

August 3, 2012

Mr. Michael K. Burton  
Tennessee Department of Environment and Conservation  
6<sup>th</sup> Floor, L & C Annex  
401 Church Street  
Nashville, TN 37243-1534  
Submitted via email: [Michael.K.Burton@tn.gov](mailto:Michael.K.Burton@tn.gov)

**Re: Comments on Tennessee's proposed 2011 amendments to Oil and Gas drilling regulations**

Dear Mr. Burton:

We appreciate the opportunity to submit these comments regarding the Tennessee Department of Environment and Conservation's ("TDEC's") proposed revisions to the Rules of the Tennessee Oil and Gas Board on behalf of the Southern Environmental Law Center, the Southeast Region of the National Parks Conservation Association, the Tennessee Chapter of the Sierra Club, Tennessee Citizens for Wilderness Planning, the Tennessee Environmental Council, and the Tennessee Office of Public Employees for Environmental Responsibility. We applaud TDEC's leadership on the issue of hydraulic fracturing and its efforts to ensure that this method of natural gas production in Tennessee be conducted in a manner that is protective of environmental quality and human health and safety.

While the regulations proposed by TDEC represent an admirable first step toward regulating hydraulic fracturing operations in Tennessee, a number of changes are necessary to make the final regulations environmentally adequate. We fully support those comments already submitted by the Tennessee Clean Water Network, the Tennessee Chapter of the Sierra Club, Tennessee Citizens for Wilderness Planning, and the Harpeth River Watershed Association (collectively, the "TCWN comments"). The TCWN comments provided TDEC with a line-by-line recommended revision of the proposed regulations that addressed a wide range of environmental issues, including water quality protection, fracturing chemical disclosure, and well-integrity standards. TCWN's edits to the regulations are thoughtful and well-supported by the facts and the law, and we fully support their inclusion in TDEC's final regulations.

In addition, we ask TDEC to consider these comments on the following issues: (1) Chemical Disclosure; (2) Protection of Wildlife Resources; (3) Incorporation of API Standards; and (4) Strategies to Manage Resource Constraints.

I. TDEC should strengthen its post-hydraulic fracturing disclosure requirements.

We would like to commend TDEC for proposing to amend Rule 0400-53-01-.03 to require that post-drilling reports include actual volumes used to fracture, amounts/concentrations of all additives used in fracturing, the amount of wastewater generated and the method of disposal. Public disclosure of this type of information is required by almost every state that has addressed hydraulic fracturing, and it is appropriate for Tennessee to do so as well. However, without certain modifications, this disclosure may be ineffective and not meaningful. Therefore, we have 3 comments:

1. First, TDEC must be more specific about the information required as to the additives used. For "additive products," TDEC should very specifically require the disclosure of each additive used in

the fracturing fluid, together with the trade name, the vendor, and a brief description of the function of each additive.

2. In addition, it is imperative that TDEC also require the disclosure of each chemical used, together with the Chemical Abstract Number<sup>1</sup> for that chemical. Since additives are composed of multiple chemical ingredients, disclosure of the additive only, without a disclosure of the chemical ingredients, may be meaningless, and for this reason, chemical composition must be disclosed.<sup>2</sup> Indeed, only by knowing the names of chemicals can states, local governmental entities, and neighboring landowners understand any potential health impacts and adequately test for the presence of any chemicals in nearby ground or surface water.
3. Finally, while TDEC states in its Notice of Rulemaking Hearing that it will require the post-drilling information to be entered by the operator on a public website, either one set up by the state or one set up by industry, TDEC should specifically require this in its regulations, prescribe a time by which that must be done, and impose appropriate sanctions on anyone who fails to do so.

Both state and federal regulators recognize that disclosure of both fracturing fluid and chemicals is necessary and important to protect human health and the environment.

According to OMB Watch, at least 17 states have proposed or current regulations that require some form of disclosure of fracturing fluids, and of those at least 13 require disclosure of all specific chemicals, while the other 4 require disclosure of those chemicals with Material Safety Data Sheets.<sup>3</sup> This study notes that the most effective disclosure provisions would provide all residents of a state, including property owners, regulators, and workers, sufficient information to evaluate the risks and benefits of drilling. That information should include chemical identifier numbers, the base products they are in, and the concentrations of chemicals used in each well.<sup>4</sup> The Council of State Governments, a bipartisan nonprofit organization that serves state governments, issued model legislation (adopting the Texas law) requiring disclosure of fracturing fluid and specific chemicals used.<sup>5</sup> The State Review of Oil & Natural Gas Environmental Regulations (“STRONGER”),<sup>6</sup> also provides in its guidelines that regulatory agencies should require notification prior to,

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<sup>1</sup> The CAS number, assigned by the American Chemical Society, is regarded as the authoritative identifier for a chemical and is important in determining interaction effects with other chemicals. Material Data Safety Sheets, on the other hand, are not an accurate source to ascertain the chemicals in a product (for example, they do not list all ingredients in a product and are self-reported by manufacturers, with no independent verification). See OMB Watch, “The Right to Know: The Responsibility to Protect: How State Actions are Inadequate to Ensure Effective Disclosure of the Chemicals Used in Natural Gas Fracking,” July 2012, at pp. 23-24, *available at* [http://www.ombwatch.org/files/info/naturalgasfrackingdisclosure\\_med.pdf](http://www.ombwatch.org/files/info/naturalgasfrackingdisclosure_med.pdf). OMB Watch is a nonprofit research and advocacy organization dedicated to building an open, accountable government that invests in the common good, protects people and the environment, and advances national priorities defined by an active, informed citizenry.

<sup>22</sup> See, e.g., 16 Tex. Admin. Code 73.29(c)(2)(ix); Colo. Code Regs. 4 404-1:205A(B)(2)(XII); Wyo. Admin. Code Oil Gen. Ch. 3, § 45(d).

<sup>3</sup> See OMB Watch, “The Right to Know: The Responsibility to Protect: How State Actions are Inadequate to Ensure Effective Disclosure of the Chemicals Used in Natural Gas Fracking”, July 2012, at p. 28-50, *available at* [http://www.ombwatch.org/files/info/naturalgasfrackingdisclosure\\_med.pdf](http://www.ombwatch.org/files/info/naturalgasfrackingdisclosure_med.pdf).

<sup>4</sup> *Id.* at 24-25.

<sup>5</sup> See The Council of State Governments, “Disclosing Composition of Hydraulic Fracturing Fluids,” Oct. 2011, *available at* <http://ssl.csg.org/dockets/2013cycle/2013sslvolume/2013SSLdraftsdisclosingfracturingfluid2013ssl.pdf>. Even the American Legislative Exchange Council (“ALEC”), a group widely regarded as opposed to government regulation, has published model legislation requiring disclosure of fracturing fluids. See Mike McIntyre, “Conservative Nonprofit Acts as a Stealth Business Lobbyist,” *The New York Times*, Apr. 12, 2012, *available at* <http://www.nytimes.com/2012/04/22/us/alec-a-tax-exempt-group-mixes-legislators-and-lobbyists.html?pagewanted=all>.

<sup>6</sup> STRONGER is a collaborative process by which review teams composed of stakeholders from the oil and gas industry, state environmental regulatory programs, and members of the environmental/public interest communities review state

and reporting after completion of, hydraulic fracturing operations, and that disclosure should include the identification of materials used, including the chemical constituents.<sup>7</sup> Even the Appalachian Shale Practice Group, a consortium of 11 of the Appalachian Basin's largest natural gas and oil producers, recently recommended that operators "[c]ommit to transparency in their operations by disclosing composition of hydraulic fracturing fluid additives . . . ."<sup>8</sup>

Federal authorities agree that disclosure of fluids and chemicals is essential. The Secretary of Energy Advisory Board, Shale Gas Production Subcommittee, issued its first 90-day report on August 18, 2011 and made 20 recommendations "to assure that the nation's considerable shale gas resources are being developed responsibly, in a way that protects human health and the environment and is most beneficial to the nation."<sup>9</sup> In recommending the disclosure of fracturing fluid composition, it stated "the Subcommittee believes there is no economic or technical reason to prevent public disclosure of all chemicals in fracturing fluids . . . ."<sup>10</sup> The National Park Service ("NPS") regulations and current legal and policy requirements provide the NPS with the ability to require disclosure of the specific chemicals and quantities used in fracturing operations, and can also require the use of less toxic chemicals if technically feasible.<sup>11</sup>

Similarly, the Department of Interior has proposed in its regulations for fracturing on public land that operators disclose the makeup of the fracturing fluid as well as the identity of the chemicals used, with CAS numbers.<sup>12</sup> Moreover, chemical disclosure will help "restore public confidence" in the oil and gas industry, as Colorado Governor John Hickenlooper said in response to citizen concerns about fracturing. Colorado soon after approved one of the most comprehensive disclosure rules, requiring comprehensive disclosure of fracturing fluids and chemicals (with CAS numbers) on FracFocus.org.

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oil and gas waste management programs against a set of guidelines developed and agreed to by all the participating parties. Additional information about and reports from STRONGER are available at <http://www.strongerinc.org>.

<sup>7</sup> See *STRONGER Guidelines* available at <http://www.strongerinc.org/stronger-guidelines>.

<sup>8</sup> Appalachian Shale Recommended Practices Group, *Recommended Standards and Practices*, Apr. 2012, available at [http://www.eqt.com/docs/pdf/ASRPG\\_Standards\\_and\\_Practices.pdf](http://www.eqt.com/docs/pdf/ASRPG_Standards_and_Practices.pdf).

<sup>9</sup> As the Second 90 Day Report explains: "The Shale Gas Subcommittee of the Secretary of Energy Advisory Board is charged with identifying measures that can be taken to reduce the environmental impact and to help assure the safety of shale gas production. Shale gas has become an important part of the nation's energy mix. It has grown rapidly from almost nothing at the beginning of the century to near 30 percent of natural gas production. Americans deserve assurance that the full economic, environmental and energy security benefits of shale gas development will be realized without sacrificing public health, environmental protection and safety. On August 18, 2011 the Subcommittee presented its initial Ninety-Day Report, including twenty recommendations that the Subcommittee believes, if implemented, would assure that the nation's considerable shale gas resources are being developed responsibly, in a way that protects human health and the environment and is most beneficial to the nation." U.S. Dep't of Energy, Secretary of Energy Advisory Board, *Shale Gas Production Subcommittee Second Ninety Day Report*, Nov. 18, 2011, "Executive Summary," available at [http://www.shalegas.energy.gov/resources/111811\\_final\\_report.pdf](http://www.shalegas.energy.gov/resources/111811_final_report.pdf).

<sup>10</sup> *Id.*

<sup>11</sup> See U.S. Dep't of the Interior, Nat'l Park Service, *Big South Fork National River and Recreation Area and Obed Wild and Scenic River: Final Non-Federal Oil and Gas Management Plan/Environmental Impact Statement*, July 2012, "Statutory and Regulatory Requirements and Mitigation Measures for Non-Federal Oil and Gas Operations," p. 64, available at <http://parkplanning.nps.gov/documentsList.cfm?parkID=354&projectID=10911>.

<sup>12</sup> Proposed 43 CFR § 3162.3-3(g)(4) and (5) would require: "(4) A report (table) that discloses all additives of the actual stimulation fluid, by additive trade name and purpose (such as, but not limited to, acid, biocide, breaker, brine, corrosion inhibitor, crosslinker, demulsifier, friction reducer, gel, iron control, oxygen scavenger, pH adjusting agent, proppant, scale inhibitor, or surfactant); and (5) A report (table) that discloses the complete chemical makeup of all materials used in the actual stimulation fluid without regard to original source additive (see paragraph (g)(4) of this section). For each chemical, the operator must provide the Chemical Abstracts Service Registry Number as well as the percentage by mass. The percent mass value is the mass value for each component (Mc) divided by the value of the entire fluid mass (Mt) times 100. (Mc/Mt)\*100 = percent value. The percent mass values should be for the entire stimulation operation, not for the individual stages."

New information and research has continued to emerge which demonstrates the importance of disclosing the composition of fracturing fluids and all chemicals the fluid contains. In December, 2011, a noteworthy EPA study regarding drilling and hydraulic fracturing documented a possible link between hydraulic fracturing operations, drilling waste pits, and groundwater contamination in Pavillion, Wyoming.<sup>13</sup> In addition, a recent study out of Duke University shows connectivity between groundwater and the deep Marcellus shale layer. Before this, many people thought that a connection between the deep shale layer and shallow drinking water aquifers was impossible.<sup>14</sup> These recent studies demonstrate all the more reason to require very specific disclosure of the composition of fracturing fluids and the chemicals contained therein.

In sum, TDEC should modify its proposed regulations to: (1) require specific information about the additives in the fracturing fluids; (2) require identification of chemicals used by the Chemical Abstract Number; and (3) direct how and when that information should be disclosed, and the consequences for failing to do so.

## II. TDEC should require disclosure of fracturing fluids and chemicals prior to hydraulic fracturing.

TDEC has proposed to amend Rule 0400-52-02-.02(1) to require that in applying for a permit, an applicant disclose intent to fracture, and an estimate of the volume of fracturing fluids to be used. Citing cost concerns, TDEC has proposed to allow public notice and comment only where that volume of fluid exceeds 200,000 gallons, and for all other fractured wells, simply, to post on its website all new wells permitted, together with basic information on each well, including the “name, well #, county, lat/long, horizontal or vertical, intent to fracture, etc.”

TDEC should require that under Rule 0400-52-02-.02(1), all applicants also disclose the composition of the fracturing fluid and the chemicals to be used, regardless of whether the volume exceeds 200,000 gallons. If the volume of fluid does not exceed 200,000 gallons, TDEC should post this information (the composition of the fracturing fluid and the chemicals to be used) with the other general information about the well on its website.

Without any increased cost to TDEC, this disclosure would resolve some of the concerns raised by the lack of public participation in the permitting of wells using less than 200,000 gallons of fluid.<sup>15</sup> Particularly given that fracturing fluid contains known toxic chemicals, which can significantly affect human health even in relatively small quantities, there is little reason to link chemical disclosure to the total volume of fracturing fluid used, as TDEC is proposing.

As noted by the OMB Watch report, the most effective disclosure provisions require prior notice of chemicals to be used in fracturing. First, this informs neighborhoods, local governmental entities, nearby landowners, and other concerned individuals about the drilling activities that might impact them. Those

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<sup>13</sup> In December 2011, the EPA issued a draft report documenting a possible link between hydraulic fracturing operations, drilling waste pits, and groundwater contamination in Pavillion, Wyoming. In preliminary findings, EPA concluded the groundwater sampled from the site of the fracturing operations contained synthetic chemicals used in gas drilling and hydraulic fracturing fluids, benzene concentrations well above Safe Drinking Water Act standards, and high methane levels. Samples taken from public and private drinking water wells in the community also detected methane, other petroleum hydrocarbons and other chemical compounds, suggesting those substances migrated into water wells as a result of gas drilling. See U.S. Env'tl Protection Agency, *Draft Investigation of Ground Water Contamination Near Pavillion, Wyoming*, Dec. 8, 2011, available at [www.epa.gov/region8/superfund/wy/pavillion/EPA\\_ReportOnPavillion\\_Dec-8-2011.pdf](http://www.epa.gov/region8/superfund/wy/pavillion/EPA_ReportOnPavillion_Dec-8-2011.pdf).

<sup>14</sup> Christopher Joyce, “Rising Shale Water Complicates Fracking Debate,” *NPR*, July 9, 2012, available at <http://www.npr.org/2012/07/09/156505748/rising-shale-water-complicates-fracking-debate>.

<sup>15</sup> We also fully support TCWN’s comments regarding public disclosure of the intent to fracture all wells, regardless of volume. The public availability of information regarding *both* intent to fracture and chemicals used in fracturing treatment is vital to ensuring oil and gas operations in Tennessee are conducted in a manner protective of environmental quality and human health and safety.

concerned about the about the activity then have the opportunity to conduct baseline water and well sampling, and know what chemicals and substances to test for. Second, disclosure of this information permits healthcare personnel and emergency responders to effectively treat anyone who may be injured by coming into contact with the fluids and chemicals used. Third, well operators may be more likely to use less harmful chemicals, knowing chemical disclosure information would be made public. A disclosure regime highlights responsible corporate citizens, as well as practices that may jeopardize health and the environment. And, finally, a disclosure program is essential to facilitate research to understand the costs of fracturing and to serve as a basis for well-informed regulation.<sup>16</sup> Currently, six states (Arkansas, Wyoming, West Virginia, Indiana, Montana, and Pennsylvania – and New York in its proposed regulations) provide some kind of pre-fracturing chemical disclosure, for precisely these reasons.<sup>17</sup>

Finally, and importantly given TDEC's limited resources, this would impose no additional cost on either TDEC (as it is already posting basic information), or on well operators (as they will know what they are using to fracture).

In sum, TDEC should require disclosure of chemicals planned to be used in fracturing and anticipated volumes of fluid for all wells, and for wells with less than 200,000 gallons, TDEC should post this information on its website with other general information about the well.

### III. TDEC's revised regulations should avoid, minimize, and mitigate adverse impacts to wildlife resources.

Gas production involving high-volume hydraulic fracturing is known to cause adverse impacts to wildlife, including: (1) fragmentation of habitat, (2) potential transfer of invasive species, and (3) potential impacts on endangered and threatened species.<sup>18</sup> Land grading and clearing, the construction of well pads, and development of roads, pipelines, and other infrastructure necessary for hydraulic fracturing operations may result in habitat fragmentation, which has been identified as “one of the greatest threats to biological diversity.”<sup>19</sup> Also, the large number of vehicle trips associated with hydraulic fracturing treatment has been identified as an activity which presents the opportunity for introduction of non-native species that cause or are likely to cause economic harm, environmental harm, or harm to human health.<sup>20</sup> Clearing, grading, and road construction activities also may destroy or degrade habitats of endangered and threatened species.<sup>21</sup>

The draft regulations do not address any of these potential adverse impacts to wildlife. As pointed out by The Nature Conservancy last year, TDEC needs to consider the cumulative impacts of gas wells and associated infrastructure on wildlife habitats in Tennessee.<sup>22</sup> More recently, the National Park Service's evaluation of oil and gas operations in the Big South Fork National River and Recreation Area confirmed that

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<sup>16</sup> See NRDC Issue Brief, “State Hydraulic Fracturing Disclosure Rules and Enforcement: A Comparison,” July 2012, available at <http://www.nrdc.org/energy/fracking-disclosure.asp>.

<sup>17</sup> See OMB Watch, “The Right to Know: The Responsibility to Protect: How State Actions are Inadequate to Ensure Effective Disclosure of the Chemicals Used in Natural Gas Fracking,” July 2012, available at [http://www.ombwatch.org/files/info/naturalgasfrackingdisclosure\\_med.pdf](http://www.ombwatch.org/files/info/naturalgasfrackingdisclosure_med.pdf).

<sup>18</sup> New York State Dep't of Env'tl Conservation, *Revised Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas and Solution Mining Regulatory Program*, Sept. 2011 (hereinafter, “NY RDSGEIS”), “Chapter 6 – Potential Environmental Impacts,” p. 6-67, available at [http://www.dec.ny.gov/docs/materials\\_minerals\\_pdf/rdsgeisch6a0911.pdf](http://www.dec.ny.gov/docs/materials_minerals_pdf/rdsgeisch6a0911.pdf).

<sup>19</sup> *Id.*, at pp. 6-68 to 6-69.

<sup>20</sup> *Id.*, at p. 6-84.

<sup>21</sup> *Id.*, at p. 6-88.

<sup>22</sup> Letter from Sally Palmer, Director of Science, The Nature Conservancy, Tennessee Chapter, to Michael K. Burton, TDEC, “Re: Comments on Tennessee's proposed 2011 changes to Oil and Gas drilling regulations,” dated May 9, 2011 (hereinafter “TNC Letter”), p. 1.

oil and gas operations pose significant threats to Tennessee wildlife and aquatic species.<sup>23</sup> The National Park Service report also makes clear that, because there is a lack of frequent inspections and monitoring of all oil and gas operations, more protective operating standards and mitigation measures for unavoidable adverse impacts are needed.<sup>24</sup> In its final regulations, TDEC should ensure that wildlife impacts are adequately addressed by requiring consultation with the Tennessee Wildlife Resources Agency (“TWRA”), the state agency with the requisite wildlife expertise, prior to issuance of permits to conduct oil and gas operations, and incorporating TWRA recommendations to avoid, minimize, and mitigate adverse impacts to wildlife as conditions of any permit issued.<sup>25</sup>

In developing hydraulic fracturing regulations, other states have studied wildlife impacts extensively<sup>26</sup> and learned that the most efficient regulatory approach is for the oil and gas permitting authority to consult with the agency responsible for managing wildlife resources to leverage its existing knowledge and expertise of wildlife considerations.<sup>27</sup> Furthermore, the consultation recommended at the state level has been consistent with the U.S. Department of Energy’s recommended approach of “[u]ndertaking science-based characterization of important landscapes, habitats and corridors to inform planning, prevention, mitigation and reclamation of surface impacts.”<sup>28</sup> Even industry recognizes that “avoidance of development on ecologically sensitive areas is often the most prudent course of action” and “[i]f avoidance is not an option, mitigation planning, in conjunction with the appropriate regulatory bodies, is needed.”<sup>29</sup>

While Tennessee may currently lack a comprehensive habitat characterization or evaluation program – such as the existing programs enjoyed by Colorado and New York – TWRA has been engaged in development of a Forest Resources Habitat Conservation Plan for several Wildlife Management Areas in the Northern Cumberlands region.<sup>30</sup> TDEC should take advantage of the work already done by TWRA in a region expected to be a hotbed of gas production using hydraulic fracturing, and should further avail itself of TWRA’s expertise and resources to consider site-by-site wildlife protections prior to issuing permits.

Specifically, TDEC should revise the proposed regulations to provide that no permit shall be issued until the operator, surface owner, TWRA, and TDEC have consulted on wildlife issues. Any permit to conduct gas operations using hydraulic fracturing should incorporate as conditions any recommendations made by TWRA

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<sup>23</sup> U.S. Dep’t of the Interior, Nat’l Park Service, *Big South Fork National River and Recreation Area and Obed Wild and Scenic River: Final Non-Federal Oil and Gas Management Plan/ Environmental Impact Statement*, July 2012, pp. 289-301, available at <http://parkplanning.nps.gov/document.cfm?documentID=48597>.

<sup>24</sup> *Id.*, at 292.

<sup>25</sup> *Id.*, at 295. We commend TDEC for its cooperative agreement with the NPS to plug and reclaim 14 wells at Big South Fork NRR. TDEC should incorporate this cooperative spirit into its final regulations applicable to non-federal lands in Tennessee to ensure that wildlife impacts are fully addressed through consultation with TWRA, as the state agency with extensive wildlife expertise.

<sup>26</sup> See NY RDSGEIS, “Chapter 6.4 – Ecosystems and Wildlife,” available at [http://www.dec.ny.gov/docs/materials\\_minerals\\_pdf/rdsgeisch6a0911.pdf](http://www.dec.ny.gov/docs/materials_minerals_pdf/rdsgeisch6a0911.pdf), and Colorado Oil & Gas Conservation Commission, *Rules of Practice & Procedure*, “Appendix VIII: Sensitive Wildlife Habitat Maps,” available at <http://cogcc.state.co.us/>.

<sup>27</sup> See Colorado Oil & Gas Conservation Commission, “Rule 306 – Consultation,” and “Rule 1200 Series – Protection of Wildlife Resources,” available at <http://cogcc.state.co.us/>.

<sup>28</sup> U.S. Dep’t of Energy, Secretary of Energy Advisory Board, *Shale Gas Production Subcommittee Second Ninety Day Report*, Nov. 18, 2011, “Annex C – Subcommittee Recommendations,” p. 17, available at [http://www.shalegas.energy.gov/resources/111811\\_final\\_report.pdf](http://www.shalegas.energy.gov/resources/111811_final_report.pdf).

<sup>29</sup> The Marcellus Shale Coalition’s recommended practices for addressing the adverse impacts of oil and gas operations on wildlife resources encourage consultation with operators, surface owners, responsible agencies, and non-governmental organizations with expertise related to wildlife issues. Marcellus Shale Coalition, *Recommended Practices: Site Planning, Development and Restoration*, “Section 4.5 – Apply Constraints Information to Refine Concept,” “Appendix A – Forestry Restoration Practices,” “Appendix C – Restoring Forest Openings for Wild Turkey and other Wildlife Species,” and “Appendix D – Federal and State Regulatory and Conservation Agencies,” Apr. 26, 2012, available at <http://marcelluscoalition.org/wp-content/uploads/2012/04/Site-Planning-Development-and-Restoration.pdf>.

<sup>30</sup> TNC letter, at p. 2.

to: (i) avoid adverse impacts from oil and gas operations on wildlife resources, (ii) minimize the extent and severity of those impacts that cannot be avoided, (iii) mitigate the effects of unavoidable remaining impacts, and (iv) take into consideration cost-effectiveness and technical feasibility with regard to actions taken and decisions made to minimize adverse impacts to wildlife resources.<sup>31</sup>

However, merely having a consultation requirement on the books will not result in adequate resource protection for Tennessee. We encourage TDEC to engage in an ongoing dialogue with TWRA and stakeholders to ensure that all adverse impacts to wildlife resources are considered and all feasible measures are adopted to avoid, minimize, and mitigate those impacts.

IV. TDEC's revised regulations should be made at least as protective of water resources as the API standards, tailored to local conditions, and applied comprehensively to hydraulic fracturing treatment in Tennessee.

Groundwater and surface water contamination is one of the most widely recognized environmental and public health and safety hazards presented by hydraulic fracturing.<sup>32</sup> While we appreciate TDEC's recognition that merely referencing the American Petroleum Institute ("API") standards for oil and gas operations may not be sufficiently protective of Tennessee water resources,<sup>33</sup> the recommendations from regulated industry that are embodied in the API standards must serve as a "floor" of protection. The draft regulations do not meet that floor because they fail to require water-protection measures at least as protective as the API standards.

We encourage TDEC to "take into consideration local conditions," and tailor the requirements of the final regulations to respond to the environmental realities of oil and gas operations in Tennessee, using the API standards as a baseline of minimum protection. The karst topography of Tennessee and the anticipated development of the Chattanooga and Conasauga shale gas found here present threats to groundwater and surface water at least as significant as the threats facing our flatter neighbors. While API's standards may be "nationally" focused, they represent industry-accepted practices and are helpful in addressing the very real and unique challenges of hydraulic fracturing in Tennessee.

Indeed, the Bureau of Land Management in its draft regulations applicable to public lands, has incorporated API Standards in its regulations, which state: "The BLM's proposed rule is consistent with the American Petroleum Institute's (API) guidelines for well construction and well integrity (see API Guidance Document HF 1, Hydraulic Fracturing Operations—Well Construction and Integrity Guidelines, First Edition, October

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<sup>31</sup> Colorado Oil & Gas Conservation Commission, "Rule 1202(a) – Consultation," available at <http://cogcc.state.co.us/>.

<sup>32</sup> See, e.g., U.S. Dep't of Energy, Secretary of Energy Advisory Board, *Shale Gas Production Subcommittee Second Ninety Day Report*, Nov. 18, 2011, "Annex C – Subcommittee Recommendations," p. 17, available at [http://www.shalegas.energy.gov/resources/111811\\_final\\_report.pdf](http://www.shalegas.energy.gov/resources/111811_final_report.pdf) (recommending "adoption of a systems approach to water management based on consistent measurement and public disclosure of the flow and composition of water at every stage of the shale gas production process" for protection of water quality); Nathaniel R. Warner, et al., "Geochemical evidence for possible natural migration of Marcellus Formation brine to shallow aquifers in Pennsylvania," PNAS Early Edition, published online July 9, 2012, <http://www.pnas.org/content/109/30/11961> (concluding that hydraulic fracturing may result in an "increased risk for contamination of shallow drinking water resources, particularly by fugitive gases, because of natural hydraulic connections to deeper formations"); and U.S. Env'tl Protection Agency, Office of Research and Development, "Draft Investigation of Ground Water Contamination near Pavillion, Wyoming," available at [http://www.epa.gov/region8/superfund/wy/pavillion/EPA\\_ReportOnPavillion\\_Dec-8-2011.pdf](http://www.epa.gov/region8/superfund/wy/pavillion/EPA_ReportOnPavillion_Dec-8-2011.pdf) (concluding "that constituents associated with hydraulic fracturing have been released into the ... drinking water aquifer at depths above the current production zone").

<sup>33</sup> TDEC, *Notice of Rulemaking Hearing*, "Summary of Proposed Rulemaking – More stringent/better codified casing requirements," p. 3, available at [http://tn.gov/environment/wpc/ppo/og\\_ph071012.pdf](http://tn.gov/environment/wpc/ppo/og_ph071012.pdf).

2009).<sup>34</sup> This decision was based in part on the recommendations issued by the Secretary of Energy's Advisory Board Natural Gas Subcommittee to evaluate hydraulic fracturing issues. The Subcommittee met with industry, service providers, state and Federal regulators, academics, environmental groups, and many others stakeholders. Initial recommendations were issued by the Subcommittee on August 18, 2011. The Subcommittee recommended the adoption of progressive standards for wellbore construction and testing. The final report, issued on November 18, 2011,<sup>35</sup> recommended that operators adopt the best practices, and prepare cement bond logs and undertake pressure testing to ensure the integrity of all casings.<sup>36</sup>

TDEC said only recently that its standards were very similar to those adopted by the Bureau of Land Management.<sup>37</sup> We hope that TDEC will follow the lead of the Bureau of Land Management, adopt similar API standards, and be as protective of all land in Tennessee.

We are not advocating adoption of any irrelevant standards. The comments submitted recently by TCWN and several citizen groups represent a thoughtful and scientifically-sound tailoring of the API standards to the realities of Tennessee,<sup>38</sup> are necessary to adequately protecting groundwater and surface water, and should be adopted in the final regulations.

While TDEC has emphasized that funding limits might impede its ability to offer public participation in the permitting of hydraulic fracturing wells using less than 200,000 gallons of fluid, an even-handed application of the other regulatory requirements to all fracturing operations will not strain TDEC's resources. Tailoring the minimum API standard protections to the realities of Tennessee and applying its regulatory scheme evenly across all hydraulic fracturing in the state would help TDEC fulfill its duty to ensure that oil and gas production proceeds in a manner protective of environmental and public health and safety.

V. TDEC should evaluate resource constraints and increase permitting fees to ensure adequate enforcement of the regulations.

Equally important to having an appropriate regulatory framework is the ability to enforce it. As with many state agencies, TDEC must allocate its limited resources across a wide range of issues. Historically, TDEC has had few dedicated oil and gas compliance personnel, and the anticipated boom in gas development

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<sup>34</sup> Proposed 43 CFR Part 3160, "Oil and Gas; Well Stimulation, Including Hydraulic Fracturing, on Federal and Indian Lands," available at <http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&pageid=293916>.

<sup>35</sup> These reports are available to the public from the U.S. Department of Energy's web site at <http://www.shalegas.energy.gov>. The final report recommendation No. 10 stated: "Adopt best practices in well development and construction, especially casing, cementing, and pressure management. Pressure testing of cemented casing and state-of-the-art cement bond logs should be used to confirm formation isolation. Microseismic surveys should be carried out to assure that hydraulic fracture growth is limited to the gas producing formations. Regulations and inspections are needed to confirm that operators have taken prompt action to repair defective cementing jobs. The regulation of shale gas development should include inspections at safety-critical stages of well construction and hydraulic fracturing."

<sup>36</sup> See the discussion at pp.10-11 of BLM's proposed regulations at <http://www.doi.gov/news/pressreleases/loader.cfm?csModule=security/getfile&pageid=293916>.

<sup>37</sup> TDEC spokeswoman Meg Lockhart said, "What is under consideration is similar to what the federal government has proposed for fracturing on Bureau of Land Management property." *The Tennessean*, "TN works on fracturing rules, but environmentalists say they don't go far enough," Aug. 2, 2012.

<sup>38</sup> The TCWN comments appropriately tailor the Tennessee regulations to all three volumes of API standards, incorporating the relevant portions of API HF1 ("Hydraulic Fracturing Operations – Wells Construction and Integrity Guidelines"), API HF2 ("Water Management Associated with Hydraulic Fracturing"), API HF3 ("Practices for Mitigating Surface Impacts Associated with Hydraulic Fracturing"). TDEC should consider all three volumes of API standards in its revised regulations. See API, "Hydraulic Fracturing," available at <http://www.api.org/oil-and-natural-gas-overview/exploration-and-production/hydraulic-fracturing.aspx>.

facilitated by hydraulic fracturing treatment will only exacerbate the problem.<sup>39</sup> TDEC should evaluate the personnel and resources necessary to effectively enforce its revised oil and gas regulations and adjust its permit application fees and other fees to meet more of those needs.

The lack of resources in the Oil and Gas Program is not a new problem. In its 2007 review of Tennessee's oil and gas program, STRONGER found that TDEC lacked adequate staff and resources to fully and effectively operate the program, to conduct necessary pre-drilling inspections in a timely manner, to allow inspections at any time during the drilling, and to conduct enforcement activities.<sup>40</sup> STRONGER recommended that "the state work with industry and within their statutory framework to clearly define a dedicated source of funding and increase the size of the staff." If staff and resources were not adequate to sustain the oil and gas program at its size five years ago, in 2007, the program's resources will certainly not be adequate to handle the likely increase in gas drilling, particularly unconventional shale gas drilling.<sup>41</sup>

Currently, the regulations contemplate an application fee of \$500 for a permit to drill. However, the draft regulations and introductory information contain no explanation of how this fee was selected or how it will be adjusted to help deal with the increased administrative and enforcement costs that will accompany any increase in drilling for shale gas in Tennessee. TDEC should carefully analyze and then inform the public of how it will select and adjust permit and other fees to ensure compliance with its revised regulations. Pennsylvania, for example, recently increased its permitting fee to an average of \$2,850 per well.<sup>42,43</sup> And at the end of 2011, the West Virginia legislature in special session passed comprehensive fracturing regulations, which sets permit fees at \$10,000 for the first well and \$5,000 for subsequent ones on multiple-well pads.<sup>44</sup>

TDEC needs to make a realistic assessment of what resources it needs to adequately enforce its regulations, and increase fees accordingly.

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<sup>39</sup> Compare the 39 gas wells permitted in Tennessee over a 3 year period with the 3,314 permits issued in Pennsylvania in a single year once its shale gas plays were accessible by hydraulic fracturing. *The Tennessean*, "TN works on fracturing rules, but environmentalists say they don't go far enough," Aug. 2, 2012, online edition.

<sup>40</sup> For example, some of the findings and recommendations included: "Increasing the size of the staff would alleviate a number of concerns that were expressed during the review. Sufficient staff and funding would allow the staff to adequately operate the program and help encourage the economic health of the industry;" "The Review Team recommends that, in order to prevent a backlog of permit applications, adequate resources be provided to conduct the pre-drilling inspections and also allow inspections to occur at any time during the drilling;" and "Conducting compliance evaluations is an important facet of an oil and gas regulatory program and can assist in managing an effective program. Therefore the Review Team recommends that the state increase the number of staff, provide industry-specific training to the staff . . ." STRONGER, Tennessee State Review, Sept. 2007., pp. 4-5, available at <http://67.20.79.30/sites/all/themes/stronger02/downloads/Tennessee%20Initial%20Review%207-2007.pdf>.

<sup>41</sup> At present, TDEC has five employees on the oil and gas enforcement staff—three field staff, one administrative support staff, and the supervisor (Mike Burton). There is also an additional staff member from the Financial Responsibility section in the department's Division of Fiscal Services who provides assistance on bonding requirements. In addition to handling permitting and operations issues, this staff is also responsible for administering the abandoned well program, which is a monumental task involving thousands of abandoned wells. See, e.g., TDEC, Div. of Geology, Oil & Gas Board, *Tennessee Abandon Well Report*, May 17, 1999, prepared by W.D. Goodwin, Inc., at 2 (identifying 1,901 known abandoned wells, and estimating 2,536 probable abandoned wells and 4,634 possible abandoned wells).

<sup>42</sup> State of Pennsylvania, *Governor's Marcellus Shale Advisory Commission Report*, July 22, 2011, "6.1 – Well Permit Fees and Staffing Increases," p. 65, available at <http://marcellus.psu.edu/resources/PDFs/MSACFinalReport.pdf>.

<sup>43</sup> In March 2012, the Pennsylvania legislature also approved an "impact fee" per hydraulic fracturing well drilled on the Marcellus shale that starts at \$50,000 and is indexed to the future cost of gas and age of the well. Penn. Consol. Stat., Tit. 58, § 2302, "Unconventional gas well fee."

<sup>44</sup> See Christopher B. Power, "West Virginia Enacts Comprehensive Horizontal Gas Wells Statute," *National Law Review*, Jan. 6, 2012, available at <http://www.natlawreview.com/article/west-virginia-enacts-comprehensive-horizontal-gas-wells-statute>.

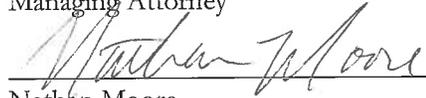
VI. Conclusion

We respectfully ask TDEC to consider these comments, as well as the TCWN comments, and, at a minimum, to revise its regulations to: (1) require meaningful pre- and post-drilling disclosure of the composition of fracturing fluid and the chemicals contained in the fluid; (2) require consultation with TWRA to avoid, minimize, and mitigate impacts on wildlife; (3) require that all oil and gas practices be at least as protective as API standards; and (4) realistically assess the costs of an effective regulatory program, and adjust its fees accordingly.

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