3) a person in responsible charge of a Professional Geologist registered in the Commonwealth of Pennsylvania who has been properly trained in applicable procedures and protocols. In any case, sample collection, preservation, handling, and chain of custody procedures shall be documented and be consistent with standard industry practices at the time and place the survey is conducted.

Environmental Defense Fund (and others) comment:

A predrilling or prealteration survey should not be restricted to groundwater quality, i.e., pollution, concerns. During a prealteration survey, the operator could also evaluate well yield, recovery and condition through a pump test. These results could provide a defense against false allegations regarding diminution and potentially save time and costs by avoiding any possible conflicts or litigation.

Steckman Ridge comments:

Currently, 25 Pa. Code §78.52 requires that a well operator who desires to preserve its defenses under Section 208(d) of the Act must conduct a predrilling survey, and provide a copy of that survey information to the Department and the landowner within 10 calendar days of being notified by DEP to submit a copy. This provision has been long established and is well understood. The proposed amendment to §78.52 would substantially alter this requirement by mandating that in order to preserve the statutory defense, the oil and gas well operator must provide a copy of the survey to the Department and landowner within 10 days of "receipt of the results." This revised formulation would create a number of serious problems:



**Retroactive Application and Abrogation of Defenses:** As written, §78.52(d) would ostensibly apply retroactively, changing the rules of the road to preclude any existing oil or gas well operator from utilizing the statutory defenses unless they had provided copies of the predrilling survey to the landowner and DEP long ago, when such predrilling surveys were conducted. Such a retroactive change in the predicates to using the statutory defense presents serious fairness and due process issues. Operators who conducted predrilling surveys and who relied on and complied with the existing regulatory language would be unfairly stripped of their statutory defenses based upon a post hoc change to the rules. Such an approach is unreasonable and untenable.

**Filing Reports Based on "Results":** Predrilling surveys are conducted over some period of time, and the information from on-site inspections and water quality analyses for public and private supplies around a prospective oil or gas well may be developed over a number of weeks or even months. Sometimes, preliminary or initial analytical results may be received and questioned, resulting in repeat testing to confirm results. Frequently, it takes some time to compile the entire predrilling survey for all sources around a proposed oil or gas well. Unfortunately, the way §78.52(d) is drafted, the statutory defense could be abrogated within a short period of time after some results are obtained, if the remainder of the survey is not completed in time to be forwarded to DEP and the landowner. This formulation is bound to result in "foot-faults" in terms of missing a very short 10-day window.

In our view, the approach set forth in the current §78.52(d) is fair and reasonable. To preserve the statutory defense, the predrilling survey must be conducted and its results are available on request. If the Department desires that predrilling survey information be submitted sooner than has been previously the practice, then these provisions should be altered to provide for submission within a reasonable time (e.g., 30 days) following completion of the full pre-drilling survey (not just some "results"). To avoid the retroactive impact issue discussed above, the current language of §78.52(d) should be preserved, and a separate provision (not linked to preserving the statutory defense) could be framed as follows:

(g)For any well drilled or altered after **[the effective date of the new regulations]**, the well operator shall provide a copy of the completed predrilling survey to the Department and the landowner or water purveyor of sources evaluated in the predrilling survey within thirty (30) days of completion of the predrilling survey.

TAB Comments:

The provisions should be modified to require the results to be submitted to the landowner or water purveyor within 10 days and to be submitted to the department upon request. This will remove a significant administrative burden on the department.

Response:

Requiring soil samples to be taken as part of the predrilling survey is beyond the scope of these regulations. In addition, water quantity is not subject to the presumptive liability provisions of the Oil and Gas Act. Requiring operators to test for yield could damage drinking water wells with no environmental benefit.

With regard to test taking, the Department does not believe that its current requirements are unduly restrictive and believes it is appropriate that the sample collector comply with the laboratories sample collection and handling procedures.

With regard to submitting test results to water supply owners and the Department, section 208 (e) of the Oil and Gas Act states: Any operator electing to preserve its defenses under subsection (d)(1) or (2) shall retain the services of an independent certified laboratory to conduct the predrilling or prealteration survey of water supplies. A copy of the results of any such survey shall be submitted to the department and the landowner or water purveyor in a manner prescribed by the department.

To the extent that the regulation changes when operators must submit test results, the Oil and Gas Act clearly permits the Department to establish when results must be submitted in order to preserve defenses. The proposed requirement is no different than one the Department could impose at the time of permit issuance. Submitting test results within 10 days should not be a burden – it is the current timeframe in 78.52 except the “starting time” is based on a request from DEP rather than receipt of the test results.

As the operator tests and re-tests a water supply prior to drilling, the operator should submit the test results to the Department and the water supply owner as the results become available. This transparency in testing is an important goal of the regulation. Receipt of these test results is in no way a burden on DEP given the valuable information the results contain.

Finally, the law does not presume retroactive effect of a regulation and it is not the intent of the Department to apply this regulation retroactively.

### **§ 78.55. Control and disposal plan**

Earth Justice and Sierra Club comment:

Revise § 78.55 to require well operators to submit a copy of their control and disposal plan for DEP review and approval prior to commencing operations to ensure compliance with Pennsylvania Environmental Protection Standards.

Response:

DEP routinely requires operators to submit their PPC plan for review when the operator first begins working in the Commonwealth. DEP also ensures that these plans are available on site. Requiring the PPC plan to be submitted with each permit application is overly burdensome on DEP and the operator and will not improve environmental performance.

### **§ 78.71. Use of safety devices—well casing**

Earth Justice and Sierra Club comment:

Amend § 78.71(a) to clearly state that sufficient casing and cement must be installed in the well to prevent contamination of ground water resources, in addition to the other purposes already listed.

Environmental Defense Fund comments:

We believe that this regulation should specify that the casing program be designed by a qualified professional and that the well casing plan be submitted to the DEP for review.

Response:

The requirements of a properly cased and cemented well are clearly specified in other sections of the regulations. This section deals with safety devices.

The Department considered the need to submit casing and cementing plans as part of the application process and determined that review of the plans at the well site is sufficient.

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

Several commentators requested that specifically requiring the use of BOPs on Marcellus wells is not needed because the concept is included in 72(a)(2) and (3).

IRRC Comments:

Subsection (c) states controls for a blow-out preventer "should" be located a "safe distance from the drilling rig." This phrase is vague, and we recommend specifying minimum distance for placing the controls for a blow-out preventer into this subsection. Also, "should" is non-regulatory language which indicates this provision is optional. We recommend that you replace "should" with "shall."

And:

In Subsection (f), how is it determined that the rated working pressure is "sufficient?"

Earth Justice and Sierra Club comment:

It is recommended that DEP improve the safety device regulations at § 78.72 to add the following diverter system specifications. A diverter system should be at least as large as the diameter of the hole that will be drilled, and the system should include a remotely operated annular pack-off device, a full-opening vent line valve, and a diverter vent line with a diameter appropriately sized for geological conditions, rig layout, and surface facility constraints.

The diverter vent line outlet should be located below the annular pack-off device, either as an integral part of the annular pack-off device or as a vent-line outlet spool immediately below it.

The actuating mechanism for the vent line valve should be integrated with the actuating mechanism for the annular pack-off device in a fail-safe manner so that the vent line valve automatically opens before full closure of the annular pack-off device. The diverter system vent line should extend at least 100 feet away from any potential sources of ignition and the drilling rig substructure, and should be secured. The diverter system area should be well marked as a "warning zone" at the vent line tip, prohibiting ignition sources, equipment, or personnel in this area.

And:

DEP regulations at § 78.72(d) and (e) should be revised to clearly state that drilling operations must cease if a BOP fails a test. The BOP must be repaired or replaced, and successfully retested, prior to resuming drilling.

Environmental Defense Fund comments:

The amendments requiring an expanded use of blow-out prevention equipment are laudable, especially the provision mandating use of blow-out prevention equipment whenever drilling in the Marcellus Shale formation. However, we would recommend that installation of blow-out prevention equipment also be made a necessary condition of any waiver of mandated set-back standards, e.g., such as those found in §§ 78.57, 78.61, 78.62 or 78.63.

In addition, if drilling into a significant pay zone using air rotary tools, the DEP should consider including standards for other components of the well control system in addition to those established for blow-out prevention equipment. The DEP should include regulating standards for the rotating airhead, blowie or flare-line, kill line, flare pits, line-security and anchorage, flaring set back and ignition. The DEP should also consider including requirements for on-location kill-fluids.

Chesapeake Energy comments:

The new requirement for pressure testing at higher values could create unnecessary safety risks. Our practice has proven over time to be adequate: 1500 psi or 85% of burst.

Response:

Revisions to the proposed regulation address many of these comments. Retaining the requirement for Marcellus Shale wells to be equipped with BOPs for clarity is appropriate.

Determining whether lines valves and fittings are of sufficient working pressure would be based on the BOP manufacturer's specifications and the rating of those items. Additional comments on the concept of establishing requirements for additional safety requirements is requested.

### **§ 78.73. General provision for well construction and operation.**

Environmental Defense Fund comments:

While the many additions to this subsection are welcome, the DEP should consider adding a provision requiring installation of pressure gauges and pressure-release valves on the surface-production casing nipples. The pressure-release valves would be rated to release natural gas into the atmosphere before annular pressures reach or exceed levels that could cause annular over-pressurization. The operator could be required to report natural gas releases from annular valves to the DEP. This report would then trigger further evaluation by the DEP and possible corrective action to isolate natural gas and prevent damage to fresh groundwater resources. We would recommend including language similar to:

“The surface casing valves must be above grade or plumbed above grade in a readily accessible condition. The operator shall maintain a gauge on the casing nipple to monitor gas pressure in the surface casing annulus. At no time shall gas be allowed to accumulate in the annulus at pressures exceeding the standard established under section 78.73. The other surface casing nipple shall have a properly functioning pressure relief valve, set to release gas, if annular pressure exceeds the pressure limit set by section 78.73.”

And:

The formula for identifying over-pressurized annular conditions— $(0.8 \times 0.433 \text{ psi/foot})$  multiplied by casing length in feet—may not be sufficiently protective in areas with a relatively deep water table. We suggest reducing the multiplier from 0.8 to 0.7.

Diane Ward comments:

An operator proposing to drill a well within one mile of an abandoned or orphan well or a well plugged using procedures less protective than those detailed in this revision of 78.92-78.95, shall forward by certified mail a copy of the well location plat showing the location of the abandoned, orphan, or previously plugged well, the drilling, casing and cementing plan for the new well and the anticipated date drilling will commence to the Department and shall submit proof of notification to the Department with the well permit application. The operator will be subsequently required to provide to the Department the well record of the abandoned or orphan well or previously plugged well. Upon request of the Department, the operator will be required to assess the orphan, abandoned, or previously plugged well for mechanical integrity, defective casing or cementing, and excess pressures and provide this assessment to the Department. The Department will determine the appropriate prerequisites to drilling the new well, which may include the plugging of the orphan or abandoned well utilizing current standards as specified in 78.92-78.95, or may specify repair/re-plugging requirements for the previously plugged well which must occur prior to the drilling of the new well.

Earth Justice and Sierra comment:

The Department should develop best flaring practices as well as green completion techniques.

Response:

The Department believes it has appropriately addressed surface casing pressure requirements and remediation measures for when pressures are exceeded.

A survey and assessment of surrounding abandoned wells may be useful to the Department but should not be a prerequisite for well permitting. If well drilling or stimulation causes communication with an abandoned well such that there is the threat to pollution of waters of the Commonwealth, the Department has the authority to order the well operator to remedy the situation.

Finally, best flaring practices is a concept the Department will consider addressing through the development of a guidance document. As previously mentioned, green completion techniques are beyond the scope of these regulations.

### **§ 78.81. General provisions.**

Numerous commentators stated that oil and gas wells should be constructed according to Pennsylvania public water well construction standards. In particular, requiring the diameter of the well bore be at least 3 inches greater than the outside of the casing collar or casing tube so that wells may be cemented using a tube that is placed on the outside of the surface casing (“top jobbing”).

PIPP comments:

Some member operators have had good success with using plastic pipe for both conductor and intermediate water casing in recent years. In particular, operators report that in areas of acidic water, plastic pipe is better suited to resist corrosion over time. Specifically, member operators have demonstrated the feasibility of setting and cementing (with the positive displacement method) plastic casing through coal seams followed by the installation of a second string of steel pipe (surface casing) which is then either cemented to surface or supported on a packer. This has proven to be both technically feasible and more protective of the environment and the groundwater resources than a single string of cemented steel pipe.

We ask the Department to include the provision of using plastic pipe in this matter in areas of know mine water or other corrosive water.

Response:

Requiring wells to be constructed according to Pennsylvania public water well construction standards was thoroughly discussed during the development of this proposal. It was determined that top jobbing a gas well was not a preferred method of cementing as this method does not necessarily form a continuous sheath of cement around the casing and could result in providing shallow gas producing formations with a pathway to fresh groundwater zones. The Department determined that use of centralizers addressed concerns with even disbursement of cement and that an open annulus on any uncemented surface casing relieved concerns over potential gas migration issues.

With regard to the use of plastic casing, this concept has merit and can be permitted through an alternative method and evaluated for its effectiveness. Language to § 78.82 has been added to the effect. The Department intends to develop additional regulations in the near future that will address broader environmental issues. The use of plastic casing can be considered at that time as well.

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

TAB comments:

The provision that the operator “demonstrates that all gas and fluids will be contained in the well” cannot be met if the operator intends to produce oil or gas. The requirement that the operator “demonstrates that the pressure in the wellbore at the casing seat is no greater than the pressure permitted in §78.73(c) is sufficient to meet the objective of this provision.

Environmental Defense Fund comments:

This provision is confusing and possibly self-contradictory. The section provides for two exceptions in which surface casing can also function as production casing. However, the wording of § 78.83(a)(1) seemingly implies a situation in which production casing is already in place (“...between the surface casing and the production pipe...”). Further clarification is necessary.

National Fuel Gas Supply Corp. comments:

The Proposed Regulations would require operators to drill the surface hole using air, freshwater, or freshwater based drilling fluid. However, fluids typically used for drilling or reworking wells and specifically for storage wells contain salts. Without the use of salt, drilling fluids may

damage formations and cause excessive caving of existing wellbores. Thus, National Fuel requests that the PADEP exempt reworked wells and specifically storage wells from this section. Alternatively, National Fuel seeks clarification that the term "freshwater based drilling fluid" does not exclude the use of salt as an additive. National Fuel believes that the PADEP may be intending to forbid the use of oil based drilling fluids when working on the surface hole.

Response:

The intent is to preclude introduction of materials in drilling the freshwater zone of the well with any materials that may contribute to pollution of the freshwater zone. The department requests additional input of the necessity of using anything but freshwater in drilling or reworking the freshwater zone of storage wells, if a storage well should be regulated differently than any other well, and what would be the required concentrations.

Earth Justice and Sierra comment:

The following language should be added to DEP regulations at § 78.83(f): Surface casing must be cemented from top to bottom and firmly affixed in a central location in the wellbore with a continuous, equally thick layer of cement around the pipe. Cement must be placed behind surface casing by the pump and plug or displacement method and a sufficient amount of cement (at least 25% excess) must be used to ensure a protective cement bond is achieved from the bottom of the casing to the top of the hole. If the excess cement does not return at the surface, the operator must take steps to remedy the failed cement job, including pumping cement down the annulus from the surface to fill any void spaces. A cement bond log must be run to verify cement integrity prior to proceeding further in the wellbore. If the cement bond log does not verify placement of a continuous, solid layer of cement behind the surface casing from the bottom of the casing to the top of the hole, an additional string of casing must be set pursuant to § 78.83b(a)(1).

Revise § 78.83(f) to read: Where potential oil or gas zones are anticipated at depths within 100 feet below the deepest fresh groundwater, the operator shall set and permanently cement surface casing prior to drilling into a stratum known to contain, or likely containing, oil or gas, to provide a protective barrier to prevent hydrocarbons from contaminating the fresh water aquifers when the well is drilled deeper. A blowout preventer must be installed prior to drilling into a pressured zone or hydrocarbons, unless waived by the Department.

DEP regulation at § 78.83(g) should be revised to remove the last line and replace it with a requirement to install cement behind the entire section of the intermediate casing string (from the casing seat to the surface), unless the operator can demonstrate it is not technically feasible to circulate cement all the way to the surface due to the depth of intermediate casing. In that case, a minimum of 600' of cement must be placed behind the casing, above the casing shoe. In all cases, the cement must be firmly affixed in the wellbore in a central location with a continuous, equally thick layer of cement around the pipe.

Revise § 78.83(c) and (h) to include American Petroleum Institute Specification (API) 10D standard for centralizers.

Response:

The above objective of centralizing the casing in the hole is accomplished by centralizers which is included in the requirements. Cementing from surface may not be the best option when cement return is not achieved. See previous response regarding "top jobbing".

78.83(i)

TAB Comment:

The department should identify in the regulation the maximum/minimum size of a coal pillar that would require the running of an additional string of casing.

Response:

The location of the well within the coal pillar is the most important aspect of drilling through the pillar. Recent mining maps may allow for operators to drill without additional casing pursuant to an alternative method.

Walter Grube comment:

[(h)] (i)--- Regarding "...50 feet deeper than the coal seam", there should be included a reference to what is recognized and/or defined as a coal seam within surrounding geologic strata. Particularly in the bituminous field there are coal seams only inches to a few feet in thickness, and not normally considered economically recoverable, but which may retain substantial water permeability which could result in adverse groundwater transport to and/or away from the drilled well. Experienced coal geologists should provide input as to what kind and location and properties of a "coal seam" should be regarded as being sufficiently significant to demand a clear definition for the purposes of this regulation.

Response:

Workable coal seam is defined in regulation and in department technical guidance.

Dominion Exploration & Production comment:

Coal Protective string. It is recommended that the department consider removing 78.83

[(h)] "...or; when a well is drilled through a coal pillar." Setting an additional string of casing is not a remedy for washouts and lost circulation in pillars that occur while drilling or most likely occur during the actual cement job. There should be a step by step approach to this which goes back to the existing law.

While drilling through a pillar;

- (1) If circulation is lost while drilling through a pillar, treat the lost circulation as if you drilled through an open mine.
- (2) If circulation is NOT lost while drilling through the pillar, but lost before obtaining the next planned casing depth, treat as if you drilled through an open mine.
- (3) If circulation is NOT lost while drilling ahead to the next planned casing depth, still use a cement basket anticipating a potential washout while cementing casing. Grout from surface if circulation to surface is not obtained.



Otherwise there is no incentive for drilling through pillars.

78.83 [(h)] (i) and 78.83 [(j)] (k) are not consistent with 78.83 b (a). Why use a cement basket in one, but not the other. Both instances represent lost circulation.

TAB Discuss this comment. First two are situations where it is likely (anticipated there will be no circulation or evidence of loss. 78.83 b (a) is in the situation were circulation is lost where it was not anticipated and a cement basket was not installed prior to the cementing operation.

### **§ 78.83a Casing and Cementing Plan**

Earth Justice and Sierra Club comment:

Revise § 78.83a(a) to require the operator to prepare and submit a casing and cementing plan to DEP for review and approval as part of the well permit application. DEP should review and approve a complete well drilling and completion plan application including a casing and cementing plan, as part of the well permitting process, so that appropriate permit stipulations may be placed in the permit. Expand § 78.83a(a)(3) to include information on the casing's collapse resistance and tensile strength. Also require information on casing age, condition, location of prior use, and prior service history. The casing and cementing plan should include a quality control and quality assurance section and should demonstrate conformance with the objectives of § 78.71, and procedures and standards of §§ 78.81-87.

Steckman Ridge comment:

New §78.83a(d) provides that any revisions to a casing and cementing plan made as the result of on-site modifications "must be documented by the operator and be available for review by the Department."

Most operators, including Steckman Ridge, track such field changes through drilling supervisor log books, with the information then compiled into daily drilling reports. We assume that (and would appreciate DEP confirmation that) such a log book/daily drilling record system is what the Department had in mind in terms of the types of documents that would meet the proposed §78.83a(d) requirement

Response:

The department expects a casing and cementing plan however standardized for a particular company should be available for the driller and cementing companies to follow. Any changes or customization to the plan made in the field to address particular well circumstances should be available in one place for review by the inspector to evaluate and discuss necessity/applicability of the changes, which should be marked in red, dated and initialed.

### **§ 78.83b Casing and cementing – lost circulation**

Environmental Defense Fund comment:

This provision should clearly state that cement should be circulated to surface behind surface casing unless it is not feasible as a result of lost circulation zones.

Also, the DEP needs to clarify whether an operator would be required to implement one of the corrective action options if the surface casing was installed with a cement basket and cement was topped off using a pour string as provided for in § 78.83(k). For situations when surface casing cannot be completely cemented as a result of lost circulation, the DEP should require the intermediate casing string to be cemented to surface, thereby re-establishing multiple layers of protection for freshwater resources by cemented casing.

Earth Justice and Sierra Club comment:

Revise § 78.83b to clearly state that if surface casing is not properly cemented in place with at least 25% excess cement returns at the surface, intermediate casing must be run and cemented in place following the recommendations made above at § 78.83.

Cement bond logs should be run to verify cement quality. The proposal to allow an operator to continue drilling into a hydrocarbon bearing zone to set production casing, in the presence of a known failed surface casing cement job, is technically unsound and environmentally hazardous, and should be deleted.

Anthony Mattucci comment:

Delete (a)(1), (a)(2), and (b)

Lack of cement return to the surface represents a failure to properly construct a well. In the absence of cement return, a gel slurry composed of sodium bentonite should be circulated to seal off fractures and stabilize the borehole. The annular space would then be cemented to the surface. If circulation of the gel is not accomplished, a cement basket would be required above the zone of lost circulation and the casing would be cemented by the displacement method. The annular space above the cement basket to the surface would be sealed by pumping the cement mixture through a tremie pipe and filling the annular space from the bottom upward in one continuous operation.

Chesapeake Energy comment:

This language needs clarification. It is difficult to determine if it pertains to a failure to get cement returns to surface OR if we lose returns during cementing surface.

Jesmar Energy comment:

- 1) In the case of shallow oil gas or coalbed methane wells; the operator should be permitted to perform a remedial cement job, by injecting cement down a trimmie line to the top of the lost circulation zone. Installing additional string of casing in a mine bore could be dangerous to the mine employees.
- 2) The operator should be allowed to cement the production string back to surface.

Response:

See prior response relating to our concerns with “top jobbing” a well.

Request additional information on scenario of an additional string being added being dangerous to miners.

Return to surface is in 78.83 b (a) (3).

TAB comment:

78.83 b(2) Change “shall” to “may” in the first line to allow the operator to cement the string if he chooses.

Response:

TAB Discuss this comment. We believe it may be better to have the production string annulus open where you have not returned cement on the surface casing.

NFG comment:

§78.83b Casing and cementing — lost circulation. This section of the Proposed Regulations would require the operator to run an additional string of casing at least 50 feet deeper than the surface casing and cement the second string of casing back to the seat of the surface or coal protective casing, where the cement is not circulated to the surface. This requirement should not apply to existing storage wells constructed in accordance with §78.401, at least in cases where the production string has been cemented to surface. The surface casing of many existing storage wells were cemented in compliance with §78.401(a)(1), which permits the use of an amount of cement equal to 120% of the calculated volume of the annular space outside the casing. In addition, National Fuel requests the PADEP to clarify if cementing the second string of casing back to the seat of the surface or coal protective casing is a minimum standard. If it is a minimum standard, then operators will be able to cement the second string back to the surface.

Marcellus Shale Coalition comment:

§78.83b(b) - Delete the word "cement" on the second line. Replace the word "logging" with the phrase "either a volumetric method or cement top log".

Some commentators requested that the department permit operators to cement production casing to the surface.

Response:

The Department revised this section to clarify that it applies when cement is not returned to the surface (or meets the definition of “permanently cemented”).

It is important to clarify that failure to return cement to the surface does not necessarily mean that the cementing job is deficient to the point that the well must be abandoned and plugged. It also does not mean that top jobbing the well will cure a cement job that has been impacted by a thief zone. As discussed previously, cementing from the surface could result in an open shallow gas producing formation that ultimately leads to a shallow gas migration problem.

The department believes that the additional string of casing – or production casing placed on a packer with the annulus open to the atmosphere – addresses potential gas pressure problems at the surface casing seat. By adding a provision that allows operators to cement production casing to the surface, the department questions whether 78.83b(a)(1) is necessary.

### **§ 78.83c. Intermediate and production casing.**

TAB and Marcellus Shale Coalition comment:

The proposed section should be eliminated. The provisions of the proposed section have no bearing on the fundamental objective of this rulemaking, which is to prevent gas migration into fresh water aquifers. The new section is also contrary to the exemption in §78.81(c).

We are also concerned that the proposed requirements could stifle innovation in technologies and methods that could improve the productivity of wells.

Inspector Comment:

83c (b) If any producing horizon is open to the well bore above the casing seat, the casing shall be cemented from the casing seat up to a point at least 600 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. Would this then permit an Intermediate string to be perforated and allow stimulation?

Environmental Defense Fund comment:

The department should reference API Specification 10-D for bow-spring casing centralizers.

There are no apparent standards for centralization of intermediate or production casing strings. Centralization is particularly important to ensure proper isolation of natural gas in horizontal Marcellus completions.

Response:

Cementing requirements for intermediate casing already exist in 78.72 and in Chapter 79. It is not clear how uncemented production casing leads to decreased productivity or loss of innovation that cannot be addressed through an alternative method. Additional comments on this issue are requested.

#### **§ 78.84. Casing standards.**

IRRC comments:

Subsection (c)(3) requires a welder to be "certified in the applicable American Petroleum Institute's standards for welding casing and pipe or an equivalent training and certification program." The regulation should specify what constitutes "an equivalent training and certification program."

Simo's Welding comments:

The requirement of "3" passes on casing is not acceptable for many reasons. The standard in the gas & oil industry has been 2 passes on casing.

Patrick Cozzi comments:

All welds should be xRayed

Range Resources comments:

All welders should be required to register.

Earth Justice and Sierra Club comment:

Revise § 78.84(c) to require new welded piping for surface and intermediate casing strings and API welder's certification. Alternatively, consider substitution of the API certification with an equivalent state welding certification training program. Allow a reasonable transition period to allow welders time to obtain this new certification.

Dominion Transmission comments:

(1) Newly installed casing, which will be or is anticipated be attached to a blow-out preventer with a pressure rating of greater than 3000 psi, shall be pressure tested. The following formula shall be used to determine the required surface test pressure:

$$(\text{Kill Fluid Density} - \text{Test Fluid Density}) \times (\text{TVD of Maximum Casing Length Being Tested}) \times (0.052) \times (1.2) = \text{Surface Test Pressure Required}$$

The calculated test pressure shall be used, unless one of the following conditions exists.

Alternative methods may then be utilized, at the approval of the Department.

(a) The pressure induced by the surface test pressure and testing fluid hydrostatic pressure exceeds 70 percent of the casing's minimum internal yield pressure rating, in any portion of the casing being tested.

(b) The pressure test is being performed by holding surface test pressure against an annular preventer and the surface pressure exceeds 70 percent of the annular preventer's working pressure.

(c) Casing connections are pressure tested during casing running operations.

(d) Pressure controlled drilling techniques are to be employed that require casing surface working pressures in excess of the requirements of the surface test pressure calculation. In this instance, the surface test pressure will be 120 percent of the maximum anticipated surface working pressure of the casing string being tested, and shall follow the following provisions:

(i) The combination of surface test pressure and testing fluid hydrostatic pressure may not exceed 70 percent of the casing's minimum internal yield pressure rating, in any portion of the casing string being tested.

(ii) If the pressure test is being performed by holding surface test pressure against an annular preventer, the surface test pressure may not exceed 70 percent of the annular preventer's rated working pressure.

(iii) The surface test pressure will serve as the maximum allowable surface operating pressure for the casing being tested, unless provisions of §78.84.b(d)(iv) apply.

(iv) In the event the fluid density in the wellbore is increased or decreased during drilling operations, the following equation shall be used to define the new maximum allowable surface operating pressure. The new maximum allowable surface operating pressure may not exceed the original surface test pressure, without approval of the Department.

$$\begin{aligned} & ((\text{Test Fluid Density} - \text{New Drilling Fluid Density}) \times (\text{TVD of} \\ & \text{Maximum Casing Length Tested}) \times (0.052)) + (\text{Surface Test Pressure}) \\ & = \text{New Maximum Allowable Surface Operating Pressure} \end{aligned}$$

(3) A passing casing pressure test shall be holding the required casing surface pressure for 30 minutes with not more than 10 percent decline. The results of all casing pressure tests shall be recorded in the driller's report.

Response:

Discuss with TAB

**§ 78.85. Cement standards**

API of PA comments:

Both ASTM C150 and API 10A specifications apply to various types of portland cement. Both specifications establish requirements for the portland cement clinker and, if needed, calcium sulfate. Both specifications provide for different Types (ASTM) or Classes (API) of cement to meet various physical and chemical requirements. The API specification is the most widely used for oil and gas well cements around the world, and is the specification used by many well service companies. Consequently, this section should include reference to both specifications. This will require operators to use cement that is manufactured to an industry standard, and the cement will meet or exceed those standards. It is recommended that the first sentence of proposed § 78.85 (a) be changed to read, “The operator shall use cement that meets or exceeds the requirements ASTM International C150 or API Specification 10.” There is currently no established or agreed upon test method for gas tightness of cement, nor how to address gas migration prevention in slurry design. There are systems that will work, each with unique applications. Because of the lack of an industry standard test method, it is recommended that the wording be changed from “Prevent gas migration” to, “Prevent gas flow in the annulus.” Preventing gas flow in the annulus would mean the design is proper, and the cement was properly placed in the well.

Response:

Both comments have been incorporated.

TAB Comments:

Modify the first sentence to read “The operator shall permit the cement to set to a minimum compressive strength of 350 pounds per square inch (psi) at the casing seat.

Responses:

There is no practical way for our inspectors to perform a measurement at casing seat. The standard is for specific grade or higher of cement that has been tested to meet the compressive strength required by a certain time when mixed as specified and if left undisturbed. The intent may be the area of critical cement to which DEP agrees and is soliciting additional input from TAB.

Dominion Transmission comments:

delete § 78.85 (b)(1) After the casing cement is placed, the operator shall permit the cement to :

(i) Set to a minimum designed compressive strength of 350 pounds per square inch (psi) at the casing seat.

(ii) Set for a minimum period of 8 hours.

(2) After the casing cement is placed and cementing operations are complete, the casing may not be disturbed by:

(i) Releasing pressure on the cement head, if float equipment check valves did not hold or float equipment was not equipped with check valves.

(ii) Nippling up on or in conjunction to the casing, unless the casing is supported by slips or other similar mechanism associated with a braden or casing head, or casing spool, or other similar device, below the point where the nipling up is occurring.

(iii) Running drill pipe, wireline, or other mechanical device into or out of the wellbore, unless such activity is associated with cementing operations.

API of PA comments:

§ 78.85 (b)(2) indicates that the operator can not disturb the casing in any manner for eight hours, to include removing pressure on the cement head. If there is a float collar and float shoe in the well, then after bumping the plug, the pressure on the cement head should be zero and remain at zero. The well will begin heating up if the valve is left closed, due to the well heating to static temperature, and due to the heat given off by the setting cement. If the cement head is closed during this time, pressure will build up, leading to the formation of a micro annulus when pressure is removed from the casing. It is recommended that this proposed subsection be removed.

Response:

Section has been reworded to account for wells using float shoe with latch down plug equipment to hold pressure on the cement for the entire 8 hr. WOC time.

Environmental Defense Fund comments:

We believe it is important that the DEP clarify the applicability and application of the 350 psi compressive strength standard. Is this a wait-on-cement standard that must be applied in addition to the eight-hour minimum? If 350 psi is the wait-on-cement standard, EDF strongly recommends increasing this compressive strength standard to 500 psi, consistent with New York, Ohio and Texas requirements.

In addition to the ASTM C-150 standard pertaining to chemical degradation and an early compressive strength standard, the DEP should consider adopting standards that address other aspects of cement quality, including ongoing compressive strength development (beyond the wait-on-cement minimum standard), shrinkage and free-water separation. For example, Texas standards state: "The cement mixture in the zone of critical cement shall have a 72-hour compressive strength of at least 1,200 psi...In addition to the minimum compressive strength of the cement, the API free water separation shall average no more than six milliliters per 250 milliliters of cement tested in accordance with the current API RP 10B."

Response

DEP believes not disturbing the casing is most important while the cement sets and the 350 psi compressive strength would be achieved or exceeded with either cement that meets the cement standard. Request further comment from TAB on 500 psi in 8 hours for ASTM vs API class spec meeting this requirement and additional testing for specifications as per API 10 (b).

David & Emily Krafjack comment;

There must to be a sort of DEP certification that the 8 hour cure period -- is adhered to

Response:

The department believes the entry of this information in the cement job log is sufficient for our inspectors to check and verify.

### **§ 78.86. Defective casing or cementing.**

Environmental Defense Fund comments:

Pennsylvania should broaden the operator's reporting obligation to include any aspect of defective construction. In addition to requiring an operator to report and repair defective casing, the department should require operators to report deficient cement, packers or any component of well construction that protects public safety and/or the environment. The regulations should establish reporting triggers, including detection of annular over-pressurization, circulation of stimulation fluids in the surface casing annulus during hydraulic fracturing operations and any other triggers deemed appropriate by the department. Upon detection of construction defects, the operator should notify the department within 24 hours and commence corrective action with an inspector present. If the defect cannot be corrected, the operator should plug and abandon the well using methods approved by the department. EDF would like to suggest the following language:

“No operator shall construct a well or allow defective casing or tubing in a well to leak fluids or gases that may cause damage to other permeable strata, fresh groundwater resources or the atmosphere or in a manner that threatens public safety. Upon the discovery that the construction is defective, the operator will notify the department within 24 hours of the discovery, and the owner will immediately correct the construction deficiencies in a manner approved by the department or plug and abandon the well.”

Response:

This section of the regulation had no changes, however, DEP believes the standards in the prior casing, cementing and subsequent mechanical integrity testing section changes accomplish the intent of the above comments.

### **78.88 Mechanical Integrity of Operating Wells**

Earth Justice and Sierra Club comment:

Revise § 78.88(a) to increase the operating well inspection frequency to daily, or at least weekly.

Response

The department believes the frequency proposed is reasonable and not overly burdensome for operators monitoring their wells.

PA Campaign for Clean Water comment:



Many eye-witnesses have shown that you can often find leaking well-heads. All you have to do to show it is pour a bit of water onto the base of the well-head and you can see bubbles coming out. How much of a leak will the Bureau define as too much? Who can report such a leak? What proof will they need to submit for DEP to come out and check the well-head? And what will be the consequence for leaving a leaking well behind?

We further believe that daily or at least weekly checks of wellheads are in order. We further believe that these inspections should be extended to project-wide pipelines, at least as long as they are actively delivering gas.

Response:

DEP believes the frequency proposed is reasonable and would make a determination on leakage from a well on a well specific basis based on the volume reported in (b)(3). DEP is also concerned with the safety of untrained individuals entering well sites unaccompanied. The department advises the public to stay away from active oil and gas operations.

Jesmar Energy comment:

General Comments: Stripper oil and gas wells should be grandfathered or exempt from these requirements and regulations. Older wells, especially wells that are 50-100 years old, have uncemented casing; their pressures are low and pose little threat to the fresh water supply. Any pollution would have occurred in previous years. These regulations would add a financial burden to small operators and great deal of clerical burden to the department.

Response:

DEP believes the frequency proposed is reasonable and old well casing is subject to deterioration and should be monitored by a prudent operator.

Chesapeake Energy comment:

The increase in inspections required by this proposed rule will increase costs significantly.

Response:

DEP believes a prudent operator would perform such monitoring to actually reduce their operating costs and the potentially enormous consequences of a well failing.

NFG comment:

§78.88(d)(2) Mechanical integrity of operating wells. The Proposed Regulations would set forth a hierarchy of corrective actions. One of these measures, in subsection (d)(2), requires the annular space surrounding the production casing to be open to the atmosphere. This requirement is ambiguous given that a cemented production casing cannot have an associated annular space open to the atmosphere. The PADEP should clarify this provision.

Response:

Whatever annular space remains after the production casing has been cemented to the surface (micro annular space resulting from channeling of the cement due to gas production) it should be open to atmosphere to preclude pressure build up.

Earth Justice and Sierra Club comment:

Revise §78.88 to require wells with mechanical integrity problems to be repaired, shut in, or plugged and abandoned, as appropriate and safe to protect human health and the environment. The annual mechanical integrity report required at § 78.88(e) should summarize both the compliance status of each well and what action was taken to remedy noncompliant wells.

Response:

DEP believes this is better addressed by 88(d) which requires immediate notice to DEP and immediate corrective action. We would like to know much quicker what action the operator has taken or is intending to take if not completed already.

Environmental Defense Fund comments:

The department should add language authorizing the director to require appropriate logs to evaluate primary cement quality and to affirm the quality of remedial cementing operations. The department should adopt performance standards for cement-evaluation logs that require the selection of logging tools that are capable of evaluating cement quality radially and of identifying the location of channels that could allow vertical migration of natural gas in the annulus.

Response:

DEP believes there are sufficient enforcement remedies to address such issues. The department does request copies of all logs run on the well.

Steckman Ridge comments:

New §78.88(e) calls for submission of annual reports identifying the compliance status of each well with the mechanical integrity requirements, using forms prescribed by the Department. One of the industry's concerns is the avoidance of "regulation by form" — where new or additional requirements are imposed through the promulgation of new forms of various types. The draft of the contemplated new form should be shared with and be available for review by the regulated community and the public so that all are aware of what is contemplated by this section.

Response:

The Department strives to maintain conformance with the regulations when it develops its forms. The content of any form developed by DEP can be commented on by the public at any time.

### **78.89 Stray] Gas [MIGRATION](#) [Mitigation] Response**

Environmental Justice and Sierra Club comment:

Revise the last sentence of § 78.89(b) to read: The operator, in conjunction with the Department and local emergency response agencies, shall immediately take measures to ensure public health, safety, and welfare. The requirements proposed at § 78.89(b) should be extended to oil and other chemicals.

Response:

It is NOT the intent of the Department to abrogate its responsibility to investigate and require remediation of gas migration issues. DEP believes the operator should also be directly involved

in the investigation. Other contaminants, although investigated by the DEP, have less of a safety hazard than explosive situations that can occur from gas migration and are handled as pollution incident investigations.

Emergency Response Staff comment:

This section is written in a way that places the burden of the initial response to an operator who is "aware" of the incident. I think it is very important that the Department does not abdicate its responsibility to protect public health and safety to an operator who may or may not be responsible for the stray gas migration, or who may have a different set of priorities. In addition, there may be multiple potential sources of a stray gas incident that are not O&G related. Stray gas incidents span the range of non-threatening to life threatening. The level of response should be relative to the threat. The incidents are also very dynamic and may require shifting strategies and rapid decision making. Ultimately, I think the Department needs to maintain control of the emergency phase, and the investigation, and work closely with the responsible party.

Dominion Transmission comments:

(b) When an operator or owner or the Department becomes aware of a stray natural gas incident that involves the operator's facility, or the operator the Department shall immediately notify the Department operator and conduct request 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 levels of natural gas determine potential sources of the natural gas. The operator, in conjunction with the department and local emergency response agencies, shall take measures necessary to ensure public health and safety. The operator, in conjunction with the Department, will assess and implement measures, as necessary, to ensure public health and safety.

Diane Ward comments:

Stray Gas Mitigation is not the goal. Did you mean Stray Gas Migration Response here? Stray Gas Prevention per my proposed 78.77 and the other proposed technical improvements proposed in this rulemaking are the ultimate fix. If stray gas occurs despite all of our best efforts, Stray Gas Elimination is the next best goal. The words Stray Gas Mitigation sound like a 3rd rate response to a serious life-threatening situation is the expectation. It would be better to name this section Stray Gas Response rather than the proposed Stray Gas Mitigation Response, since the response to a stray gas incident should focus on elimination first and mitigation only if elimination is not immediately possible.

Columbia Gas Transmission comments:

When the Department becomes aware of a stray natural gas incident that involves the operator's facility, the Department shall immediately notify the operator and request 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 determine potential sources of the natural gas. The operator, in conjunction with the Department, will assess and implement measures, as necessary, to ensure public health and safety.

Response:

DEP agrees in part and has changed some of the initial language and notification procedures.

Diane Ward comments:

Add - The operator shall also reimburse property owners and residents of the affected stray gas area for costs incurred by the property owners or residents during a recommended or required evacuation. This reimbursement should include, but not be limited to, the cost of temporary housing, per diem food costs, emergency clothing and other necessary supplies, and incremental transportation costs to jobs or schools. If an evacuation or area isolation via road closure requires that a place of business be shut down due to gas migration, reimbursement to business owners for lost profits and to business employees for lost wages should be provided.

Response:

DEP believes this is a civil liability issue between the parties and is better handled on a case by case basis by the local common pleas courts.

Environmental Defense Fund comment:

The 10% lower explosive limit standard does not reference a location. The DEP needs to specify whether it applies to indoor air measurements in the confined space of an inhabited structure, in a confined well-house, in the headspace of a water well or in some other location.

Response:

DEP solicits discussion from TAB as to LEL relating to any location with the idea being the location determines the response type.

Steckman Ridge comment:

(a) Triggering requirements: becoming "aware" of a "stray natural gas incident"?

The formulation mandating that an operator notify DEP upon becoming "aware of a stray natural gas incident" creates a vague and ill-defined mandate. The term "stray natural gas incident" is nowhere defined, either in terms of the nature of the condition, or its relationship to an operator's gas well. Some might conceivably claim that natural gas released to the atmosphere from a flare or from a compressor station is a "stray natural gas incident." Others might argue that if an operator in Westmoreland County somehow became aware (through rumor or otherwise) of an incident in Luzerne County, having nothing to do with the Westmoreland operator's well, it would nevertheless be compelled to report the same to the Department and then undertake an investigation.

At the same time, the reference to "awareness" raises an open question as to what gives rise to awareness of an incident. On one end of the spectrum, an operator might receive a complaint or other credible information of a potential incident through a written notice or call to an official at its offices. At the other end, what if some low level employee in the field (or at an off-time setting, such as a sports event) hears a rumor that someone was complaining about gas at an undefined location?

(b) Timing of Notification.

The use in §78.89(b) of the adjective "immediately" in a way that appears to apply to both "notify the Department" and "conduct an investigation" creates an unnecessarily stringent and almost impossible standard. The concept of what is "immediate" is not well defined, and under these circumstances could expose operators to "violations" while information is being passed from some field personnel to responsible officials who must judge whether an incident warranting reporting has occurred. While we would understand the urgency of quickly reporting a situation which poses a significant health and safety issue, many situations may be in a grey area. Indeed, whether a particular rumor or even a complaint relates to stray gas from a well, or from other conditions, is often not clear.

(c) A Possible Trigger Approach

We believe that the Department was probably intending to target these notice and investigation provisions to events where credible reports are received of stray natural gas in groundwater or in water supplies within the vicinity of an operator's well. Assuming that is the case, these provisions should be carefully cast to address this specific situation, and we would suggest the following:

The term "stray natural gas incident" should be defined as "a credible report or complaint that natural gas is present in groundwater within the potentially affected area of a natural gas well." Section 78.89 should be revised to provide that (i) an operator should report to the Department as expeditiously as possible, not to exceed twenty-four hours, after responsible managers receive credible information as to a stray natural gas incident occurring within the potentially affected area of a natural gas well which poses a threat to public health or safety; (ii) an operator should report to the Department within 72 hours after responsible managers receive credible information as to any other stray natural gas incident occurring within the potentially affected area of a natural gas well; and (iii) the operator would thereafter promptly initiate an investigation of such an incident.

The regulation needs to address the possible situation of what happens where two or more operators are working in the same area. How are these requirements to be applied or shared between operators?

(d) Nature of the Investigation

Proposed §78.89(d) refers to conducting a "field survey" and establishing "monitoring locations" but these concepts are not defined further or explained. What type of field survey is required, over what area, and using what techniques? What type of "monitoring" is to be conducted? These and related technical questions should be discussed with the Technical Advisory Board and should be illuminated in the regulation and preamble.

(e) Follow-up Reports

As suggested in prior comments, we believe the follow-up reporting requirements should differentiate between emergency situations (those presenting serious threats to health and safety) and other situations. In more serious situations, a report back to the Department within 24 hours would be appropriate. The regulation should allow for reporting by either telephone or by e-mail to a Department-designated e-mail reporting point.

(f) 501 Conference

We suggest adding a provision acknowledging the ability of an operator or the Department to request a conference under section 501 of the act (58 P. S. § 601.501) regarding the response to a stray gas incident.

NFG comment:

§78.89 In the case of storage wells, the PADEP's existing regulations (§78.402(d)) contain procedures to be followed in the case of gas leaks. The PADEP should therefore exclude storage wells from the scope of §78.89.

Response:

See the rewording of this section.

A 501 conference is always a possibility under the O&G Act and is not specific to this requirement.

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

Marcellus Shale Coalition comments:

§78.92 - Generally, the provisions modifying the plugging sections should be postponed until the department drafts a comprehensive revision to the plugging rules.

Response:

DEP will propose other requirements for construction and plugging other types of wells at a later date. Such operations are now typically done through alternate method approvals.

Walter Grube comment:

78.92 (1)--- "nonporous" and "completely seal the hole" should be quantified by specifications of water and/or gas permeability. The terms used in this draft are too qualitative and general. Also in 78.94 and 78.95. As written in this draft, the terms are probably those found in historic oil well drilling lingo, and have no real relevance to the potential for local groundwater contamination as has been already recently reported in some northern tier counties of Pennsylvania.

Response:

Nonporous is in the existing definitions and completely seal would require the plug to not allow fluid movement which is the objective.

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

TAB and Steckman Ridge comment:

78.122 (a)(10) The provision should be deleted because the operator must meet the well construction standards as part of the well permit and the signature of the operator on the well record already signifies that the well has been constructed properly. It is not clear from this language who is to sign this certification, whether the Department is envisioning a corporate officer certification, an engineer's certification, or something else. In terms of enforcing the standards in Ch. 78, we do not believe that an additional operator certification will be particularly helpful.

Response:

This is a condition of all permits being issued.

PCCW comment:

Finally, we believe the Bureau can and should require a list of additives used in slickwater fracking at sites. The bureau should further create rules or a fee schedule that creates disincentives to use constituents with low biodegradability, high bioaccumulation, high toxicity and mutagenic or reproductive affects, versus alternatives.

Response:

DEP agrees and has included a provision to identify all frac ingredients.

Range Resources comment:

At the present time, the report required by Section (a) and Section (b) are 1 report required for submission to the Department that covers all of the requested information. Based on the current industry practice with multi-well pads, the time period allowed for submission of this report to the Department is not always one that can be met by the operator. The Department should consider modifying the time period for submission of the report to one that is more manageable when several wells are drilled and completed on the same well pad.

Response:

The Well Record and Completion Report form is two reports on one page. See O&G Act Section 212 (b) second and third sentence. These activities do not happen concurrently, but in sequence that may be separated by a time period of less than one year. "A record of the well containing such information as required by regulation shall be filed with the department within 30 days of cessation of drilling. A completion report containing such additional information as required by regulation shall be filed with the department within 30 days after the completion of the well and it shall be kept on file by the department". Generally, the activities are completed within the same time frame. If the time frames are different, two different reports should be submitted.

TAB, Marcellus, Dominion Exp & Prod comment:

The information required by this provision §78.122(b)(6) is unnecessary and redundant. It is already required in other reports.

Response:

This is DEP's attempt to clarify that the descriptions typically provided on the completion report need to be more specific. This will also put the information in one place of the materials used to complete the well. DEP solicits TAB input on development of the well record and completion report form(s) to include the additional data which will detail required information.

Environmental Defense Fund comment:

§ 78.122: Well record and completion report

In addition to the information required under the proposed § 78.122, the DEP should also consider adding the following items:

A list of all wireline logs and the name of the logging contractor

Purpose for which the well was drilled or altered

Casing weight and grade (in addition to diameter)

Casing condition (new or used)

Depth and type of equipment attached to casing, including cement baskets, centralizers, packers, dv-tools, etc.

Casing pressure and blowout prevention equipment tests (date, duration, pressure and percent bleed-off)

Number and depth interval(s) of perforations

Type, volume, and concentration of acid

Date of acid stimulation

Type of well hydraulic fracture stimulation, e.g., slick-water, nitrogen foam, carbon dioxide foam

Date of hydraulic fracture stimulation

Name of the service company performing the stimulation

Fracture extension pressure and instantaneous shut-in pressure

Name and thickness of the principal confining intervals immediately above the interval or intervals stimulated

The DEP should also require the operator to provide more detailed records regarding well stimulation operations upon further request or as part of standard record submittal requirements.

These may include job invoices, pumping pressure and rate graphs, invoices, fracture maps or lists of fluid additives by unit volume.

Response:

See rewording of the requirements and clarification.