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The attached file contains 12 pages of comments along with sources to support my comments. Page 12 of this attachment includes a citations page.

I am a registered nurse and hold a bachelors of science degree, I am also a concerned citizen of this Commonwealth and welcome any future contact from the Department for any possible need for clarification of my attached document.

Please review all comments carefully and make appropriate decisions based on our environment and health.

I appreciate your time in reading my comments and appreciate the opportunity to make comments to the Department.

Thank You,

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Comments for Environmental Protection Performance Standards at Oil and Gas Well Sites

§ 78.15. Application requirements: Subsection(d): The well permit applicants should not be given permits where threatened or endangered species grow, live, or thrive. The oil and gas operators should have already been consulting with the Pennsylvania Natural Heritage Program as well as any other agency that regulates the protection of our ecosystem. Taking further and even more restricted steps to protecting our ecosystem is an absolute necessity as the violations that the operators are incurring have not been a rare occurrence in our State.

“The permit applicant, not the Department of Environmental Protection (DEP), should be responsible for determining whether proposed oil and gas operations would affect threatened or endangered species. (Section 78.15(d))

Protecting the habitat and physical safety of vulnerable species is a critical part of ensuring biodiversity and the quality of our environment. The federal Endangered Species Act was designed to achieve these goals by making it unlawful for any person to harass or take a listed species, including adversely affecting the habitat of a listed species in a manner that effects a take. Similarly, state law currently imposes the obligation on operators to ensure that their activities will not adversely affect listed species or their habitat.

The proposed regulations change that obligation by only requiring gas operators to mitigate the impact of their operations on threatened or endangered species if the DEP determines that the well site location will adversely impact species or “critical habitat.”

Because an operator proposing an oil or gas project stands to gain financially from the project, and is in the best position to understand the scope and potential impact of its proposal, the operator (and not the DEP) should have the burden of determining whether its project would affect listed species and their habitat. (8)”

“The definition of “seasonal high groundwater table” should be retained in the proposed regulations, because the term continues to play a key role in regulating oil and gas activities. (Section 78.1)

Proposed section 78.1 deletes the definition of “seasonal high groundwater table” even though that term is still used throughout the regulations, including in sections 78.56(a)(11), 78.59b(e). This definition should be maintained to ensure clarity and consistent enforcement. (8)”

“The DEP should respond to comments received about a permit that may affect an important public resource. (Section 78.15(d))

The proposed regulations allow for a public resource agency to receive notice of, and submit comments about, a proposed well permit that would affect its resources. The regulations, however, do not require the DEP to respond to those comments. To ensure that comments are adequately considered and that public resources are fully protected, the regulations should require the DEP to respond to comments submitted by public resource agencies. (8)”

§ 78.52a. Abandoned and orphaned well identification: The proposed requirements, contained in Subchapter C, which will require the following of gas and oil operators “(a) Prior to hydraulically fracturing the well, the operator of a gas well or horizontal oil well shall identify the location of orphaned or abandoned wells within 1,000 feet measured horizontally from the vertical well bore and 1,000 feet measured from the surface above the entire length of a horizontal well bore in accordance with subsection (b). Prior to hydraulically fracturing the well, the operator of a vertical oil well shall identify the location of orphaned or abandoned wells within 500 feet of the well bore in accordance with subsection (b). For the purposes of this section, a gas well is a well which is producing or capable of producing marketable quantities of gas or of gas and oil with a gas-oil ratio of more than 100 MCF per bbl of oil.”.

The gas and oil operators should be required to identify orphaned or abandoned wells at a distance in which they plan to drill horizontally. They should also take into account the depth of the orphaned or abandoned wells in terms of potential impact to the site specific geology from their proposed drilling in a horizontal direction. In addition to the oil and gas companies consulting with the Department’s database, farm line maps, and submitting a questionnaire to surface land owners, the PA DEP needs to investigate independent studies that can and have determined a safe distance from an abandoned and orphaned well to a new drill site. The research must include: pros and cons; health impacts, environmental impacts, complete and concise information pertaining to the risks to the specific geology in that area at the very least. If that research is unable to be obtained then the money from these proposed regulations must also assist with further research to obtain that data, otherwise, we’re being reactive rather than proactive.

§ 78.56. Temporary storage: In addition to the modular tanks receiving prior DEP approval, the tanks must be inspected, the oil and gas company must provide written documentation of date and time of last inspection as well as the name and signed signature of the mechanic inspecting such unit. The person who inspected the unit shall be held liable, as well as their employer, for any deficits to said storage units punishable under criminal law.

Further proposals under temporary storage are suggesting liner compatibility testing, liner seam testing, inspection requirements, notification to the Department prior to pit liner installation and a demonstration that the pit bottom is 20 inches above the seasonal high water table. In order to test liner compatibility, if we want true and transparent results, every single chemical used at that site must be known. Every single chemical going into that pit must have research data showing what reactions they will have with one another. If the gas and oil company counters with the argument that these chemicals are proprietary ingredients they shall not be granted any type of permit or allowance for a storage pit as this has great potential to cause harm to ground water, surface water, air quality, and human health. We can do things as long as they are legal, but also as long as they do not negatively impact anyone or anything else. If we choose to practice something that does have potential to harm, we face moral, ethical, and legal repercussions, as should these companies.

The proposals also state:

“[(4)] (8) A pit [or], tank or other approved storage structure that contains drill cuttings from below the casing seat, [pollutional] regulated substances[, wastes] or fluids other than tophole water, fresh water and uncontaminated drill cuttings shall be impermeable [and comply with the following:].”

“(iii) The liner shall be designed, constructed and maintained so that the physical and chemical characteristics of the liner are not adversely affected by the [waste] regulated substance stored therein and the liner is resistant to physical, chemical and other failure during transportation, handling, installation and use. Liner compatibility must satisfy ASTM Method D5747, Compatibility Test for Wastes and Membrane Liners, or other compatibility test approved by the Department for the duration the pit or other temporary storage structure is used.”

The EPA document titled “METHOD 9090A COMPATIBILITY TEST FOR WASTES AND MEMBRANE LINERS” supplies information and instructions for testing liners. Each well contains several different mixtures of known chemicals and chemicals which are regarded as proprietary ingredients. In order for the gas and oil companies to use these liners they must attest to the fact that each liner will indeed hold up to these regulations set forth by the EPA. If some of the chemicals are proprietary data and are unknown it would be interesting to see how the lawyers, whom submit information to and from the DEP to obtain permitting, can attest that all of the information in their packets are true and accurate. I propose that the PA DEP work with the EPA in investigating the validity of their statements as well as investigate whether there is information that these liners have been tested with multiple combinations of the chemicals they use and that the liners are specific to each and every well site. If the Department ends up choosing to continue to allow liner use in pits then I also propose that the thickness of these liners are increased as well as ensuring that the liners are individualized and specific to each site. It is also interesting to note that this particular EPA document has not been revised since 1992.

Comments pertaining to the seasonal high water table that is also noted under this section

Subchapter 3: “[iii] (11) The bottom of the pit shall be at least 20 inches above the seasonal high groundwater table, unless the operator obtains approval under subsection (b) for a pit that exists only during dry times of the year and is located above groundwater. The operator of an unconventional well shall determine that the pit bottom is at least 20 inches above the seasonal high groundwater table prior to using the pit. A soil scientist or other similarly trained person using accepted and documented scientific methods shall make the determination. The individual's determination must contain a statement certifying that the pit bottom is at least 20 inches above the seasonal high groundwater table according to observed field conditions. The name, qualifications and statement of the individual making the determination and the basis of the determination shall be provided to the Department upon request.”

In addition to giving this task to a trained professional, they must also research the specific soil of that terrain by accessing the soil maps at the court house for that location and also investigate other community resources that would be able to contribute to their research of that specific location such as a local conservation program. They must also document soil type, and soil characteristics such as drainage, permeability, potential for surface run off and potential changes during changing weather patterns. Once this data is collected and reviewed their information must be reviewed by the PA DEP, EPA (for possible future guideline data collection), and should also be submitted to the local court houses for record keeping purposes. Their process of data collection should be documented and reviewed to ensure a complete investigation occurred, this should also be public information as well as the name of the person and entity that reviewed their study also.

In regards to pits being 20 inches above the seasonal high water table, these pits should not be near the seasonal high water table. The potential chemicals in these pits pose risk to contaminating the seasonal high water table. One must also consider the fact that each region consists of different soil types which affect drainage, permeability, and run off. For example, Mercer County, Pennsylvania, consists of mainly 4 different soil types, “The Ravenna-Frenchtown association is the most extensive in the county, making up about 57 percent of the total landscape. It is a somewhat poorly drained to poorly drained soil. Its character leads to a high water table and restricted permeability which can limit its use. Next, is the Chenango-Braceville-Halsey association, which is well drained to poorly well drained. Its limitations include seasonal high water table, slowly or highly permeable, and drought. This association makes up approximately 20 percent of the county's soils. Third, is the Canfield-Ravenna association. It consists of moderately well drained and somewhat poorly drained soils. Its limitations include a slowly permeable subsoil and a seasonal high water table. This association covers nearly 17 percent of the county. Finally, is the Wayland, coarse variant-Papakating-Red Hook association which is very poorly drained to moderately well drained soils underlain by alluvium. Slow permeability, seasonal wetness, and likelihood of flooding are major limitations of these soils.(4)” When an operator advises the DEP that they have checked the location of the seasonal high water table they must submit proof of what materials were reviewed to determine this, along with copies of those materials. Prior to an operator receiving a permit for a pit, this information must be reviewed by an independent professional who specializes in geology and hydrogeology. Of course, the concerned Citizens of the State of Pennsylvania, including myself,

do not feel comfortable with pits that contain any type of chemical being anywhere near the ground especially when a “liner” is the only barrier. The seasonal high water table also fluctuates with weather changes and we do not have the capabilities to predict exactly what type of weather will affect us in the future. Meteorologists, and people who have interests in the land and farming, can hypothesize what the weather will be like in the coming year, but it is rarely if ever exact.

§ 78.57. Control, storage and disposal of production fluids.:

Please refer back to Pages 3-5 of these comments under “Temporary Storage” and comments pertaining to the “Seasonal High Water Table” as most, if not all, of the suggestions and considerations there also apply as to what comments should be made here.

§ 78.59b. Freshwater impoundments: As stated above, the impoundments and pits that contain any type of chemical should not be located anywhere near the high seasonal water table per the reasons listed above. Additional reasoning includes concern for plausible health impacts, “Although most additives are greatly diluted in the drilling process, organic compounds (with the exceptions of DBNPA and DBAN) tend to be lighter than water; therefore they float to the surface of holding pits, where they concentrate to essentially 100% of the surface. From there they volatilize or aerosolize into the air, from which they may be inhaled by neighbors and on-site industry workers. Partly for this reason, the states of Colorado (58) and New Mexico (59) have prohibited the use of impoundments for flowback fluids.”(1)

In addition to the impoundments, this article also advises proposed storing regulations to ensure mine influenced water in freshwater impoundments does not result in pollution to the water of the Commonwealth. This is simply another reason why the previous statements above need to be taken into high consideration. If there is the risk, the chance, the small possibility, that contaminated water and chemicals can pollute the waters of our Commonwealth then we need to simply figure out a way to completely avoid this process all together. If a multi-billion dollar company can figure out how to horizontally fracture the earth, at depths greater than 7,000 feet down and across, then we need for them to be accountable in developing responsible means for the waste that they create. They need to be responsible and accountable prior to any adverse events. This process is not for the state of Pennsylvania to create, they need to create alternative methods and then submit their proposals to the State and Federal government for review followed by independent research, followed by public hearings and approvals. The time frame could be unknown and vast, but the time frame of delivering water to the 300,000 residents of West Virginia recently was not quite known either.

§ 78.59c. Centralized impoundments.:

“The prohibition on construction of fluid storage areas within 100 feet of certain water bodies should be extended to all water bodies. (Section 78.59c)

The current draft regulations prohibit well operators from building “centralized impoundments” for wastewaters within 100 feet of any “solid blue line stream” identified by the United States Geological Survey. Solid blue line streams flow consistently year round. This 100 foot buffer is important, but it should be extended to other streams that do not flow continuously. Although we recognize that Act 13 unwisely referred to “solid blue line streams,” intermittent and ephemeral streams need to be protected as well. Some of our most vulnerable waters are intermittent portions of high quality streams. Those waters would not be adequately protected by these regulations. Furthermore, the DEP has an obligation to protect intermittent streams under the Clean Streams Law. Rather than attempt to make that decision on a case by case analysis, the DEP should extend this buffer to all Pennsylvania streams. (8)”

§ 78.60. Discharge requirements:

States that “The proposed amendments to this section specify that operators discharging tophole water by land application shall document compliance with the regulatory requirements, including those under the Dam Safety and Encroachments Act, make the records available to the Department upon request, and submit the relevant information in the well site restoration report.” This seems to be a reactive regulation rather than a proactive regulation. Per the Pennsylvania State University College of Agricultural Sciences, Cooperative Extension, School of Forest Resources, While top hole water is usually representative of groundwater used for local water wells and springs, the remaining water encountered during gas well drilling (bottom hole, stimulation and production fluids) may be contaminated with various water pollutants (3). Operators should not be permitted or allowed to discharge tophole water by land application as it poses a risk for contamination

If the Department does not reflect and agree with the above recommendation, the release of tophole water by land application should be greater than 500 feet from a water supply, stream, watercourse or body of water [or a wetland], and there should be no exceptions regardless of well location restrictions. The Department proposals of 100-200 feet from these locations are not as substantial as they should be when taking into account the possible risks involved as stated above.

§ 78.61. Disposal of drill cuttings: “(2) The drill cuttings are not contaminated with [pollutional material] a regulated substance, including brines, drilling muds, stimulation fluids, well servicing fluids, oil, production fluids or drilling fluids other than top-hole water, fresh water or gases. (3) The disposal area is not within 100 feet of a [stream, body of water or wetland] watercourse or body of water unless approved as part of a waiver granted by the Department under section [205(b) of the act (58 P. S. § 601.205(b))] 3215(b) of the act (relating to well location restrictions). (8) The surface of the backfilled pit area shall be revegetated to stabilize the soil surface and comply with § 78.53 (relating to erosion and [sedimentation] sediment control). The revegetation shall establish a diverse, effective, permanent, vegetative cover which is capable of self-regeneration and plant succession. Where vegetation would interfere with the intended use of the surface of the landowner, the surface shall be stabilized against erosion.”

These proposed regulations merit further clarification and further instructions to the oil and gas operators as well as the public. By definition, Drill Cuttings, “Lifted continually to surface during drilling by a circulating-fluid system driven by a pump. To facilitate removal of cuttings, mud is constantly circulated down through drill pipe, out through nozzles in drill bit, and then up to surface through space between drill pipe and well bore through earth (diameter of bit is somewhat greater than that of pipe). (5)” Further clarification is warranted to describe what measures, processes, and equipment is deemed adequate to separate the drilling fluid from the drill cuttings as well as the radionucleotides from the drill cuttings. The clarification should not be submitted by the oil and gas industry and instead be determined by independent researches including but not limited to: geologists, nuclear engineers, nuclear physicists, and biochemical engineers. The gas and oil industry shall pay the Commonwealth for the data obtained by these professionals.

Also, in addition to my above statement and/or if the Department chooses to ignore that request, the Agricultural Department must be notified as well as every lease holder and potential lease holder must be informed of research regarding the pros and cons of drill cuttings on land application. “Experiments conducted in France showed that after spreading oil-based mud cuttings on farmland, followed by plowing, tilling, and fertilizing, approximately 10% of the initial quantity of the oil remained in the soil. Phytotoxic effects on seed germination and sprouting were not observed, but corn and wheat crop yields decreased by 10% (6)” Potential concerns include the need for large land areas; the relatively slow degradation process (the rate of biodegradation is controlled by the inherent biodegradation properties of the waste constituents, soil temperature, soil-water content, and contact between the microorganisms and the wastes); and the need for analyses, tests, and demonstrations. Also, high concentrations of soluble salts or metals can limit the use of land spreading (6)” When evaluating land spreading as a drilling waste management option, several items should be considered. These include area-wide topographical and geological features; current and likely future activities around the disposal site; hydrogeologic data (location, size, and direction of flow for existing surface water bodies and fresh or useable aquifers); natural or existing drainage patterns; nearby environmentally sensitive features such as wetlands, urban areas, historical or archeological sites, and protected habitats; the presence of endangered species; and potential air quality impacts. In addition, historical rainfall distribution data should be reviewed to establish moisture requirements for land spreading and predict net evaporation rates. Devices needed to control water flow into, onto, or from facility systems should be identified. Wastes should be

characterized during the evaluation; drilling wastes with high levels of hydrocarbons and salts may not be appropriate for land spreading. (6)”

“Any disposal of waste materials at well sites should require that representative samples of the material be taken and analyzed and submitted to the agency to demonstrate that, for example, the drill cuttings are not contaminated, or that residual waste meets the regulatory standards. (Sections 78.61 and 78.62)

If waste is disposed at well sites, a sample of the material should be taken and analyzed. This sample should be sent to the agency to demonstrate that drill cuttings are not contaminated, and that any residual waste does not exceed legal limits. The regulations do not currently require that the operator use any scientific methodology to demonstrate compliance. (8)”

§ 78.62. Disposal of residual waste—pits. “(a) After the removal and disposal of the free liquid fraction of the waste under § 78.60(a) (relating to discharge requirements), the owner or operator may dispose of residual waste, **including contaminated drill cuttings**, in a pit at the well site if the owner or operator satisfies the following requirements”

Contaminated drill cuttings should not be disposed of on any land, nor near any type water supply. Please refer back to Pages 3-5 of these comments under “Temporary Storage” and comments pertaining to the “Seasonal High Water Table” as most, if not all, of the suggestions there also apply to what comments should be made here.

“The DEP should stop promoting the disposal of residual waste at well sites. (Section 78.62)

The draft regulations would allow well operators to dispose of residual waste in pits on well sites as long as they comply with certain minimal requirements. Because waste generated at oil and gas sites is exempt from the hazardous waste regulations, the result is that hazardous waste can be managed as residual waste and disposed at well sites with a single synthetic liner and no long-term groundwater monitoring. These minimal protections are inadequate.

As the DEP knows, many well-site disposal pits have leaked in recent years, contaminating surface and groundwater and dotting the Pennsylvania countryside with brownfield sites. Given the high risks of these mini-landfills, and the fact that their one and only advantage is fewer truck trips to landfills (and reduced cost for operators), the DEP should prohibit well site disposal of residual waste entirely. To the extent that the DEP continues to allow this method of waste disposal it should, at a minimum, require long-term groundwater monitoring and public notice of existing and future disposal sites.(8)”

§ 78.63. Disposal of residual waste—land application: Please refer to page 7 of these comments under the section for “Disposal of Drill Cuttings” for comments regarding land application.

“The collection and analysis of chemical samples of waste that the operator intends to dispose on site should not be discretionary; the regulations should be clear that is a mandatory obligation. This is particularly of concern where the disposal site does not need to be inspected by the agency prior to closure, and there is no long-term groundwater monitoring. (Section 78.63(19))

Collection and analysis of chemical waste samples that are intended to be disposed of onsite needs to be a mandatory requirement. The draft regulations leave this to the discretion of the operator, which should not be permitted. This is particularly important where a disposal site does not need to be inspected by the agency prior to closure, and there is no provision for long term monitoring of ground water. (8)”

“The DEP’s revisions to Chapter 78 should establish meaningful standards for the restoration of well sites and impoundment sites. (Sections 78.65, 78.59b, and 78.59c)

Act 13 requires two stages of restoration for well sites. On the one hand, section 3216(c) requires partial restoration after the conclusion of drilling and fracturing operations. On the other hand, section 3216(d) requires final restoration after the last well on the site has been plugged. The DEP is proposing to implement these sections in proposed regulation 78.65, which provides that a well site will be considered restored if it is returned to its “approximate original conditions, including preconstruction contours,” and if it “can support the original land uses to the extent practicable.” Similar language appears in the DEP’s proposed regulations for freshwater impoundments (78.59b) and centralized wastewater impoundments (78.59c), which also contain restoration requirements.

A return to original conditions, contours, and uses is a laudable goal for the restoration of well sites (both post-drilling and post-plugging) and impoundment sites. Currently, though, the DEP’s general restoration standards are practically unenforceable because the DEP’s regulations (i) fail to require environmental baseline site assessments, (ii) fail to require site-specific standards and criteria for restoration, (iii) fail to require environmental professionals to sign off on site restorations, and (iv) establish no process whereby the DEP can finally approve or disapprove restoration. The DEP should require site-specific baseline assessments and restoration plans for all well sites and impoundment sites, require professional certification that restoration goals have been met, and require DEP approval before a site can be considered to be restored.(8)”

§ 78.70. Road-spreading of brine for dust control and road stabilization.

And

§ 78.70a. Pre-wetting, anti-icing and de-icing:

The Commonwealth of Pennsylvania should not adopt any plans for spreading brine for dust control and road stabilization or for Pre-wetting, anti-icing, and de-icing. The spreading of brines on roadways, paved or unpaved, could allow for possible ground water and soil contamination as well as harmful impacts to human health. "Gas well brines are highly mineralized and contain levels of some pollutants that are far above levels considered safe for drinking water supplies.(2)" The Department's proposals that the Brine should not be spread within 150 feet of bodies of water and watercourses may not be a valid or reasonable distance as this is not taking site specific weather and soil types into account which could cause higher than estimated run off and contamination to unwanted areas. Also, the proposal that "(l) Every 3 years each source of brine used for pre-wetting, anti-icing and de-icing shall be analyzed for the parameters in subsection (e) prior to submittal of the plan required under subsection (a). The analysis shall be for each individual well utilized or it may be a composite of one or more samples of brines from wells, which produce gas from the same formation. The well permit number and producing formations shall be submitted with the analysis. If the brines used are obtained from a permitted brine treatment facility, the analysis of a representative composite sample shall be submitted along with the facility's National Pollutant Discharge Elimination System permit number." These statements allow for greater risk to occur as the increase in permits approved and wells drilled has multiplied exponentially in the areas of the Marcellus Shale Formation. A generalized statement that the brine could come from multiple wells should be changed and eliminated.

The spreading brine for dust control and road stabilization or for Pre-wetting, anti-icing, and de-icing proposal should be eliminated all together as the full and complete impacts on human health cannot be ascertained. Brine is known to contain high levels of radium. The decay of Radium occurs in seven known stages, one of them being Radon. According to the National Cancer Institute, "Radon is a radioactive gas released from the normal decay of the elements uranium, thorium, and radium in rocks and soil. It is an invisible, odorless, tasteless gas that seeps up through the ground and diffuses into the air. In a few areas, depending on local geology, radon dissolves into ground water and can be released into the air when the water is used.(6)" And according the American Cancer Society, Radon is the second leading cause of lung cancer in the United States (7).

Other health concerns from spreading brine include possibility of bacterial contamination. "Rock strata beneath the earth's surface are populated by bacteria, and the advent of air-lubricated drilling (without biocides) has introduced a risk of contaminating surface (fresh) water zones with bacteria and other microbes from deeper (brine) layers, where they often flourish. Of particular concern are sulfate-reducing bacteria, especially *Desulfovibrio desulfuricans*, an organism that thrives in fresh water where some sulfate (such as is present in pyrite or hematite) is available (50), (51). In fact, these bacteria are especially prevalent and aggressive in oil and gas producing regions, where they avidly form living black, sticky films in

water wells and other structures (52). There they produce hydrogen sulfide (H₂S), characterized by a “rotten eggs” smell. Rock strata rich in gas are often also rich in this bacterium, and exposure to hydrogen sulfide along with methane raises significant health concerns – neurological syndromes in humans and, in livestock, elevated birth defect rates and diminished herd health. At high concentrations, hydrogen sulfate is lethal (53). The now-common use of air-lubrication (without biocides) while drilling the top one- to three thousand feet of gas wells (54) risks contaminating fresh water aquifers with sulfate-reducing bacteria from the deeper strata, but there is no clear evidence that this well-fouling mechanism is recognized by Pennsylvania DEP regulators.”(1)

On a personal note, and as another example of how the spreading of brine can potentially impact the health of people who are not quite near the actual spreading of it:

My husband is a tractor trailer mechanic. During the winter months, when he is crawling on the ground and underneath these trucks, he becomes covered in a wet wintry slush. When the mechanics bring the trucks into the garage, or when a driver brings in a truck that same day to have work done, the ice and snow melt and drip from the trucks and into the garage due to the change in temperature. This in turn leads to the mechanics working on these trucks being covered and soaking wet with whatever was underneath or on that truck from their travels down the highway leading to the shop. This is particularly unnerving to me as most of these trucks drive through Ohio to get to their shop. Ohio already utilizes the spreading of brine on their highways without much if any regulation.

In addition to this personal story, and as a registered nurse, I am urging the Department to avoid any use of brine on the roadways of Pennsylvania. Failure to consult with the Pennsylvania department of health, the CDC, the NIH, or any other institutes of public health prior to authorization of this practice will be noted. Those who authorize such use will be held accountable in the court of law by the residents of this Commonwealth.

CITATIONS

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- 2.) Water Facts report #28, "Gas Well Drilling and Your Private Water Supply", College of Agricultural Sciences, Cooperative Extension, School of Forest Resources, (2008) <http://www.twcwc.com/GasDrillingAndPrivateWater.pdf>
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- 7.) American Cancer Society, "Radon, Does Radon Cause Lung Cancer", (2013),
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