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Mr. Jeffrey Fretwell  
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*VIA EMAIL AND U.S. MAIL*

**RE: Waterkeepers Chesapeake and Potomac Riverkeeper Network's Comments in  
Response to 43 Md. Reg. 1293 (Nov. 14, 2016)**

Dear Mr. Fretwell,

The Institute for Public Representation, on behalf of Waterkeepers Chesapeake and Potomac Riverkeeper Network (Environmental Groups), submits these comments urging the Maryland Department of the Environment (MDE) to prohibit fracking in the State.

Waterkeepers Chesapeake is a coalition of 19 independent programs working to protect the Chesapeake and Coastal Bays. Potomac Riverkeeper Network is comprised of three Riverkeepers working to protect the Potomac Watershed. The Institute for Public Representation (IPR) is a public interest law firm and clinical education program established at Georgetown University Law Center in 1971. Attorneys at IPR function as counsel for groups and individuals who are unable to obtain effective legal representation, including on matters involving the environment. IPR is representing Environmental Groups in this matter.

Because of the significant risks associated with fracking, Environmental Groups urge MDE to prohibit the practice in Maryland. Under state law, MDE has an obligation to protect

\* Admitted to the bars of New York and New Jersey. Supervised by a member of the DC bar.

public health and the environment. By adopting the proposed regulations despite increasing scientific evidence documenting the risk fracking presents to public health and the environment, MDE will fail to meet this legal obligation. Furthermore, MDE lacks the staff and resources to monitor an industry that has a history of violating similar laws in other states. Given the risks and MDE's lack of resources, the only responsible course of action is to prohibit fracking in Maryland.

This is the course of action favored by residents of Garrett County, where much of Maryland's fracking will occur. Garrett County voters support a statewide legislative ban on fracking two to one. It was also the course of action taken by the New York State Department of Environmental Conservation after it conducted one of the most exhaustive environmental and public health reviews of fracking to date. In the face of increasing knowledge of the risks, MDE should take the same course of action and prohibit fracking in Maryland.

However, given MDE's decision to move forward with revised fracking regulations, Environmental Groups have identified specific shortcomings in the regulations. The proposed regulations fall far below the "stringent and protective" standard MDE suggests they attain because these regulations include:

- o a Comprehensive Development Plan process stripped of necessary State oversight;
- o vague exceptions to requirements intended to protect public health and the environment;
- o well construction standards that will not prevent well leaks;
- o setbacks that are too small and that run counter to MDE's previous findings; and
- o provisions allowing for unsafe solid waste disposal in Maryland landfills.

Even if these regulations were stronger, the evidence from other states demonstrates that no amount of regulation is capable of preventing harm from fracking. Thus, the only way MDE can fulfill its legal obligation to keep its citizens safe and to protect the State's environment is to prohibit fracking in Maryland.

Sincerely,



Hope Babcock, Director  
Peter DeMarco, Staff Attorney  
Megan Cronin, Law Clerk  
Margie Robinson, Law Clerk

*On behalf of Waterkeepers Chesapeake and Potomac Riverkeeper Network*

**WATERKEEPERS CHESAPEAKE AND POTOMAC RIVERKEEPER NETWORK'S COMMENTS IN  
RESPONSE TO 43 MD. REG. 1293 (NOV. 14, 2016)**

**I. Waterkeepers Chesapeake and Potomac Riverkeeper Network Support a Prohibition on Fracking in Maryland**

Waterkeepers Chesapeake and Potomac Riverkeeper Network (Environmental Groups) urge the Maryland Department of the Environment (MDE) to prohibit horizontal hydraulic fracturing (fracking) in Maryland.<sup>1</sup> MDE's mission is "to protect and restore the environment for the health and well-being of all Marylanders."<sup>2</sup> Yet, despite the significant public health and environmental risks associated with fracking, MDE is poised to adopt regulations authorizing the practice. The adoption of these regulations in the face of the documented risks is unacceptable. It is made even more so because MDE lacks the resources to properly oversee an industry that has a history of violating similar laws in other states. Therefore, prohibiting fracking is the only way for MDE to meet its legal obligation to protect public health and the environment.

**A. MDE has a legal obligation to protect public health and the environment.**

State law requires MDE to protect public health and the environment. The Maryland Environmental Policy Act (MEPA) notes that "[t]he protection, preservation, and enhancement of the State's diverse environment is necessary for the maintenance of the public health and welfare and the continued viability of the economy of the State and is a matter of the highest public priority."<sup>3</sup> Furthermore, "[e]ach person has a fundamental and inalienable right to a healthful environment."<sup>4</sup> To these ends, MEPA directs State agencies to "conduct their affairs with an awareness that they are stewards of the air, land, water, living and historic resources, and that they have an obligation to protect the environment for the use and enjoyment of this and all future generations."<sup>5</sup> Accordingly, Maryland's Gas and Oil Title requires MDE to prohibit gas exploration and production "when these operations will have a significant adverse effect on the environment."<sup>6</sup>

As will be discussed in detail below, overwhelming scientific evidence shows that fracking in Maryland will have significant adverse effects on public health and the environment. Because of these harms, MDE should prohibit fracking in Maryland. Simply because the legislature directed MDE to adopt regulations that "provide for" fracking does not mean that MDE lacks the

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<sup>1</sup> Environmental Groups incorporate by reference all documents cited in these comments.

<sup>2</sup> See *About Us*, Md. Dep't of the Env't, <http://tinyurl.com/gpnr2wa> (last visited Dec. 6, 2016).

<sup>3</sup> Md. Code Ann., Nat. Res. § 1-302(b).

<sup>4</sup> *Id.* § 1-302(d).

<sup>5</sup> *Id.* § 1-302(c); see also *Bausch & Lomb Inc. v. Utica Mut. Ins. Co.*, 625 A.2d 1021, 1035 (Md. 1993) ("[MEPA] directs that State agencies must conduct their affairs as 'stewards of the air, land, [and] water . . . resources'; in common usage, a steward is one who cares for the property or interests of another.").

<sup>6</sup> Md. Code Ann., Envir. § 14-101. Furthermore, the likelihood that fracking will have an "adverse effect" on the environment without adequate state regulations is higher than comparable industry activities because important aspects of fracking are exempt from several federal pollution laws. See Renee L. Kosnick, Earthworks, *The Oil and Gas Industry's Exclusion and Exemptions to Major Environmental Statutes 2* (2007), available at <http://tinyurl.com/z9tl5ot>.

authority to prohibit fracking.<sup>7</sup> MEPA emphasizes that statutes are to be interpreted in a way that accords with State agencies' responsibility to act as stewards of the environment.<sup>8</sup> MDE should acknowledge what the scientific evidence shows and follow the legislature's directive to prohibit a process for gas extraction that will have "a significant adverse effect on the environment."<sup>9</sup>

## **B. Fracking will endanger Marylanders' health.**

The proposed regulations sanction fracking in the State despite firm scientific evidence of the adverse health effects associated with the practice.<sup>10</sup> A recent analysis of 685 peer-reviewed scientific articles published between 2009 and 2015 found that "the weight of the findings in the scientific literature indicates hazards and elevated risks to human health as well as possible adverse health outcomes" associated with fracking.<sup>11</sup> "84% of public health studies contain findings that indicate public health hazards, elevated risks, or adverse health outcomes; 69% of water quality studies contain findings that indicate potential, positive association, or actual incidence of water contamination; and 87% of air quality studies contain findings that indicate elevated air pollutant emissions and/or atmospheric concentrations."<sup>12</sup> Because the boom in high-volume slickwater fracking with horizontal drilling is a recent phenomenon, researchers are still playing catch-up. "By the end of 2015, over 80% of the peer reviewed scientific literature on shale and tight gas development has been published since January 1, 2013 and over 60% since January 1, 2014."<sup>13</sup> Indeed, since the Appalachian Laboratory of the University of Maryland Center for Environmental Science (UMCES) submitted its best management practices report to MDE in February 2013, numerous scientific studies have been published documenting the many adverse health effects associated with fracking.<sup>14</sup>

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<sup>7</sup> *Id.* § 14-107.1.

<sup>8</sup> Md. Code Ann., Nat. Res. § 1-302(c), (k).

<sup>9</sup> *See* Md. Code Ann., Envir. § 14-101; *Christ ex rel. Christ v. Md. Dep't of Nat. Res.*, 644 A.2d 34, 38-39 (Md. 1994) (holding that a statute directing the Department of Natural Resources to adopt regulations regarding the "operations of vessels" authorized the agency to prohibit the operation of vessels by children under a certain age).

<sup>10</sup> Indeed, the report the Maryland Institute for Applied Environmental Health prepared for MDE concluded that the risks for adverse public health effects were high or moderately high for every category of fracking-associated hazard except for earthquakes. Md. Inst. for Applied Env'tl. Health, Univ. Md., College Park, *Potential Public Health Impacts of Natural Gas Development and Production in the Marcellus Shale in Western Maryland* xx (2014), available at <http://tinyurl.com/j7d47d8>.

<sup>11</sup> Jake Hays & Seth B. C. Shonkoff, *Toward an Understanding of the Environmental and Public Health Impacts of Unconventional Natural Gas Development: A Categorical Assessment of the Peer-Reviewed Scientific Literature, 2009-2015*, 11 PLOS ONE 1 (2016), doi:10.1371/journal.pone.0154164. *See generally* Concerned Health Prof'ls of N.Y. & Physicians for Soc. Responsibility, *Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking (Unconventional Gas and Oil Extraction)* (4th ed. 2016), available at <http://tinyurl.com/zj86332> (compiling evidence of the harms and risks associated with fracking from scientific and medical literature, government reports, and journalistic investigation); *PSE Study Citation Database on Shale & Tight Gas Development*, PSE Health Energy, <http://tinyurl.com/gorbdft> (last visited Dec. 6, 2016) (compiling "a near exhaustive and evolving list of the peer-reviewed literature that directly pertains to shale and tight gas development" in an online database).

<sup>12</sup> Hays & Shonkoff, *supra* note 11, at 1.

<sup>13</sup> *Id.* at 2.

<sup>14</sup> *See, e.g.*, Elise G. Elliot et al., *Unconventional Oil & Gas Development and Risk of Childhood Leukemia: Assessing the Evidence*, 576 *Sci. Total Env't* (forthcoming 2017); Joan A. Casey et al., *Unconventional Natural Gas Development and Birth Outcomes in Pennsylvania, USA*, 27 *Epidemiology* 163 (2016); Sara G. Rasmussen et al., *Association Between Unconventional Natural Gas Development in the Marcellus Shale and Asthma Exacerbations*,

There are numerous ways that fracking operations can expose the public to pollutants and chemicals that could cause adverse health effects. Fracking pollutes the air at each stage of operation,<sup>15</sup> and fracking chemicals can contaminate groundwater and surface water,<sup>16</sup> including drinking water supplies. Moreover, a person need not live next to a well pad for fracking to harm their health: truck traffic and compressor stations, for instance, generate air and noise pollution. Thus, it is unsurprising that fracking is associated with a number of adverse health outcomes. Common health issues for people living near fracking sites include “fatigue, burning eyes, dermatologic irritation, headache, upper respiratory (difficulty breathing), gastrointestinal (severe abdominal pain), musculoskeletal (backache), neurologic (confusion, delirium), immunologic, sensory (smell and hearing), vascular, bone marrow (nosebleeds), endocrine, and urologic problems.”<sup>17</sup> In addition, fracking has been associated with increased hospital use.<sup>18</sup> It has also been “associated with increased odds of mild, moderate, and severe asthma exacerbations.”<sup>19</sup> And, another study found an association between fracking activities and preterm birth and physician-recorded high-risk pregnancies.<sup>20</sup>

Moreover, there is still much that is not understood about the health impacts of fracking. There are knowledge gaps with respect to the toxicity and carcinogenicity of many fracking chemicals.<sup>21</sup> Similarly, some health impacts are not fully understood because some of the

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176 JAMA Internal Med. 1334 (2016); Aaron W. Tustin et al., *Associations Between Unconventional Natural Gas Development and Nasal and Sinus, Migraine Headache, and Fatigue Symptoms in Pennsylvania*, *Envtl. Health Persp.* (2016), doi: 10.1289/EHP281; Joan A. Casey et al., *Predictors of Indoor Radon Concentrations in Pennsylvania 1989-2013*, 123 *Envtl. Health Persp.* 1130 (2015); Thomas Jemielita et al., *Unconventional Gas and Oil Drilling is Associated with Increased Hospital Utilization Rates*, 10 *PLOS ONE* (2015), doi:10.1371/journal.pone.0131093; Peter M. Rabinowitz et al., *Proximity to Natural Gas Wells and Reported Health Status: Results of a Household Survey in Washington County, Pennsylvania*, 123 *Envtl. Health Persp.* 21 (2015).

<sup>15</sup> Robert B. Jackson et al., *The Environmental Costs and Benefits of Fracking*, 39 *Ann. Rev. Env't & Resources* 327, 346 (2014).

<sup>16</sup> Md. Dep't of the Env't & Md. Dep't of Nat. Res., *Marcellus Shale Safe Drilling Initiative Study: Part III: Final Report Findings and Recommendations* 30 (2014), available at <http://tinyurl.com/zccdy5a> [hereinafter *MSSDI Report III*] (“Soil, groundwater and surface water could be contaminated by surface releases of fuel, additives, drilling mud, hydraulic fracturing fluid, flowback, produced water, or condensate. Some of the potential contaminants present health hazards if ingested or inhaled, or by dermal contact.”).

<sup>17</sup> Ruth McDermott et al., *Fracking, the Environment, and Health*, 113 *Env'ts & Health* 45, 45 (2013); see also Tustin et al., *supra* note 14, at 17-18 (determining fracking was associated with nasal and sinus, migraine headache, and fatigue symptoms); Rabinowitz et al., *supra* note 14, at 26 (concluding fracking operations “could be associated with increased reports of dermal and upper respiratory symptoms in nearby communities”).

<sup>18</sup> Jemielita et al., *supra* note 14, at 1.

<sup>19</sup> Rasmussen et al., *supra* note 14, at 1335.

<sup>20</sup> Casey et al., *supra* note 14, at 163.

<sup>21</sup> Elliot et al., *supra* note 14 (determining, in evaluating the carcinogenicity of chemicals and pollutants associated with fracking, that 91% of potential water contaminants and 80% of potential air pollutants had not been evaluated for their carcinogenicity by the International Agency for Research on Cancer); Erin E. Yost et al., *Overview of Chronic Oral Toxicity Values for Chemicals Present in Hydraulic Fracturing Fluids, Flowback, and Produced Waters*, 50 *Envtl. Sci. & Tech.* 4788, 4889, 4791 (2016) (finding that only 8% of 1076 chemicals reported in fracking fluids and 62% of 134 chemicals reported in flowback or produced water had available chronic oral reference values, “which estimate the amount of chemical that can be ingested daily by the human population . . . that is likely to be without appreciable risk of health effects over a lifetime,” or oral slope factors, “which are the upper bound on increased cancer risk from a lifetime oral exposure to a chemical”); William T. Stringfellow et al., *Physical, Chemical, and Biological Characteristics of Compounds Used in Hydraulic Fracturing*, 275 *J. Hazardous Materials* 37, 52 (2014) (“Importantly,

substances used “may have long-term health effects that are not immediately expressed.”<sup>22</sup> Therefore, given the health risks associated with fracking—both known and unknown—and MDE’s legal obligation to protect public health, MDE should follow the precautionary principle.<sup>23</sup> The only responsible action is to prohibit fracking, pursuant to Maryland’s Gas and Oil Title.

### **C. Fracking presents unacceptable risks to the environment.**

Fracking also threatens the natural systems upon which the lives and livelihoods of Marylanders depend. Surface water, for example, “could be contaminated by surface releases of fuel, additives, drilling mud, hydraulic fracturing fluid, flowback, produced water, or condensate.”<sup>24</sup> Spills that reach surface waters can kill or distress aquatic invertebrates and fish for miles downstream.<sup>25</sup> Moreover, to frack a single well requires millions of gallons of water.<sup>26</sup> Water withdrawals, particularly during droughts, can harm fish and other aquatic organisms.<sup>27</sup>

Casing and cement failures resulting from operator error, defective construction materials, and the corrosion of well parts can contaminate groundwater with methane from the formation and a host of toxic compounds used in fracking, such as benzene, xylenes, purgeable hydrocarbons, and gasoline and diesel by-products.<sup>28</sup> Well failures are not uncommon, considering 6.2% of the unconventional wells spudded in Pennsylvania between 2000 and 2012 failed.<sup>29</sup> Well failure rates increase over time because the materials used to construct wells deteriorate as they age,<sup>30</sup> especially if the wells have been improperly abandoned.<sup>31</sup> Groundwater contamination can also occur through faulty storage of wastewater, blowouts, accidents or leaks during truck transportation, and natural faults or fractures in the subsurface.<sup>32</sup> The risks associated with groundwater contamination from gas wells are significant, considering high levels of methane in household drinking water wells create a risk of explosions and asphyxiation.<sup>33</sup> Chemicals in

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there remains a significant gap in toxicity information, as no mammalian toxicity data was found for approximately one-third of the 81 chemicals examined.”).

<sup>22</sup> See Theo Colborn et al., *Natural Gas Operations from a Public Health Perspective*, 17 Hum. & Ecological Risk Assessment 1039, 1039 (2011) (finding, in a review of the health effects of 353 chemicals used in fracking, that the “results indicate that many chemicals used during the fracturing and drilling stages of gas operations may have long-term health effects that are not immediately expressed”).

<sup>23</sup> The precautionary principle is an ethical rule providing that, when an activity poses a risk to public health and the environment, protective action should be taken even in the absence of definitive scientific evidence establishing a causal connection between the harm and the activity. In other words, governments should not gamble with the health of citizens or the planet.

<sup>24</sup> *MSSDI Report III*, *supra* note 16, at 30.

<sup>25</sup> Diana Papoulais & Anthony Velasco, *Histopathological Analysis of Fish from Acorn Fork Creek, Kentucky, Exposed to Hydraulic Fracturing Fluid Releases*, 12 Se. Naturalist 92-93 (2013).

<sup>26</sup> Jackson et al., *supra* note 15, at 335.

<sup>27</sup> See Brian Buchanan et al., Presentation of *Environmental Flow Analysis: Marcellus Shale Region* 23:25, <http://tinyurl.com/z4mcfjy>.

<sup>28</sup> Jackson et al., *supra* note 15, at 337; *MSSDI Report III*, *supra* note 16, at 30.

<sup>29</sup> Anthony R. Ingraffea, *Assessment and Risk Analysis of Casing and Cement Impairment in Oil and Gas Wells in Pennsylvania, 2000–2012*, 111 PNAS 10955, 10956 (2014).

<sup>30</sup> *Id.*

<sup>31</sup> Jackson et al., *supra* note 15, at 338.

<sup>32</sup> See generally *id.*

<sup>33</sup> McDermott et al., *supra* note 17, at 48.

flowback and produced water also “present risks of neurotoxicity, reproductive problems, and cancer” when ingested by humans.<sup>34</sup> Marylanders are particularly vulnerable to harms from gas well leaks. Groundwater is the State’s most common drinking water source.<sup>35</sup> Moreover, karst geology and unconfined shallow aquifers in the western portion of the State make the drinking water sources of this region especially susceptible to pollution.<sup>36</sup>

Fracking also irrevocably alters entire landscapes. Well pads, roads, pipelines, and compressor stations convert forests and fields to industrial uses, fragmenting habitat and disrupting wildlife with noise and light pollution.<sup>37</sup> These impacts can actually shift the community composition of species in the surrounding area with “a trend of generalist species increasing and habitat specialists declining.”<sup>38</sup> For instance, preliminary results from a study investigating the impacts of fracking on Pennsylvania birds suggested “species that tend to be associated with people and anthropogenic edges, such as American robins (*Turdus migratorius*) and brown-headed cowbirds (*Molothrus ater*), are benefitting from development while forest specialists like black-throated green warblers (*Setophaga virens*) are losing habitat.”<sup>39</sup> The threat is as much economic as it is ecological. Western Maryland’s sustainable and growing tourism industry depends upon the region’s peaceful, scenic, and wildlife-abundant landscapes—qualities MDE proposes to sacrifice to the boom-and-bust economy of gas extraction. Fracking’s harms will also expand beyond Western Maryland. Access roads, truck traffic, pipelines, compressor stations, and power plants will adversely affect other regions of the State.

Finally, natural gas extracted in Maryland will exacerbate climate change. If it allows fracking, Maryland will be promoting fossil fuels instead of increasing investment in and support for clean renewable energy. Fracking also uses and emits harmful greenhouse gases, including methane.<sup>40</sup> As a coastal state, Maryland should be keenly aware of the disaster that awaits if sea level rise goes unchecked.<sup>41</sup> Rather than investing the State’s resources in regulating fracking—

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<sup>34</sup> *Id.*

<sup>35</sup> See *Maryland's Source Water Assessment Program*, Md. Dep’t of the Env’t (last visited Nov. 8, 2016), <http://tinyurl.com/jo3z7b9>.

<sup>36</sup> *Id.*; see Topper Sherwood, W. Md. Res. Conservation & Dev. Council, *A User’s Guide to Karst and Sinkholes in Western Maryland* 5 (2004), available at <http://tinyurl.com/zmv4bhx> (noting that Allegany County contains karst geology); Md. Dep’t of the Env’t & Md. Dep’t of Nat. Res., *Marcellus Shale Safe Drilling Initiative Study: Part II: Interim Final Best Practices* 21 (2014), available at <http://tinyurl.com/jloryml> [hereinafter *MSSDI Report II*]; Food & Water Watch, *Not So Fast, Natural Gas* 6-8 (2010), available at <http://tinyurl.com/ze3f8kp>.

<sup>37</sup> Margaret C. Brittingham et al., *Ecological Risks of Shale Oil and Gas Development to Wildlife, Aquatic Resources and Their Habitats*, 48 *Env’t. Sci. & Tech.* 11034, 11036 (2014) (noting that compressor stations are noisy and that wildlife may avoid noisy areas near compressor stations); see also Towson Univ., Reg’l Econ. Studies Inst., *Impact Analysis of the Marcellus Shale Safe Drilling Initiative* 93 (2014), available at <http://tinyurl.com/jm2jlp> (“The presence of compressor stations and truck traffic related to drilling increases noise and road usage.”).

<sup>38</sup> Brittingham et al., *supra* note 37, at 11036.

<sup>39</sup> Margaret C. Brittingham et al., *Shale Gas Development: Bringing Change to Pennsylvania Forests and Wildlife*, 8 *Wildlife Prof.* 22, 25 (2014).

<sup>40</sup> Robert W. Howarth, *A Bridge to Nowhere: Methane Emissions and the Greenhouse Gas Footprint of Natural Gas*, 2 *Energy Sci. & Engineering* 47, 47 (2014).

<sup>41</sup> See Tony Dutzik et al., *Env’t Am. Research & Policy Ctr.*, *The Costs of Fracking* 24 (2012), available at <http://tinyurl.com/h8oll2a> (estimating that methane emissions from the completion stage of each uncontrolled fracking well impose approximately \$139,000 in social costs related to global warming).

which will likely provide more economic benefit to out-of-state gas companies than to Maryland residents—Maryland should create jobs for its residents by investing in renewable energy.<sup>42</sup>

Fracking will harm Western Maryland’s air, water, land, and wildlife. These regulations also put natural resources throughout the State at risk because they allow for fracking in the entire State, including in regions overlying the Taylorsville Basin. The Basin underlies five counties in Maryland from just north of Annapolis to the Potomac River. Consequently, if MDE refuses to prohibit fracking, it is failing to fulfill its legal obligation to protect the environment.

#### **D. MDE will not be able to enforce the proposed regulations adequately.**

Even if Maryland could implement regulations that would provide the necessary level of protection to public health and the environment—which Environmental Groups do not think is possible—those regulations would only be effective if they are enforced. There is no doubt that operators will violate Maryland’s regulations. An analysis of oil and gas industry practices in Pennsylvania found “fracking companies violate rules and regulations meant to protect the environment and human health on virtually a daily basis.”<sup>43</sup> These violators include “large, multi-national oil and gas industry operators and smaller, locally owned firms—and companies that promised to exceed state safety standards.”<sup>44</sup>

The number of violations recorded in other states is staggering. One report, which investigated the violations of 68 of the country’s largest oil and gas companies between 2009 and 2013, found that 235 violations were recorded in Colorado, 364 were recorded in West Virginia, and 3,978 were recorded in Pennsylvania.<sup>45</sup> These numbers do not capture the total number of violations on the ground; many illegal acts are not classified as violations and many other illegal acts go undetected.<sup>46</sup> These illegal acts—whether identified and classified as violations or not—have a direct impact on public health and the environment. For instance, the Pennsylvania Department of Environmental Protection has identified more than 280 cases in which oil and gas activities have adversely affected private water supplies.<sup>47</sup> In addition, the Environmental Protection Agency (EPA) identified 457 instances of fracking-related spills in 11 states between January 2006 and April 2012, a third of which were attributable to human error.<sup>48</sup> In about two-thirds of the spills, spilled fluids reached at least one environmental receptor (surface water,

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<sup>42</sup> *Id.* at 30 (“A 2008 study found that Western counties that have relied on fossil fuel extraction are doing worse economically compared with peer communities and are less well prepared for growth in the future, due to a less-diversified economy, a less-educated workforce, and greater disparities in income.”).

<sup>43</sup> Jeff Inglis & John Rumpler, Env’t Am. Research & Policy Ctr., *Fracking Failures: Oil and Gas Industry Environmental Violations in Pennsylvania and What They Mean for the U.S.* 4 (2015), available at <http://tinyurl.com/hzhx4pa>; see generally Nat. Res. Def. Council, *Fracking’s Most Wanted: Lifting the Veil on Oil and Gas Company Spills and Violations* (2015), available at <http://tinyurl.com/htl3zcn>.

<sup>44</sup> Inglis & Rumpler, *supra* note 43, at 4.

<sup>45</sup> Nat. Res. Def. Council, *supra* note 43, at 7.

<sup>46</sup> *Id.* at 5.

<sup>47</sup> See Pa. Dep’t of Env’tl. Prot., *Water Supply Determination Letters* (last updated Nov. 9, 2016), available at <http://tinyurl.com/hmqwsgu>.

<sup>48</sup> U.S. Env’tl. Prot. Agency, *Review of State and Industry Spill Data: Characterization of Hydraulic Fracturing-Related Spills* 10, 16 (2015), available at <http://tinyurl.com/zdy3lun>.

groundwater, or soil).<sup>49</sup> There is no reason to believe similar violations will not also occur in Maryland: Chief Oil and Gas, a top ten violator in Pennsylvania, had obtained leases to drill in Garrett County before the fracking moratorium went into effect.<sup>50</sup>

Given the industry's history of violations and the harm that such violations can cause, MDE must supervise operators at every phase of the gas extraction process, which will require significant staff and resources. The regulations require operators to prepare stormwater management plans; invasive species management plans; sediment and erosion control plans; spill prevention, control, and countermeasure plans; and reclamation plans. If MDE does not thoroughly vet these plans and then monitor operators to ensure they are following them, the plans provide no protection. Similarly, the proposed regulations rely heavily on industry to self-report at many phases of the process including reporting the chemicals used in fracking, drilling activity logs (as required by the permit), results of integrity testing, methane emissions, and water quality monitoring. Yet, given the industry's history of violations, MDE will have to review operators' activities to ensure compliance. Several provisions, such as the requirements for well pad liners and secondary containment, will require onsite inspections, which, in turn, will require a significant number of State inspectors.

MDE, however, lacks the staff and resources to do the job it has created for itself. MDE admits that it does not even have the resources to carry out its existing duties.<sup>51</sup> Furthermore, MDE cannot effectively deter violations because civil penalties are capped at \$50,000 per violation.<sup>52</sup> MDE's attempts to address these inadequacies will not remedy them. The proposed regulations' new requirement that an operator can only drill and stimulate one well at a time does not address MDE's lack of staff and resources.<sup>53</sup> Even if an operator can only drill one well at a time, the agency will still be responsible for overseeing a portfolio of many other active permits in various stages of the regulatory process. Additionally, although MDE may also attempt to bridge its resource gap through assessing fines, fees, and penalties, the first fees will come too late. To enforce the regulations effectively, MDE needs staff and resources in place *before* it begins to accept drilling permit applications. Because MDE lacks the staff and resources to enforce fracking regulations, the most prudent action is to prohibit fracking in the State.

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<sup>49</sup> *Id.* at 19. This number may actually have been higher. Data about whether spilled fluids reached environmental receptors were not available for about ten percent of the spills. *See id.*

<sup>50</sup> Inglis & Rumpler, *supra* note 43, at 17; Darryl Fears, *Sitting Atop Huge Gas Reserve, Maryland Debates Drilling Practice Known as Fracking*, Wash. Post (Mar. 27, 2011), <http://tinyurl.com/jbyncqp>.

<sup>51</sup> Md. Dep't Env't, *Annual Enforcement and Compliance Report: Fiscal Year 2015 5*, available at <http://tinyurl.com/hfabz7d> ("Resource constraints continue to limit the Department's enforcement capabilities. . . . These constraints have also affected the legal resources available to MDE. The Office of the Attorney General continues to experience an enforcement backlog [of 84 cases] despite concerted efforts at backlog reduction through expedited case processing and modifications in MDE's enforcement approach.").

<sup>52</sup> *See* Md. Code Ann., Env'r. § 14-120; *MSSDI Report III*, *supra* note 16, at 89-90.

<sup>53</sup> 43 Md. Reg. 1293, 1306 (Nov. 14, 2016) (to be codified at Md. Code Regs. 26.19.24).

### **E. Despite fracking's harms to public health and the environment, MDE incorrectly states that fracking will benefit Marylanders.**

In the Estimate of Economic Impact, MDE asserts that, because its proposed regulations are more protective than existing regulations, the proposed regulations will provide an economic benefit to real estate professionals, tourism-related businesses, and the residents of Garrett and Allegany Counties.<sup>54</sup> But current State law *prohibits* fracking.<sup>55</sup> Adopting the regulations, then, will cause harm, not avoid it.

Fracking will decrease property values<sup>56</sup> and agricultural productivity,<sup>57</sup> harm natural resources crucial to the tourism industry,<sup>58</sup> and put workers' and residents' health at risk.<sup>59</sup> Groundwater and surface water contamination could increase treatment costs for public drinking water systems.<sup>60</sup> Remediating or replacing contaminated private drinking water wells is also extremely expensive.<sup>61</sup> Moreover, fracking dramatically increases truck traffic, and thus wear and tear, on local roads.<sup>62</sup> Despite MDE's earlier position that operators should be required to enter into agreements with local governments to restore roads the operators damage,<sup>63</sup> no such

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<sup>54</sup> 43 Md. Reg. 1293, 1294 (Nov. 14, 2016).

<sup>55</sup> Md. Code Ann., Envir., § 14-107.1 (establishing a moratorium on the issuance of fracking permits until October 1, 2017).

<sup>56</sup> Dutzik et al., *supra* note 41, at 30 (citing a 2010 study in Texas concluded that "houses valued at more than \$250,000 and within 1,000 feet of a well site saw their values decrease by 3 to 14 percent."). Fracking can also harm communities by creating a boom-and-bust cycle of economic development and higher crime rates. *See* Concerned Health Prof'ls of N.Y. & Physicians for Soc. Responsibility, *supra* note 11, at 176-91 (compiling examples of fracking's effects on local communities); Dutzik et al., *supra* note 41, at 30 ("A 2008 study found that Western counties that have relied on fossil fuel extraction are doing worse economically compared with peer communities and are less well prepared for growth in the future, due to a less-diversified economy, a less-educated workforce, and greater disparities in income.").

<sup>57</sup> Dutzik et al., *supra* note 41 at 3 (describing an 18.5% drop in milk production in the five Pennsylvania counties with the highest fracking intensity).

<sup>58</sup> It is estimated that more than 1.1 million people visit Garret County each year, leading to more than \$347 million in total economic impact and resulting in more than 5,000 jobs. Nicole Christian, *2009 Garrett County Tourism Market Survey Report and Economic Analysis* 14, available at <http://tinyurl.com/hdr7ksn>. Moreover, "[t]ourism sales tax revenues for [Garrett County] climbed more than 6 percent during the fiscal year that spanned July 2012 to June 2013, while tourism sales tax revenues for the state as a whole grew by less than 1 percent." Megan Brockett, *Tourism Rises in Garrett County, Deep Creek Lake Area*, Balt. Sun (Oct. 25, 2013, 5:24 PM), <http://tinyurl.com/hjxe8ev>.

<sup>59</sup> *See, e.g.*, Dutzik et al., *supra* note 41, at 19 (estimating that emissions of ozone precursors from gas operations in Arkansas' Fayetteville Shale imposed public health costs in excess of \$10 million in 2008); Nat'l Inst. for Occupational Safety & Health, *Hazard Alert: Worker Exposure to Silica during Hydraulic Fracturing*, Occupational Safety & Health Admin., <http://tinyurl.com/kela2ym> (last visited Dec. 5) (warning that workers at fracking sites may have an elevated risk of contracting silicosis caused by inhaling dust from the sand used in fracking).

<sup>60</sup> *See* Dutzik et al., *supra* note 41, at 14.

<sup>61</sup> *Id.* ("In Dimock, Pennsylvania, Cabot Oil & Gas reported having spent \$109,000 on systems to remove methane from well water for 14 local households."). The same company spent at least \$193,000 on replacement water for households in the same town. *Id.* at 2.

<sup>62</sup> In a report prepared for MDE by the Regional Economic Studies Institute at Towson University, researchers found that, under a 25% extraction scenario in Western Maryland, the average number of annual heavy-duty truck trips would increase by nearly 23,000 and the average number of light-duty truck trips would increase by nearly 8,000. When the scenario was adjusted for 75% extraction, the average annual number of heavy-duty truck trips would increase by nearly 68,000 trips and the average annual number of light-duty trips would increase by nearly 24,000. Towson Univ., Reg'l Econ. Studies Inst., *supra* note 37, at 99-100.

<sup>63</sup> *MSSDI Report III*, *supra* note 16, at 58.

requirement appears in the proposed regulations,<sup>64</sup> leaving local governments to foot the bill.<sup>65</sup> In suggesting the proposed regulations benefit Western Maryland, MDE glosses over these harms—harms that it is obligated by statute to consider.

Garrett County residents recognize these harms: voters in the County support a statewide fracking ban two to one (57% support a ban while only 27% oppose it).<sup>66</sup> The New York State Department of Environmental Conservation also recognizes these harms. When faced with the question now before MDE, it prohibited fracking in New York, determining there were “no feasible or prudent alternatives that would adequately avoid or minimize adverse environmental impacts and that address the scientific uncertainties and risks to public health from this activity.”<sup>67</sup> Indeed, the evidence from other states suggests that no amount of regulation is capable of preventing harm.<sup>68</sup>

Thus, in light of increasing scientific knowledge about the adverse public health and environmental impacts associated with fracking, the evidence of violations in the industry, and MDE’s inability to enforce these proposed regulations adequately, a prohibition on fracking in the State is the only way to protect public health and safety, the environment, and the natural resources that are crucial to Western Maryland’s tourism industry. Accordingly, to meet its legal obligation to protect public health and the environment, MDE should not adopt these—or any—regulations allowing for fracking in the State.

## **II. The proposed regulations do not protect Marylanders’ health or the State’s environment.**

Fracking cannot be done safely regardless of the regulations that MDE puts in place. However, given the State’s decision to move forward with revised fracking regulations, the comments below identify specific shortcomings in the regulations relating to planning and information dissemination, well construction, setbacks, and waste disposal. Our comments show that these regulations fall far below the “stringent and protective” standard MDE suggests they attain.<sup>69</sup> In many respects, they are weaker than the best management practices MDE itself said needed to be implemented for the risks from fracking to be managed to an acceptable level.<sup>70</sup> If

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<sup>64</sup> See Md. Code Regs. 26.19.33 § C (Proposed 2016) (providing road improvement only as one of several possible mechanisms that applicants *could use* to minimize the impact of truck trips).

<sup>65</sup> These costs can be significant. In 2010, Pennsylvania estimated it would need \$265 million to repair damaged roads in the Marcellus Shale region. Dutzik et al., *supra* note 41, at 3.

<sup>66</sup> Memorandum from Steve Raabe, President, Opinion Works to Chesapeake Climate Action Network 2 (Oct. 25, 2016), available at <http://tinyurl.com/hhwjtlk>. Support for a ban at the state level is similar: 56% of Maryland voters support a ban while only 28% oppose a ban. *Id.* at 1; see also Josh Hicks & Emily Guskin, *Marylanders Support Long Summers and Legal Marijuana*, Wash. Post (Oct. 7, 2016), <http://tinyurl.com/hn2af8s> (“In terms of fracking . . . 6 in 10 Marylanders oppose the practice in the state, more than twice as many as who support it (27 percent). Support for the practice . . . is down from 36 percent in a 2015 poll.”).

<sup>67</sup> N.Y. Dep’t Envtl. Conservation, *Final Supplemental Generic Environmental Impact Statement* 42 (2015), available at <http://tinyurl.com/or92gc4> (“The Department’s chosen alternative to prohibit high-volume hydraulic fracturing is the best alternative based on the balance between protection of the environment and public health and economic and social considerations.”).

<sup>68</sup> Concerned Health Prof’ls of N.Y. & Physicians for Soc. Responsibility, *supra* note 11, at 12.

<sup>69</sup> Scott Dance, *State Introduces Fracking Regulations, One Year Ahead of Ban’s End*, Balt. Sun (Sept. 27, 2016, 3:55 PM), <http://tinyurl.com/zcotprx>.

<sup>70</sup> *MSSDI Report III*, *supra* note 16, at 2, 100.

fracking proceeds under the proposed regulations, then, it will create an unacceptable risk to public health and the environment.

**A. The provisions of the regulations that relate to information and planning are insufficient to protect public health and the environment.**

The proposed regulations fail to put appropriate mechanisms in place to plan for the cumulative impacts of fracking, and they do not provide for adequate collection and dissemination of information. The Comprehensive Development Plan (CDP) process is much weaker than that proposed in the 2015 regulations and, as a result, is unlikely to mitigate the cumulative adverse effects of fracking. Similarly, the baseline monitoring requirements for groundwater and surface water, which have been weakened from the 2015 proposal, may fail to gather the information that will be necessary to mitigate harm effectively and efficiently, if a water source is contaminated. In addition, the chemical disclosure requirements, which allow industry to self-identify trade secrets and therefore withhold information from the public, fail to provide citizens with information necessary to protect their health and the environment. Finally, several provisions of the regulations do not provide sufficient information about how the provisions will be implemented, therefore, failing to satisfy the public’s environmental and health concerns.

- 1. MDE has stripped the Comprehensive Development Plan process—its only mechanism for addressing the cumulative impacts of fracking—of necessary State oversight.*

The cumulative impacts of fracking in the State are greater than the sum of the individual well pads’ impacts. Although a single well pad causes significant harms—in the form of water and air pollution, landscape conversion, and community disruption—multiple well pads cause profound cumulative impacts that must be planned for at the landscape level. MDE and the Department of Natural Resources (DNR) recognized the need to plan for cumulative impacts when they recommended that operators complete a CDP—that would be approved by MDE—before operators could apply for drilling permits.<sup>71</sup>

Yet, despite the early acknowledgment of these cumulative effects and the 2015 regulations’ initial recommendation for a robust CDP process, the current regulations provide for a toothless CDP process, one that lacks review and approval by the State.<sup>72</sup> While DNR (along with other relevant State and local agencies) can still comment on a draft CDP, the agency is no longer required to provide written advice to MDE regarding whether the CDP complies with setbacks and location restrictions and whether it avoids, minimizes, and mitigates adverse

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<sup>71</sup> See *MSSDI Report II*, *supra* note 36 (“Proactive, upfront planning at a landscape scale provides the framework for evaluating and minimizing cumulative impacts to the environmental, social and economic fabric of western Maryland.”); *see also* Md. Code Reg. 26.19.12 (Proposed 2015).

<sup>72</sup> Compare 43 Md. Reg. 1293, 1301-02 (Nov. 14, 2016) (to be codified at Md. Code Regs. 26.19.13) with 42 Md. Reg. 94, 104-05 (Jan. 9, 2015) (to be codified at Md. Code Regs. 26.19.12).

impacts.<sup>73</sup> In addition, the 2016 proposed regulations remove the requirement that MDE approve or disapprove the CDP after receiving that written advice from DNR.<sup>74</sup>

Furthermore, unlike the 2015 regulations, the 2016 regulations do not require DNR to convene a stakeholders group—including a representative of the operator, appropriate State agencies, local government, resource managers, NGOs, and surface owners—to discuss how the CDP could be improved.<sup>75</sup> Instead, the 2016 regulations rely solely on a public comment process overseen by the operator and merely require that the operator “accept and consider” any public comments it receives.<sup>76</sup> The operator need not act on or even respond to any of these comments.<sup>77</sup>

By eliminating important steps in the CDP development process, the 2016 regulations rely too heavily on industry to ensure that public comments are appropriately considered and that the CDP provides its intended protections. In the absence of DNR convening a stakeholder group and with no requirement that MDE review and approve a CDP, it will be all too easy for operators to ignore public comments, including those from State and local agencies. Without State oversight, there is also no mechanism to hold operators accountable for sub-standard CDPs. The result is that CDPs are less likely to mitigate cumulative adverse effects. Indeed, the Chair of the Marcellus Shale Safe Drilling Initiative (MSSDI) Advisory Commission, in comments responding to MDE’s 2016 Issue Papers, noted that eliminating a separate requirement for approval of the CDP would “significantly weaken the Department’s ability to assure that development is done in a way that minimizes risks.”<sup>78</sup> Furthermore, the Advisory Commission Chair observed, “[l]imiting the approval step to the individual well pad strips a layer of protection that most on the Commission determined was absolutely necessary.”<sup>79</sup>

MDE’s justifications for these changes are insufficient. MDE eliminated State oversight “so that obtaining a CDP is not unduly burdensome to the applicant.”<sup>80</sup> Requiring MDE’s approval

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<sup>73</sup> See Md. Code Regs. 26.19.13 (Proposed 2016).

<sup>74</sup> See *id.*; see also Md. Dept. of the Env’t, *COMAR 29.16.01 Oil and Gas Resources: Issue Papers for Stakeholder Input – June 2016* 13 (2016), available at <http://tinyurl.com/ho4weqz> [hereinafter *Issue Papers*] (“In the current proposal [which has been adopted in the 2016 proposed regulations], there would be no separate approval of a CDP, nor would DNR be tasked with evaluating whether the CDP avoids, minimizes, and mitigates adverse impacts. For the new proposal, [MDE’s] permit review would ultimately determine whether and under what conditions each well can be constructed and operated in a manner protective of public health, the environment, and surrounding populations.”).

<sup>75</sup> Compare Md. Code Regs. 26.19.13 (Proposed 2016) with Md. Code Regs. 26.19.12 (Proposed 2015).

<sup>76</sup> Md. Code Regs. 26.19.13 § F(1) (Proposed 2016).

<sup>77</sup> *Id.* §§ F, G.

<sup>78</sup> Letter from David A. Vanko, Dean, The Jess & Mildred Fisher College of Science & Mathematics, Towson University to Maryland Department of the Environment (July 18, 2016) (on file with MDE).

<sup>79</sup> *Id.*

<sup>80</sup> *Issue Papers*, *supra* note 74, at 12-13. However, the very report on which the Issue Papers rely to support the argument that the CDP process should not be “unduly burdensome to the applicant,” *id.* at 13, was the report in which MDE initially outlined its conceptual framework for a robust CDP process. *MSSDI Report II*, *supra* note 36, at 10-14. That conceptual framework included steps that are eliminated by the 2016 regulations, including the formation of a stakeholders group and the requirement that the CDP be approved by the State. See *id.* This suggests that MDE’s initial position was that these requirements were not overly burdensome for applicants but rather were necessary steps to ensure the CDP process effectively achieved its goals of promoting responsible energy development while minimizing adverse effects.

of CDPs is a burden on the agency, not the applicant. Moreover, if operators are going to extract the State's natural gas—through a process that poses significant risks to the environment and public health—MDE should require operators to do all that is necessary to ensure they are minimizing those risks. Indeed, meaningful State oversight would only be *unduly* burdensome if it were unnecessary. It is not unnecessary. It is the only way to ensure operators take the CDP process seriously, to make certain operators consider public comments, and to require operators to plan for fracking activities in a way that minimizes cumulative impacts. MDE additionally justifies the changes by stating that it will make an assessment of the potential for adverse effects on a permit-by-permit basis.<sup>81</sup> However, MDE previously acknowledged this “piece-meal” approach is insufficient.<sup>82</sup> MDE simply cannot address the cumulative impacts from multiple wells through its review of individual permits.

MDE's new CDP process works well for operators, who can now avoid rigorous review of the cumulative impacts to public health and the environment from their long-term drilling plans. Yet, it will be detrimental to the communities that will face the increased adverse health and environmental effects resulting from poor planning.

2. *MDE fails to explain adequately its decision to reduce surface water and groundwater baseline monitoring from two years to one year.*

As discussed above, the process of fracking natural gas provides multiple pathways through which groundwater and surface water can become contaminated.<sup>83</sup> Rigorous baseline monitoring is required to reduce response time in the event of contamination and to reduce the extent of contamination.<sup>84</sup> Moreover, multiple years of baseline monitoring of groundwater and surface water are necessary to account for variability in these water resources from year to year.<sup>85</sup> In fact, in the second MSSDI report, DNR concluded that “a minimum of 2 years of pre-development baseline data is necessary to evaluate the condition and characteristics of aquatic resources.”<sup>86</sup>

Despite the need for multiple years of baseline monitoring, the proposed regulations reduce the requirements for baseline data collection from two years to one,<sup>87</sup> seemingly in response to

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<sup>81</sup> *Issue Papers*, *supra* note 74, at 13.

<sup>82</sup> *MSSDI Report III*, *supra* note 16, at 54 (“[T]he [CDP] provides an opportunity for landscape level planning for a company’s entire planned operations over a five year period that gives State reviewers, the public and the applicant a means to minimize cumulative impacts to natural resources, as well as address community and public health concerns comprehensively, rather than on a piece-meal basis.”); *see also MSSDI Report II*, *supra* note 36, at 11 (“Proactive, upfront planning at a landscape scale provides the framework for evaluating and minimizing cumulative impacts to the environmental, social and economic fabric of western Maryland.”).

<sup>83</sup> *See MSSDI Report III*, *supra* note 16, at 30.

<sup>84</sup> *Id.* at 55; *see also MSSDI Report II*, *supra* note 36, at 50 (“Characterization and baseline monitoring data will be important to identify whether any impacts to the resources have occurred as a result of drilling activities, and can be used as basis for mitigating damage.”).

<sup>85</sup> *MSSDI Report II*, *supra* note 36, at C-101 (“For groundwater and especially for surface water, the year-to-year variability can be large.”).

<sup>86</sup> *Id.* at 50; *see also id.* at C-77, C-101 (responding to comments critical of the two-year baseline monitoring requirements and explaining why they are necessary).

<sup>87</sup> *Compare* Md. Code Regs. 26.19.19 (Proposed 2016) *with* Md. Code Regs. 26.19.17 (Proposed 2015).

pressure from industry.<sup>88</sup> MDE fails to provide adequate justification for these changes, especially in light of the evidence of year-to-year variability. The shortened monitoring period is premised on the fact that MDE has collected water quality data from 12 sites in Garrett County while the statewide moratorium has been in place.<sup>89</sup> However, MDE fails to identify the pollutants sampled or how it determined that the 12 sites are representative of regional surface water quality.<sup>90</sup> Similarly, MDE points to a volunteer-driven program that will supplement the State's monitoring by collecting data on 70 additional streams.<sup>91</sup> Yet, again, MDE provides no information about the pollutants being sampled nor does MDE give any indication that this volunteer-driven program will consistently and correctly collect the necessary data.<sup>92</sup> Without more detail on the baseline conditions of the waterways and the parameters being sampled by the State, it is not possible to determine whether the background monitoring provides sufficient data to support a reduced baseline monitoring requirement. Furthermore, the *surface water* monitoring conducted at the sample sites cannot justify weakening *groundwater* monitoring requirements.

In addition, MDE suggests that these reduced monitoring requirements are more in line with the requirements of other states.<sup>93</sup> However, relying on other states' regulations is only useful if MDE has demonstrated those states' requirements are grounded in independent and rigorous scientific analysis. MDE has not shown that the regulations in other states are grounded in the necessary scientific analysis, thus rendering these state comparisons irrelevant and potentially misleading to Maryland residents who are trying to discern how protective the proposed regulations will actually be. MDE, therefore, has failed to explain adequately its decision to shorten the baseline water quality monitoring period, and this reduced monitoring may be insufficient to allow MDE to respond effectively and efficiently if water sources become contaminated.

3. *The proposed chemical disclosure requirements are overly accommodating of operators' trade secret claims and, as a result, important information about the chemicals used in fracking may be withheld from the public.*

The chemicals used in fracking present many risks to public health.<sup>94</sup> Because of these risks, industry should not be permitted to designate chemical formulas as trade secrets. If

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<sup>88</sup> See *Issue Papers*, *supra* note 74, at 18 (“During the comment period on the 2015 proposal, [MDE] received comments stating that the 2-year monitoring period prior to submission of a permit application would produce unnecessary and excessive delay and discourage gas development.”)

<sup>89</sup> *Id.*

<sup>90</sup> *Id.*

<sup>91</sup> *Id.*

<sup>92</sup> *Id.*

<sup>93</sup> *Id.*

<sup>94</sup> Elliot et al., *supra* note 14 (identifying, in an analysis of chemicals found in hydraulic fracturing fluids or wastewater and potential air pollutants, 55 possible, probable, and known carcinogens, including 20 with some evidence of increased risk of leukemia or lymphoma or both); Colborn et al., *supra* note 22, at 1039 (“A list of 944 products containing 632 chemicals used during natural gas operations was compiled. Literature searches were conducted to determine potential health effects of the 353 chemicals identified by Chemical Abstract Service (CAS) numbers. More than 75% of the chemicals could affect the skin, eyes, and other sensory organs, and the respiratory and gastrointestinal systems. Approximately 40-50% could affect the brain/nervous system, immune and cardiovascular systems, and the kidneys; 37% could affect the endocrine system; and 25% could cause cancer and mutations.”).

Maryland is going to allow for fracking in the State, the process should be fully transparent, and the public should have access to information regarding the concentrations of the chemicals used. However, if MDE maintains the trade secret exemption for chemical formulas, the proposed regulations are insufficient because operators are allowed to shield information about their chemicals from disclosure without having to provide any evidence to substantiate their trade secret claims.<sup>95</sup> Unlike Maryland, three states and the federal government require or will require industry to substantiate trade secret claims of fracking chemicals.<sup>96</sup> By failing to require industry to support its trade secret assertions, it will be too easy for industry to abuse this designation, allowing drillers to withhold vital information from the public.<sup>97</sup>

Moreover, public health professionals should not be required to sign nondisclosure agreements to receive trade secret information. For many of the chemicals used in fracking, little is known about them, and additional research is needed to understand their impacts on human health and the environment.<sup>98</sup> Requiring public health professionals to sign a nondisclosure agreement may stymie this necessary research. It is also imperative that the results of public health research regarding the effects of fracking be available to both the scientific community and the general public. Yet, unlike the MSSDI best practices report and the final MSSDI report,<sup>99</sup> these regulations fail to make it clear that public health professionals may publish the results of their research so long as they do not include any trade secret information. The regulations' stipulation that public health professionals may share the information as "professionally necessary" is ambiguous.<sup>100</sup> Fear of the legal ramifications resulting from this ambiguity may prevent some researchers from publishing their findings.

The regulations also overlook the importance of chemical disclosure for avoiding and remediating environmental harms. A study that reviewed 353 chemicals used during natural gas operations concluded that 40% of the chemicals have been found to have adverse ecological effects, "indicating that they can harm aquatic and other wildlife."<sup>101</sup> Information on the concentration of chemicals in fracking fluids, which operators can withhold as trade secrets, could be crucial to responding to the ecological harms from a spill or well leak. Yet, environmental

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<sup>95</sup> See Matthew McFeeley, Nat. Res. Def. Council, *State Hydraulic Fracturing Disclosure Rules and Enforcement: A Comparison* 6 (2012), available at <http://tinyurl.com/hb62wad> ("To ensure that trade secret claims are legitimate, companies should be made to provide specific factual justification which demonstrates that they are entitled to prevent public disclosure of the information.").

<sup>96</sup> See 43 C.F.R. § 3162.3-3(i)(1), (j); 178-00-001 Ark. Code R. § B-19(1)(8); 4 Va. Admin. Code § 25-150-365(C) (not yet available on commercial databases but available at <http://tinyurl.com/gvvfjpu>); 055-000-003 Wyo. Code R. § 45(f).

<sup>97</sup> In addition, although the window of time an operator has to provide MDE with the list of chemicals it used in fracking has been shortened from that proposed in the 2015 regulations, the new timeframe is still unnecessarily long. See Md. Code Regs. 26.19.31 § B (Proposed 2016). Allowing operators 10 days to disclose these harmful chemicals demonstrates that MDE's focus is on reducing the burden on industry and not where it should be—on ensuring that the public has timely and easy access to information that could have a very real impact on its health.

<sup>98</sup> See Elliot et al., *supra* note 14 (determining, in evaluating the carcinogenicity of chemicals and pollutants associated with fracking, that 91% of potential water contaminants and 80% of potential air pollutants had not been evaluated for their carcinogenicity by the International Agency for Research on Cancer); Stringfellow et al., *supra* note 21, at 52 ("Importantly, there remains a significant gap in toxicity information, as no mammalian toxicity data was found for approximately one-third of the 81 chemicals examined.").

<sup>99</sup> See *MSSDI Report III*, *supra* note 16, at 46; *MSSDI Report II*, *supra* note 36, at 34.

<sup>100</sup> Md. Code Regs. 26.19.31 § J(3) (Proposed 2016).

<sup>101</sup> Colborn et al., *supra* note 22, at 1046.

organizations have no mechanism for gaining access to vital trade secret information under these regulations. The chemical disclosure requirements, then, fail to provide the public with a mechanism for obtaining necessary information.

4. *Provisions of the regulations do not provide sufficient details to satisfy the health and environmental concerns of the public.*

Several provisions of the proposed regulations fail to provide sufficient information about protocols that will be used to implement the regulations and, as a result, the public cannot assess whether these protocols will be sufficiently protective of the environment. In addition, the regulations include several vaguely worded exceptions that could undermine important protections.

a. Information Gaps in Protocols and Procedures

MDE neglects to specify the protocols and testing procedures necessary to implement several provisions of these regulations. For example, the regulations permit operators to dispose of drill cuttings on site if they “meet all criteria established by the Department, including sulfates and salinity,” and do not show radioactivity above background levels.<sup>102</sup> However, MDE has not identified sulfate or salinity thresholds or testing procedures.<sup>103</sup> Furthermore, the regulations fail to provide the protocols MDE will require operators to follow when conducting baseline and ongoing water quality monitoring.<sup>104</sup> Without access to on-site disposal and water quality monitoring protocols, the public is not able to evaluate whether these regulations protect groundwater and surface water. Nor can the public provide feedback to MDE about whether the protocols employ appropriate methods and require the collection of appropriate data—both before fracking begins and after it has started.<sup>105</sup>

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<sup>102</sup> Md. Code Regs. 26.19.54 § H (Proposed 2016).

<sup>103</sup> *Id.*

<sup>104</sup> Md. Code Regs. 26.19.19, 26.19.51 (Proposed 2016). The only specific guidance provided by the proposed regulations with respect to the baseline monitoring protocols is that monitoring protocols must include “sampling of each private drinking well located within 2,500 feet from a vertical wellbore” except when the owner of the well denies permission to sample. Md. Code Regs. 26.19.19 § D (Proposed 2016). MDE does not provide factual support or the methodology used to determine that the 2,500-foot impact area will be large enough to capture all the water supplies that could be at risk from a single wellhead. Because a study found wells within one kilometer of drilling sites were more likely to be contaminated with gas than those farther away, MDE could extend the zone for baseline monitoring of private drinking wells beyond 2,500 feet. See Robert B. Jackson et al., *Increased Stray Gas Abundance in a Subset of Drinking Wells Near Marcellus Shale Gas Extraction*, 110 PNAS 11250, 11251 (2013). Although Maryland law creates a presumptive impact area of 2,500 feet, Md. Code Ann., Env. § 14-110.1, this reflects a legislative judgment about which parties should bear the burden of proving causation after harm has occurred. Baseline monitoring protocols, on the other hand, are meant to help prevent harm from occurring. MDE should design baseline monitoring protocols based on the best available science, rather than statutory presumption. See also Beizhan Yan. et al., *Association of Groundwater Constituents with Topography and Distance to Unconventional Gas Wells in NE Pennsylvania*, Science of the Total Environment (in press) 1, 1 (2016), available at <http://tinyurl.com/h34tuso> (finding that fracking-related contaminants discovered in valley groundwater near fracked wells indicate that further impact on groundwater quality over time is possible and that rigorous baseline monitoring is necessary to understand fracking’s impact on groundwater).

<sup>105</sup> This is particularly problematic because neither DNR nor the Department of Health and Mental Hygiene are involved in the development of these protocols, which means those agencies’ areas of focus—natural resources and

## b. Vague Exceptions

MDE has also failed to explain how it will exercise its discretion when considering exceptions to several of its regulatory requirements. For example, the regulations require operators to recycle 90% of wastewater only when it is “practicable,” but MDE has not defined the term or explained how it will evaluate operators’ recycling exemption claims.<sup>106</sup> Meanwhile, industry claims that recycling 90% of wastewater from Maryland’s Marcellus Shale wells will rarely be practicable.<sup>107</sup> If MDE exempts operators from the recycling requirements on a frequent basis, then those requirements will not reduce the pressure on Western Maryland’s waterways from fracking-related water withdrawals.<sup>108</sup>

In addition, the proposed regulations remove the blanket ban on locating well pads on land with steep slopes greater than 15%.<sup>109</sup> Although MDE may reject a site location if it “determines that additional measures would not be adequately protective,” the regulations provide no guidance on what MDE will deem “adequately protective.”<sup>110</sup> Furthermore, MDE has provided no justification for lifting the prohibition except that it allows for a “more flexible approach.”<sup>111</sup> Similarly, the regulations provide an exception to the distance that access roads must be set back from streams, nontidal wetlands, and floodplains when there is “no feasible design to maintain the [required] setbacks.”<sup>112</sup> Without more guidance on what constitutes a feasible design, the exception could swallow the rule. MDE could have designed these regulations in a way that preserves the agency’s case-by-case discretion while still being transparent about its decision-making criteria. Its failure to do so adds to the other flaws in the regulations’ information and planning provisions.

## **B. The well casing regulations do not protect public health and the environment.**

MDE touts its fracking regulations as being the most “stringent and protective” in the country,<sup>113</sup> but its well casing standards mimic practices used in Pennsylvania that have not prevented well leaks. Furthermore, neither well construction nor well integrity standards prevent dangerous blowout events.

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public health—may not be appropriately considered in the development of the protocols. *See* Md. Code Regs. 26.19.19, 26.19.51, 26.19.54 (Proposed 2016).

<sup>106</sup> *MSSDI Report III*, *supra* note 16, at 48. Furthermore, Environmental Groups will have limited avenues to ensure that operators are recycling their wastes properly considering the proposed regulations do not require operators to report the volumes of recycled water used in operations.

<sup>107</sup> Letter from Erik Milito, Director of the American Petroleum Institute, to Maryland Department of the Environment, 3 (July 18, 2016) (on file with MDE). Maryland’s limitations on the number of wells that a single operator can drill at one time may further complicate wastewater recycling in Maryland. *See* Md. Code Regs. 26.19.24 (Proposed 2016).

<sup>108</sup> *See* Keith Eschelman & Andrew Elmore, Univ. of Md. Ctr. for Env’tl. Sci., *Recommended Best Mgmt. Practices for Marcellus Shale Gas Dev. in Md.*, 4-15, 4-16 (2014).

<sup>109</sup> *Compare* Md. Code Regs. 26.19.20 (Proposed 2016) *with* Md. Code Regs. 26.19.18 (Proposed 2015).

<sup>110</sup> Md. Code Regs. 26.19.20 § F (Proposed 2016).

<sup>111</sup> *Issue Papers*, *supra* note 74, at 25.

<sup>112</sup> Md. Code Regs. 26.19.20 § I(3) (Proposed 2016).

<sup>113</sup> *Dance*, *supra* note 69.

1. *Maryland's well casing regulations are deficient because they reflect standard industry practices that fail to protect groundwater.*

MDE touts the safety of its well casing regulations because it is the first state to require five well casings; however, five well casings will not prevent leaks. In Pennsylvania, regulations require four layers of casing, and industry claims to generally use five layers.<sup>114</sup> Nevertheless, 6.2% of the unconventional wells spudded in Pennsylvania between 2000 and 2012 failed.<sup>115</sup> In northeastern Pennsylvania, over 9% of unconventional wells drilled between 2002 and 2012 experienced integrity failures.<sup>116</sup> Five layers of casing have not prevented significant well integrity failures in Pennsylvania, and they will not prevent them in Maryland.

2. *Well blowouts threaten the health, safety, and environmental resources of Marylanders.*

Blowouts are rare, but even one blowout can cause enormous and irrevocable damage.<sup>117</sup> These explosions, which generate extreme heat and eject drilling fluids, cuttings, muds, and wastewater at high pressure, can injure and kill workers, threaten the health and safety of individuals nearby, and pollute the environment.<sup>118</sup> For example, in June 2010, an explosion at a Moundsville, West Virginia Marcellus Shale well sent seven people to the hospital burn unit and forced authorities to close a local highway.<sup>119</sup> That same month, a blowout at a well in Clearfield County, Pennsylvania “spewed gas and drilling fluid 75 feet into the air, requiring closure of roads and a no-fly zone over the area.”<sup>120</sup> In February 2014, three gas wells exploded in Dunkard Township, Pennsylvania, killing one gas well worker and injuring another.<sup>121</sup> The fire burned for five days, and well control was not regained until two weeks after the explosion.<sup>122</sup> The well posed such a safety threat that authorities established a half-mile safety perimeter around the well pad.<sup>123</sup> Regulations cannot eliminate the risk of blowouts.

**C. The location restrictions and setbacks in the proposed regulations are insufficient to protect public health and the environment.**

Many of the risks associated with fracking are poorly understood, meaning there is not sufficient evidence to determine whether setbacks and location restrictions provide their intended protections. Moreover, in spite of the increasing evidence of the risks associated with fracking, MDE has weakened setback requirements, and it has proposed setbacks that run counter to its own

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<sup>114</sup> Marcellus Coalition, *An Educational Message from the Pennsylvania Oil & Gas Industry* 7, available at <http://tinyurl.com/j86aapd>.

<sup>115</sup> Ingraffea, *supra* note 29, at 10956.

<sup>116</sup> *Id.*

<sup>117</sup> Jackson et al., *supra* note 15, at 338.

<sup>118</sup> Marsha Haley et al., *Adequacy of Current State Setbacks for Directional High-Volume Hydraulic Fracturing in the Marcellus, Barnett, and Niobrara Shale Plays*, 124 *Env'tl. Health Persp.* 1323, 1327-8 (2016).

<sup>119</sup> *Id.* at 1326.

<sup>120</sup> *Id.* (citations omitted).

<sup>121</sup> *Id.*

<sup>122</sup> *Id.*

<sup>123</sup> *Id.*

findings. As a result, the location restrictions and setbacks in the proposed regulations are insufficient to protect public health and the environment.

*1. There is not sufficient evidence to determine whether setbacks and location restrictions provide their intended protections.*

As discussed above, fracking is an inherently dangerous practice that involves the use of chemicals and other pollutants that have adverse impacts not only on human health, but also on the environment. Setbacks and location restrictions are proposed as mechanisms for reducing these risks. Yet, there is little empirical evidence on how large setbacks must be to provide sufficient protection to the environment and public health and safety.<sup>124</sup> The fact that researchers continue to uncover new evidence of health harms from fracking suggests that regulators in other states have overestimated the efficacy of setbacks for protecting public health.

Indeed, fracking impacts may extend well beyond the setbacks in the proposed regulations. For example, as a result of blowouts, evacuations of homes in half-mile, a mile, and even two-mile radii from drilling operations have been required.<sup>125</sup> Additionally, the Maryland Institute for Applied Environmental Health (MIAEH) health study recommended that unconventional natural gas development and production facilities be set back 2,000 feet from residential property to minimize exposure to air pollutants.<sup>126</sup> Moreover, a study of drinking water wells in northeastern Pennsylvania found that wells within one kilometer of drilling sites were more likely to be contaminated with gas than those farther away.<sup>127</sup> The proposed setbacks, then, may prove insufficient to protect against the harms associated with fracking. This is especially problematic because owners of property beyond the proposed setbacks may not know they need to take steps to protect themselves from these harms. The regulations only require that landowners within 1,000 feet of a proposed well be notified when a drilling permit has been granted.<sup>128</sup> As a result, those who own land farther away—in many instances outside of the proposed setbacks—may be unaware they are living near a fracking well and may not take appropriate steps to protect themselves, such as testing their water supplies for contamination.<sup>129</sup>

Furthermore, MDE itself implicitly recognizes that the harms of fracking may extend beyond its proposed setbacks. By establishing location restrictions that prohibit operators from locating well pads within particular reservoirs' watersheds,<sup>130</sup> MDE suggests that fracking activities present a real risk of contamination to these watersheds—one that setbacks are insufficient to protect. Yet, MDE continues to rely on setbacks to minimize harm in the portions of the watersheds downstream of the reservoirs, even though MDE's approach to reservoirs implicitly acknowledges these setbacks are inferior. Contamination from fracking could have

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<sup>124</sup> *Id.* at 1323.

<sup>125</sup> *Id.* at 1326 (citations omitted).

<sup>126</sup> Md. Inst. for Applied Env'tl. Health, Univ. Md., College Park, *supra* note 10, at 40.

<sup>127</sup> Jackson et al., *supra* note 104, at 11251.

<sup>128</sup> Md. Code Regs. 26.19.17 (Proposed 2016).

<sup>129</sup> Although operators are required to notify landowners within 2,640 feet that they are submitting an application for a permit, Md. Code Regs. 26.19.14 (Proposed 2016), the State should take steps to ensure that impacted landowners are kept informed throughout the application process, including by providing all impacted landowners with notice of the grant of a drilling permit.

<sup>130</sup> Md. Code Regs. 26.19.20 (Proposed 2016).

significant impacts on the aquatic habitat and recreational activities, such as fishing, in the downstream portions of streams. Setbacks, then, cannot ensure that these resources—or public health and the environment more generally—are sufficiently protected from the harms created by fracking operations.

What is more, the blanket ban on locating well pads in certain reservoirs' watersheds may itself be insufficient to protect these watersheds. Because horizontal drilling can extend for more than a mile from the vertical well bore, a wellhead located outside of these reservoir watersheds at the surface would be allowed to drill horizontally into the watershed area. Because MDE's proposed regulations do not prohibit or restrict shallow fracking,<sup>131</sup> which presents an increased risk of contamination to groundwater,<sup>132</sup> this deficiency could put drinking water supplies in these reservoirs at risk.

There is much uncertainty, then, about the effectiveness of setbacks and location restrictions. This is made even more concerning because MDE may lack the tools to assess whether the restrictions it has created are providing their intended protections. As discussed above, the proposed regulations' baseline water quality monitoring requirements are inadequate. This is particularly troublesome with respect to the 2,000 foot setback from surface water intakes of public water supplies.<sup>133</sup> There is a dearth of studies that consider surface water setbacks, so it is not clear this setback will be protective enough of these important sources of drinking water. And, without a sound understanding of the existing conditions of the State's surface waters, it will be impossible to assess whether this—and other setbacks and location restrictions relating to water resources—are providing necessary protections.

2. *Even in the face of increasing evidence of the risks associated with fracking, MDE has weakened setbacks and has proposed setbacks that run counter to its previous findings.*

Although setbacks' efficacy at preventing harm to public health and the environment is unclear, it is beyond question that the setbacks the State requires must be properly designed if they are intended to mitigate any of fracking's harmful effects. Yet, MDE has reduced setbacks without sufficient justification and proposed setbacks that run counter to its previous findings, specifically with respect to the setbacks from private wells, aquatic habitats, and caves. In addition, MDE weakens the 2016 regulations by narrowing the area from which setbacks apply; rather than applying the setbacks to a well pad's supporting infrastructure, many setbacks now apply only to the limit of disturbance for the well pad.

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<sup>131</sup> The regulations failed to take up the recommendation in the final MSSDI report that “[n]o oil or gas well with lateral drilling and hydraulic fracturing shall be permitted unless there is a separation of at least 2,000 vertical feet between the deepest fresh water aquifer and the target formation.” *MSSDI Report III*, *supra* note 16, at 100.

<sup>132</sup> See Robert B. Jackson et al., *The Depth of Hydraulic Fracturing and Accompanying Water Use Across the United States*, 49 *Env'tl. Sci. & Tech.* 8969, 8975 (2015). In addition, a recent study found an association between increased contaminants in valley groundwater and proximity to fracking wells, which the authors suggest may be attributed to increased mixing of shallow and deep groundwater. Yan et al., *supra* note 104, at 2, 6-7. Although the exact mechanisms for contamination are not known, this study highlights the significant gaps in our understanding of how fracking activities impacts groundwater quality.

<sup>133</sup> Md. Code Regs. 26.19.20 (Proposed 2016).

### a. Private Wells

The proposed setback from private wells puts private well owners at unacceptable risk for contamination of their drinking water supplies. Indeed, MDE and DNR concluded that a larger setback of one kilometer (3,280 feet) would better protect private well owners.<sup>134</sup> In assessing the risk of methane contamination of drinking wells, MDE and DNR determined that the risk of casing and cement failures “probably will not be eliminated” and, correspondingly, evaluated the risk of groundwater contamination from such failures using two different setback distances—2,000 feet and one kilometer.<sup>135</sup> The more protective setback reduced the risk of contamination from moderate to low.<sup>136</sup> Although MDE’s recommendation of a 2,000 foot setback makes clear that the agency is comfortable subjecting private well owners to a moderate risk of methane contamination, many affected well owners—some of whom have not agreed to allow fracking on their own properties—find this level of risk unacceptable.

### b. Aquatic Habitats

The proposed setbacks from streams and wetlands fail to protect other important aquatic habitats and aquatic and terrestrial wildlife. Whereas the 2015 regulations required fracking well setbacks from “all streams, rivers, seeps, springs, wetlands, lakes, ponds, water reservoirs, and 100 year floodplains,”<sup>137</sup> the 2016 regulations only require setbacks from streams and wetlands.<sup>138</sup> As a result, the proposed regulations fail to protect important aquatic habitats, such as lakes and ponds.

In addition, for those aquatic habitats that are protected, MDE proposes to reduce the setbacks from fracking wells from 450 feet to a range of 100 to 300 feet.<sup>139</sup> This reduction runs counter to MDE and DNR’s previous conclusions that a larger setback is necessary to protect aquatic and terrestrial wildlife. In fact, MDE and DNR conducted a supplemental literature review to support their decision to increase setback distances from 300 feet—as recommended in the UMCES report—to 450 feet.<sup>140</sup> Although the Departments concluded the 300 foot setback would protect water quality, they recommended the more protective setback to “provide a higher level of protection for biodiversity (with a focus on aquatic biodiversity), ensure sufficient corridor width needed for terrestrial wildlife movement and forest interior-dwelling bird species, and reduce the visual, noise, and light impacts of gas extraction operations in close proximity to aquatic habitats.”<sup>141</sup> That MDE is willing to weaken this setback given its past findings is troubling in its

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<sup>134</sup> See Md. Dep’t of the Env’t & Md. Dep’t of Nat. Res., *Assessment of Risks from Unconventional Gas Well Development in the Marcellus Shale of Western Maryland*, Appendix H 9 (2015), available at <http://tinyurl.com/zub8hsb>.

<sup>135</sup> *Id.*

<sup>136</sup> *Id.*

<sup>137</sup> Md. Code Regs. 26.19.01 § B(5), 26.19.18 (Proposed 2015).

<sup>138</sup> Md. Code Regs. 26.19.20 (Proposed 2016).

<sup>139</sup> Compare Md. Code Regs. 26.19.20 (Proposed 2016) with Md. Code Regs. 26.19.18 (Proposed 2015).

<sup>140</sup> *MSSDI Report II*, *supra* note 36, at 20 (“The Departments propose the following modifications and additions [to the UMCES report] that were based on the subject matter expertise of the agencies. . . . The setback distance from aquatic habitat (defined as all streams, rivers, seeps, springs, wetlands, lakes, ponds, reservoirs, and 100 year floodplains) has been expanded to 450 feet.”)

<sup>141</sup> *Id.* at H-2.

own right, but, because Garrett County has such a wealth of natural resources and biodiversity, it is especially concerning that MDE is willing to put these resources at risk.<sup>142</sup>

MDE suggests that the new setbacks are more in line with those in other states.<sup>143</sup> This is only relevant, however, if the setbacks in other states are sufficient to prevent harm. MDE makes no such showing that other states' setback requirements are sufficiently protective.<sup>144</sup> MDE also points to existing regulatory programs (wetlands and waterways permitting program and sediment and erosion control plans) to justify the changes.<sup>145</sup> While the wetlands and waterways permitting program and sediment and erosion control might protect water quality and aquatic species, they will not insulate wildlife from the visual, noise, and light impacts associated with fracking nor will they provide a sufficient corridor for terrestrial wildlife. The proposed setbacks, then, have been unjustifiably reduced and will fail to protect both aquatic and terrestrial wildlife sufficiently.

### c. Caves

The setback from caves is reduced from 1,000 feet to 750 feet.<sup>146</sup> Yet, this runs counter to MDE and DNR's conclusions in the second MSSDI report, where the Departments determined a 1,000 foot setback was necessary "because of the biological resource sensitivity and the potential for groundwater contamination."<sup>147</sup> In explaining the change, MDE says that its primary concerns with impacts to caves are "from surface spills and from difficulties of cementing if an underground void is encountered."<sup>148</sup> MDE indicates that surface spills are addressed with "the requirements for the well pad and storage of liquids on site."<sup>149</sup> However, redundant protections are necessary given the risks associated with fracking.<sup>150</sup> As a result, shorter setbacks cannot be justified simply because other protections are in place.

MDE goes on to explain that it "believes setbacks are necessary to ensure underground voids are avoided."<sup>151</sup> Yet, it provides no explanation as to why these voids will be avoided if the setback from caves is reduced to 750 feet.<sup>152</sup> MDE's reduction of the setback from caves, therefore, is unjustified and is insufficient to protect the environment.

### d. Areas from Which Setbacks Apply

Many of the setbacks in the 2016 regulations apply from "any land within the limit of disturbance for the well pad."<sup>153</sup> In the 2015 regulations, the setback distances also applied from

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<sup>142</sup> See *MSSDI Report III*, *supra* note 16, at 52-53.

<sup>143</sup> *Issue Papers*, *supra* note 74, at 23-24.

<sup>144</sup> See *id.*

<sup>145</sup> See *id.* at 24.

<sup>146</sup> Compare Md. Code Regs. 26.19.20 (Proposed 2016) with Md. Code Regs. 26.19.18 (Proposed 2015).

<sup>147</sup> *MSSDI Report II*, *supra* note 36, at 21.

<sup>148</sup> *Issue Papers*, *supra* note 74, at 25.

<sup>149</sup> *Id.*

<sup>150</sup> See Haley et al., *supra* note 118, at 1330 ("A combination of a reasonable setback with accompanying controls on all aspects of the process is the best method for reducing the potential threats to public health.").

<sup>151</sup> *Issue Papers*, *supra* note 74, at 25.

<sup>152</sup> *Id.*

<sup>153</sup> Md. Code Regs. 26.19.20 § E (Proposed 2016).

“any other gas development activities that result in the permanent surface alteration, including permanent roads, compressor stations, separator facilities, and other permanent infrastructure.”<sup>154</sup> Except for a provision that provides access road setbacks from certain water resources, the 2016 regulations no longer require any setbacks from this supporting infrastructure.

MDE primarily justifies this change by suggesting that local erosion and sediment control planning, zoning, and land restrictions will address the impacts of this infrastructure.<sup>155</sup> Yet, MDE also notes that “most areas of Garrett County are currently unzoned.”<sup>156</sup> MDE fails to explain how this lack of zoning will be addressed in Garrett County, which along with Allegany County will be ground zero for fracking in Maryland. This lack of zoning is problematic, for example, because compressor stations are noisy and are likely to disrupt wildlife and people living nearby.<sup>157</sup> Especially given the limited zoning in Garrett County, these regulations are insufficient to address these concerns.

Although the regulations do require that access roads not be located within 100 feet of a stream or 25 feet of a nontidal wetland or floodplain,<sup>158</sup> it is not clear that these setbacks are sufficiently protective. Construction and use of these access roads can have an adverse impact on water quality and aquatic species.<sup>159</sup> Yet, even in the face of these risks, MDE does not explain why its proposed access road setbacks from wetlands, floodplains, and streams are sufficient to prevent these harms.<sup>160</sup> By reducing the location from which setbacks apply, the proposed regulations, then, unjustifiably reduce their protections.

The level of protection setbacks and location restrictions provide is unclear. However, if MDE allows fracking in the State and intends to rely on setbacks to mitigate some of the harms

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<sup>154</sup> Md. Code Regs. 26.19.18 § G (Proposed 2015).

<sup>155</sup> *Issue Papers*, *supra* note 74, at 20. The Issue Papers also suggest that “[o]ffsite development of gathering lines, compressor stations, and other infrastructure will be regulated by federal, State and local laws and regulations pertinent to these activities.” *Id.* However—except for noting Garrett and Allegany Counties’ buffers for streams and the State’s buffer for wetlands—the Issue Papers do not provide details about what these “federal, State and local laws and regulations” are and whether they are sufficiently protective of the environment and public health. *Id.* Moreover, there are gaps in federal and State oversight of gathering lines, and MDE’s risk assessment noted that, “there are essentially no controls” on gathering lines’ damaging impacts like “cumulative ecological impacts, habitat destruction and forest fragmentation.” Md. Dep’t of the Env’t & Md. Dep’t of Nat. Res., *Assessment of Risks from Unconventional Gas Well Development in the Marcellus Shale of Western Maryland, Appendix J 1* (2015), available at <http://tinyurl.com/jjxrncn>.

<sup>156</sup> *Issue Papers*, *supra* note 74, at 20.

<sup>157</sup> Brittingham et al., *supra* note 37, at 11036 (noting that compressor stations are noisy and that wildlife may avoid noisy areas near compressor stations); *see also* Towson Univ., Reg’l Econ. Studies Inst., *supra* note 37, at 93 (“The presence of compressor stations and truck traffic related to drilling increases noise and road usage.”).

<sup>158</sup> Md. Code Regs. 26.19.20 (Proposed 2016).

<sup>159</sup> Md. Dep’t of the Env’t & Md. Dep’t of Nat. Res., *Assessment of Risks from Unconventional Gas Well Development in the Marcellus Shale of Western Maryland, Appendix C 11* (2015), available at <http://tinyurl.com/j7854pn> (“Creation and maintenance of roads sufficient to accommodate truck traffic can generate sediment pollution and increase forest loss. The potential changes to water quality from construction activities could impact aquatic species via sediment impacts to streams from road construction. Sedimentation will have a negative effect on rare fish and sensitive mussels. Dirt/dust from truck traffic can pollute streams. There is also potential for sediment impacts to streams from stormwater flows during and after road construction.”).

<sup>160</sup> *See Issue Papers*, *supra* note 74, at 24.

from fracking, then properly designed setbacks are necessary. Yet, MDE has weakened several of its setback requirements, in some instances in ways that run counter to its previous findings. As a result, the proposed setbacks do not sufficiently protect public health and the environment from the adverse effects of fracking.

**D. The regulations allow operators to dispose of solid fracking waste in an unsafe manner.**

Each gas well in the Marcellus Shale generates between 500 and 700 tons of solid waste<sup>161</sup> in the form of drill cuttings, drilling mud, scale, sludge, fracking sand, and treatment residuals.<sup>162</sup> These wastes can contain a suite of natural and human-made pollutants, including significant concentrations of dissolved sodium, calcium, chloride, barium, magnesium, strontium, potassium, diesel residue, and radium.<sup>163</sup> Drilling unearths naturally occurring radioactive material, including radium, which can pose a risk to human health without proper disposal.<sup>164</sup> Radium persists for a long time in the environment and, as more enters the environment, it gradually accumulates.<sup>165</sup> Exposure to radiation, even in low amounts, increases a person's risk of developing cancer, lymphoma, diseases affecting the formation of the blood, and problems with the neurological, reproductive, and cardiac systems.<sup>166</sup>

Solid fracking wastes are exempt from federal and State hazardous waste regulations.<sup>167</sup> They receive this exemption even though the same chemicals contaminating fracking waste are regulated as “hazardous wastes” when used for non-oil-and-gas-related purposes.<sup>168</sup> As a result of this exemption, operators can dispose of untreated cuttings by burying them onsite, if they meet as yet unspecified criteria for radiation, sulfates, and salinity.<sup>169</sup> For cuttings that exceed contaminant

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<sup>161</sup> Earthworks, *Wasting Away: Four States Failure to Manage Oil & Gas Field Waste* 7 (2015), available at <http://tinyurl.com/gu6koh4>.

<sup>162</sup> *MSSDI Report III*, *supra* note 16, at 35.

<sup>163</sup> Earthworks, *supra* note 161, at 7, 28. Some of the substances listed are primarily found in liquid fracking wastes. *Id.* at 7. However, operators often transform liquid waste into solid waste. *Id.* at 28 (“Certain wastes might fit the general definition of solid, including drill cuttings, muds, and fracturing sand—but when loads are brought to the surface after drilling, they contain fluids and formation water and form sludges. Produced water, flowback, and fracturing fluids are primarily disposed of at industrial or municipal wastewater treatment plants, but can also end up in landfills designed for solid waste. For example, between 2012 and 2014, operators in Pennsylvania reported sending over 260,000 barrels of ‘drilling fluid waste,’ ‘fracking fluid waste,’ ‘produced fluid,’ and ‘servicing fluid’ to landfills.”).

<sup>164</sup> See *MSSDI Report III*, *supra* note 16, at 33-34.

<sup>165</sup> See *id.* at 34.

<sup>166</sup> See *Effects of Radiation*, Env'tl. Pollution Ctrs., <http://tinyurl.com/zv15fcl> (last visited Nov. 9, 2016); Jie Zou, *Fracking Produces Tons of Radioactive Waste. What Should We Do with It?*, Grist.com (Jun. 20, 2016), <http://tinyurl.com/gvbxprd>.

<sup>167</sup> Kosnick, *supra* note 6, at 2 (noting that fracking wastes are exempt from the Resource Conservation and Recovery Act and the Comprehensive Environmental Response, Compensation, and Liability Act); Md. Code Regs. 26.13.02.04-1. (“Drilling fluids, produced waters, and other wastes associated with the exploration, development, or production of crude oil, natural gas, or geothermal energy” are not “hazardous wastes”).

<sup>168</sup> Earthworks, *supra* note 161, at 9-10. The four technical criteria that EPA uses to determine if a waste exhibits “hazardous” characteristics are ignitability, corrosivity, reactivity, and toxicity. *Id.* at 9. Non-fracking waste is considered hazardous if it exhibits *any* of the four characteristics. *Id.*

<sup>169</sup> Md. Code Regs. 26.19.54 § H (Proposed 2016).

thresholds and for all other solid fracking-related wastes, the “hazardous waste” exemption also allows operators to dispose of these potentially dangerous wastes in sanitary landfills.<sup>170</sup>

Maryland laws allow operators to dump dangerous fracking wastes in sanitary landfills, where they present a risk to workers and can contaminate air and water. If the “hazardous waste” loophole were abolished and fracking’s solid wastes were properly classified, they would be deposited in specially permitted hazardous waste management facilities that would ensure their safe disposal.<sup>171</sup> Hazardous waste management facilities in Maryland are required to take additional disposal safety measures that sanitary landfills are not, such as using double, rather than single, liners and leachate collection systems.<sup>172</sup> Furthermore, toxic and radioactive substances can also reach surface water if the landfill leachate is treated in publically-owned treatment works<sup>173</sup> that are not required to test for or remove radiation.<sup>174</sup>

Other states limit the amount of fracking waste that municipal landfills can receive. Some require landfills to install radiation detectors and to prohibit disposal of wastes that exceed a radiation threshold. For example, in 2012, 1,000 trucks carrying shale waste triggered radioactivity detectors at landfills in Pennsylvania. Some of the waste was so radioactive that the landfills refused it, deeming it too hazardous for disposal.<sup>175</sup>

Maryland imposes no such limits, or even reporting requirements, on the disposal of fracking waste in municipal landfills.<sup>176</sup> MDE’s decision to allow fracking to proceed without any provisions in place to ensure the proper disposal of solid waste is one more example of why these proposed regulations fail to protect public health and the environment from fracking’s harms and why fracking in the state of Maryland should not be allowed.

### III. Conclusion

Maryland should leave its natural gas in the ground. Marylanders do not need this gas, but they do need clean air and water. Furthermore, a healthy environment is their inalienable right

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<sup>170</sup> See *MSSDI Report III*, *supra* note 16, at 37 (suggesting that fracking waste generated in Maryland would be sent to municipal landfills).

<sup>171</sup> *Hazardous Waste Management Facilities and Hazardous Waste Management Units*, U.S. Evtl. Prot. Agency, <http://tinyurl.com/jtk4z2b> (last visited Nov. 27, 2016).

<sup>172</sup> *Id.* (stating that two liners and leachate collection systems are required for hazardous waste landfills); Md. Code Regs. 26.04.07.07 § C(12), 26.04.07.19 § C(2) (requiring only one liner and leachate collection system for sanitary industrial waste landfills).

<sup>173</sup> See *id.*; see also Garret County, *2014-2024 Solid Waste Management Plan 3-37*, available at <http://tinyurl.com/jtj2wx2> (noting that the Garret County landfill sends its leachate to the Deep Creek Lake Wastewater Treatment Facility).

<sup>174</sup> Earthworks, *supra* note 161, at 20 (“[W]astewater treatment plants where landfill leachate is sent for disposal do not generally monitor for Ra-226 and Ra-228 [(radium)] prior to release into rivers and streams because federal National Pollutant Discharge Elimination System (NPDES) permits don’t require them to”) (citations omitted).

<sup>175</sup> *Id.* at 9-10. 1,000 trucks is likely a conservative estimate considering radioactive waste monitors in Pennsylvania landfills are usually set to only very high levels of radiation—levels dangerous for close human contact. *Id.* at 24. This means that many more trucks containing radioactive material are likely to be disposed of in Pennsylvania and other Marcellus shale states each year.

<sup>176</sup> *MSSDI Report III*, *supra* note 16, at 37.

under law. The regulations will not adequately protect residents, local waterways, or the environment; it is likely that the regulations will be under-enforced and the gas operations under-monitored, either because the agency is too responsive to industry's desires or because MDE lacks adequate resources to regulate a dangerous process properly. However, even where these regulations are at their strongest, they cannot protect the public health and safety of Marylanders. Study after study, well after well reveals that no set of regulations, not even what MDE would consider the "most stringent and protective,"<sup>177</sup> can reduce the risks of fracking to an acceptable level. The only way MDE can fulfill its legal and moral obligation to keep its citizens safe and to steward the State's natural resources is for MDE to prohibit hydraulic fracturing.

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<sup>177</sup> Dance, *supra* note 69.