

Testimony of Christi Craddick

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Before The Committee on Natural Resources, Subcommittee on Energy and Mineral Resources

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Hearing: *Protecting States' Rights to Promote American Energy Security Act*

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Chairman Lamborn, ranking member Holt, and members of the Committee and Subcommittee:

Thank you for the opportunity to provide testimony in support of HR 2728 (Flores), the *Protecting States' Rights to Promote American Energy Security Act*, recognizing States' authority to regulate oil and gas operations and promote American energy security, development, and job creation.

Texas has successfully regulated oil and gas production for almost 100 years and knows better than the federal government how to both serve and protect the unique interests of our state. As Commissioner of the Railroad Commission of Texas (Commission and/or RRC), I am here today to provide my knowledge regarding the rules, regulations and practices the State of Texas and the Commission have in place to safely and effectively regulate oil and gas exploration and production, and specifically the energy industry method of hydraulic fracturing, or fracing.

Fracing has been a common industry practice in Texas for more than 60 years. After Stanolind Oil introduced fracing in 1949, Halliburton conducted the first two commercial fracturing treatments in Stephens County, Oklahoma, and Archer County, Texas. Through the '80s and '90s, horizontal drilling, another pioneering technology was developed in Texas by George P. Mitchell. This technique combined with fracing, has opened the door and allowed operators to economically extract natural gas and other hydrocarbons from shale rock formations.

As of December 2012, an estimated 2.5 million fracture treatments have been performed worldwide. It is estimated that approximately 60 percent of all wells drilled today are hydraulically fractured. Fracing not only increases a well's production rate, but it is credited with adding 9 billion

barrels (BBL) of oil and more than 700 trillion cubic feet (Tcf) of gas to U.S. reserves alone, which otherwise would have been too costly to develop.

Much of the immense growth in production related to fracing and horizontal drilling has occurred in Texas, where energy production is booming. The Commission issued 22,479 drilling permits in 2012, a number consistent with a steady increase in drilling permits in the state from 9,716 permits issued in 2002. Well completions increased from more than 9,900 in 2010 (<http://www.rrc.state.tx.us/data/drilling/drillingsummary/2010/annual2010.pdf>) to more than 15,000 in 2012 (<http://www.rrc.state.tx.us/data/drilling/drillingsummary/2012/annual2012.pdf>). Texas produces almost one third of total U.S. crude oil today. Currently, Texas' crude oil production averages 1.68 million barrels (MMbbl) per day. Natural gas production averages 19.31 billion cubic feet (Bcf) per day.

Because the energy industry in Texas is exceedingly active, it has quickly become the number one job creator in terms of jobs created and compensation. In 2012, there were a total of 427,761 oil and gas jobs in Texas in every sector of the oil and gas industry arena including drilling, extraction, distribution, refining, manufacturing, machinery and equipment operation, wholesale, transportation and support activities, with an average salary of about \$120,000 per year.

An active energy industry in Texas has also generated substantial revenue for our state coffers. In fiscal year 2012, the oil and gas industry paid \$12 billion in state taxes, up from \$9.25 billion in 2011 and \$7.4 billion in 2010. In the last fiscal year, oil and gas severance tax income from oil production was 43 percent higher than estimated at \$2.1 billion, and the natural gas production tax brought in \$1.5 billion, 38 percent higher than estimated. Severance taxes make up the state's Rainy Day Fund, which currently has reserves of approximately \$8 billion, and that number is projected to rise to \$11.8 billion by the end of the 2014-2015 biennium. Another \$3.6 billion was collected in property taxes from oil and gas interests in fiscal year 2012 and sales taxes totaled \$2.5 billion.

Not only is Texas the number one oil and gas producer in the United States with more than 298,000 active oil and gas wells

(<http://www.rrc.state.tx.us/data/wells/welldistribution/welldistribution062913.pdf>), the state has a stellar environmental and public safety record, while fostering a job-creating industry. The Commission is recognized as a world leader and serves as an example across the globe in developing workable regulation for the energy industry and for its leadership in ensuring that resource recovery operations meet or exceed environmental and safety compliance standards.

With experience comes knowledge, and the Commission has been regulating the oil and gas industry for more than 90 years, including oil and gas production, intrastate pipeline inspection and safety, utility rate cases pertaining to natural gas, and surface mining and reclamation oversight. While the Commission's headquarters is based in Austin, the agency has nine field offices throughout the state that work through inspections and case work in the field to ensure operators are adhering to our rules.

Railroad Commission rules have set the precedent in guiding energy production regulations throughout the world. It is the mission of the Commission to serve Texas by the stewardship of natural resources and the environment, concern for personal and community safety, and support of enhanced development and economic vitality for the benefit of Texans. The Commission has in place a successful and comprehensive regulatory framework to ensure that all oil and gas activities, including fracing, do not impact groundwater or surface water. Commission records do not indicate a single documented water contamination case associated with the process of fracing in Texas, and this is due to consistent and thoughtful regulation from within our state by regulators who know Texas best.

Texas' success in energy regulation has resonated throughout the world, driving many other nations' government officials to Texas to learn about our successful oversight processes. Last year, the agency's subject matter experts provided technical information on how the Commission regulates oil and gas exploration and production to dignitaries from Brazil, Turkmenistan, South Africa, Norway, China, Iraq, Italy, Canada, and Mexico. The Commission works to provide insight on processes in place that have allowed Texas to effectively oversee energy production for economic development while protecting the environment and public safety, so that others may replicate our state's successful model. As our agency has worked to continuously update and develop new rules and processes for effective regulation

of an ever-changing industry, regulators throughout the world have made efforts to learn from Texas' tried and true methods.

Many of those methods have become standard practice within Texas and across the globe. Any time a well is drilled in Texas, including an oil, gas or injection/disposal well, Commission rules require that surface casing in the well be set below the depth of usable quality water to protect the state's water resources. Because usable quality water levels vary throughout the state, the Commission's Groundwater Advisory Unit performs an essential function in determining specific groundwater protection depths for each new well.

The Commission's rules include strict well construction requirements that require several layers of steel casings and cement to protect groundwater. The first protection layer for usable quality groundwater in a well is the surface casing, a steel pipe that is encased in cement that reaches from the ground surface to below the deepest usable quality groundwater level. Surface casing acts as a protective sleeve through which deeper drilling occurs.

The second protection layer for groundwater is the production casing, a pipe placed in the wellbore to the well's total depth and permanently cemented in place. Some operators inject fracturing fluid in this casing. Depending on the fracturing pressure needed, other operators use a third protection layer by injecting fracturing fluid in the tubing string that conducts the fracturing fluid to the zone to be fractured and then produced.

For fracturing fluid to affect the usable quality water, a leak would have to escape several layers of casing protection and flow outside of the wellbore. For monitoring purposes, Commission rules require gauges for observation of these casings at the surface. If there is a problem down-hole, it is easily and quickly identified.

In addition to the Commission's strict well construction requirements and rigorous regulatory oversight, Texas is blessed with geology that aids in our water protection efforts. Depending on the shale,

fracing in Texas can typically occur a mile or more below aquifers, with many thousands of feet of isolating rock in between fresh water zones and the hydrocarbon-bearing zones that are hydraulically fractured.

For example, freshwater zones vary throughout the Barnett Shale region in North Texas, which can range from the surface to a depth of 2,000 feet. Before you get to the Barnett Shale formation, there is another 4,000 to 6,000 feet of isolating rock protecting the fresh water zones. The tight shale fracing that is occurring in the Barnett Shale is more than a mile deep at depths of between 6,000 and 7,500 feet.

In the Eagle Ford Shale in South Texas, the Carrizo Aquifer may be found from the surface to a 6,000 foot depth, while 3,000 to 8,000 feet of isolating layers of rock is found between the aquifer and the zone that is undergoing tight shale fracing at depths of between 8,000 and 15,000 feet (Note: These dimensions are not uniform throughout the Eagle Ford Shale). While there are some areas in Texas where operators drill to shallower depths and use small-volume hydraulic fracture stimulation, the Commission's new rules address any increased risk.

With Texas' experience in exploration and production, free market practices, and prime production conditions, the Commission has learned to proactively develop regulatory oversight, while allowing vast industry growth in innovation and increased production. In keeping pace with advancements in the energy industry, the Commission has spent the past year evaluating rules and processes to enhance our state's regulatory structure.

In February 2012, the Commission implemented one of the nation's most comprehensive chemical disclosure rules for fracing a well in Texas. As of Feb. 1, 2012, the Commission requires Texas oil and gas operators to disclose chemical ingredients and water volumes used in the fracing treatment of oil and gas wells on the FracFocus internet website hosted by the Ground Water Protection Council (GWPC) and the Interstate Oil and Gas Compact Commission (IOGCC) at: <http://fracfocus.org/>. Texas is one of the first states to require making this information accessible to the public.

In May 2013, the Commission amended its rules to update standards relating to the requirements for integrity testing of casing, cementing, drilling, well control, and well completion requirements. For

wells spudded on or after Jan.1 2014, operators in Texas will be required to: Adhere to new minimum standards for casing and cement to reflect best management practices already being used by most operators; Set minimum cement sheath thicknesses for various casing strings; Control annular gas migration; Test casing integrity throughout the drilling process; Isolate potential flow zones, zones with corrosive formation fluids, and zones being used for underground injection; Follow additional requirements for wells on which hydraulic fracturing treatment(s) will be conducted; and Receive Commission approval of any proposal to set surface casing to a depth of 3,500 feet or greater;

Recognizing concerns about water use, several companies have applied for, and the Commission has approved, recycling projects to reduce the amount of fresh water used for fracing statewide and specifically in South Texas, a result of increased development in the Eagle Ford Shale. In March of this year, the Commission amended its rules to remove regulatory roadblocks and encourage recycling of such production fluids. In April, the amended recycling rules became effective and were designed to encourage recycling and reduce the use of fresh water to continue operators' water conservation efforts during fracing operations.

By removing regulatory hurdles, the Commission fosters industry recycling efforts as operators continue to examine ways to reduce freshwater use when fracing wells. The new rules are designed to authorize non-commercial recycling under specified conditions if operators are recycling fluids on their own leases or transferring those fluids to another operator's lease for recycling. The new rules identify more clearly the Commission's commercial recycling permit application requirements and permit conditions. The Commission also adopted amendments to its commercial recycling rules. The revisions clarify the application requirements for commercial recycling operations for both solids and liquids and expand the two existing categories to five, to more accurately reflect the range of recycling practices currently used in the industry. The amendments establish a tiered approach for the reuse of treated fluid, including both authorized reuse of treated fluids in oil and gas operations and provisions for reusing the fluid for other non-oilfield related uses.

Through thoughtful processes and careful assessments, the Commission ensures that we have the sophistication to effectively regulate one of the most technologically advanced industries in the world. A recent case serves as an example to the differences in the Texas and federal process in assessing and efficiently and effectively regulating drilling. In 2010, EPA issued an endangerment order for southern Parker County even though the Railroad Commission had an active and ongoing investigation into whether Range Resources gas wells had contaminated water wells in the area.

After EPA issued an endangerment order, the Commission held an extensive evidentiary hearing regarding the matter to which EPA was invited but chose not to participate. The outcome of the hearing was that Range's gas wells were not the source of the natural gas in the water wells.

The primary difference between EPA findings and the Commission's findings is that the EPA relied solely on a comparison of isotope data from Barnett Shale production gas to natural gas that occurred in Mr. Lipsky's water well, whereas the Commission's findings were based on multiple lines of evidence (i.e., well integrity testing, microseismic data, an evaluation of local geology and other sources of natural gas, and testing of both production gas and gas in the bradenhead) that showed that Range's Barnett Shale gas wells were not causing contamination.

The mindset in Texas and federal processes in using science and data to effectively assess and regulate oil and gas exploration and production activities appear to be vastly different in this case. Moreover, it cannot be emphasized enough that EPA has since vacated its order against Range. A timeline of EPA and Commission actions in the Range Investigation is set out in the attached Appendix A.

Like all forms of energy production, fracking entails risks, but offers the prospect of economic and environmental benefits when properly regulated. As the production of energy through fracking continues, we must continue to study this technology and ensure that it is done safely. Texas and state regulatory bodies alike are best fitted for the task of overseeing the safe production of their resources within their boundaries for a number of reasons.

Texas and other energy producing states are quickly adapting and familiarizing their communities with oil and gas exploration and production processes. We are working to strengthen shale gas regulations to tighten well construction and waste disposal standards and requiring disclosure of fracking fluid ingredients, bringing together all interested parties, industry and environmental groups, in the process.

Texas has developed a regulatory system that fits our state's varying drilling conditions throughout different regions. A one size fits all model does not work in Texas, as different rules for different states are most effective in adhering to differing geography, geology, and environments. Operators will use different drilling specifications and methods, depending upon the location of the well site; and Texas' rules reflect these considerations. Regulatory bodies throughout the U.S. have overseen oil and gas development in their respective states for decades, and they know their issues well.

Not only are states more familiar with the intricacies of the geology in which their operators are drilling, but the majority of both the benefits and costs of fracking fall on states and local communities. Texas has experienced a direct gain from added jobs and tax revenue; and also properly manages pollution risks (the Commission does not have jurisdiction over traffic & noise). Therefore, the Commission is in the best position to figure out how best to balance the positive and potential negative facets of fracking.

Individual regulatory bodies are balancing benefits and risks in their own ways. We should continue to let individual regulatory bodies devise local solutions to local conditions. As our nation nears energy independence due to increased domestic production, it is important now more so than ever that energy producing states are not over-burdened by federal regulations that may stifle production growth.

While every regulatory body has their own model of how to regulate energy production within their borders, Texas too has developed its own case study on how to best regulate oil and gas exploration and production. Texas energy regulation is based on rules in contrast to permit- or study- driven regulation. Texas regulation is based in free market principles guided by rules and processes that allow companies to drill, so long as rules are followed. The cost to drill a well in Texas depending on

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geological location of the drill site and techniques used can be anywhere from \$1 million to \$5 million.

Operators invest vast amounts of money in time in drilling operations that they hope to see successful.

Furthermore, Texas drilling permits are issued somewhere between 2 – 5 days. Unnecessary, cumbersome federal oversight will slow Texas' current efficient processes. While the oil and gas industry is one of the top economic drivers in Texas, we know that efficient, consistent and predictable regulation within the energy industry is the key to our state's economic success, and the success of domestic U.S. energy production.

Thank you again, Chairman Lamborn and ranking member Holt, for the opportunity to testify before your Subcommittee and for your attention to this legislation. The Railroad Commission of Texas applauds Congressman Flores for introducing this bill and the members of this sub-committee for their interest in considering it. I would be happy to answer any questions you might have regarding my testimony.

Sincerely,

Christi Craddick
Commissioner
Railroad Commission of Texas

Appendix A

Timeline of EPA and Commission Actions in the Range Investigation

August 6, 2010: Water well owner, Mr. Steven Lipsky, filed a complaint of natural gas in a domestic water well. In response to the complaint, Commission District 7B (Abilene) staff initiated an investigation that included testing the domestic water well for presence of oil field contamination and inspecting the nearby Range gas production wells [Butler Unit Well No. 1H (Butler Well) and Teal Unit Well No 1H (Teal Well) in the Newark, East (Barnett Shale) Field, Hood County, Texas].

August 17, 2010: U.S. EPA, Region 6, Water Enforcement Branch first contacted the RRC Abilene District Office, which agreed to carbon copy EPA on all complaint correspondence.

August 26, 2010: Mr. Lipsky advised RRC Abilene District Office he intended to disconnect his water well from the house.

October 2010: EPA technical staff contacted Abilene District Office staff requesting to discuss plans to collect gas samples from the Lipsky water well and the Butler Well. EPA staff informed District Office staff that the EPA was considering issuing an endangerment order; however, EPA did not issue formal communication on this point to the Abilene office or RRC staff in Austin.

October 21, 2010: In a phone conversation, EPA technical staff informed RRC staff that EPA planned to collect a gas sample from the Lipsky well and a gas sample from the production casing of the Range production wells. RRC staff recommended that EPA also sample the bradenhead gas of the Range production wells, but EPA staff declined the recommendation.

October 26, 2010: EPA staff collected several samples from the Range production site including gas samples and produced water samples. RRC staff witnessed the collection of the samples. Range also collected samples of gas, including bradenhead gas. During discussion among the parties present about previous environmental investigations, RRC was informed that air monitors had been placed at various locations in the Lipsky home. However, no specific date of placement was noted.

November 23, 2010: EPA staff emailed analytical results to RRC staff and invited RRC staff to a meeting with Range scheduled for December 2, 2010.

December 1, 2010: EPA technical staff contacted RRC technical staff to advise that the meeting with Range will not occur because Range has declined the invitation. EPA staff also notified RRC staff that EPA planned to issue an endangerment order under Section 1431 of the Safe Drinking Water Act [42 U.S.C. § 300(i)(a)], based on recent isotope data that it believed connects Range's operations to gas in the Lipsky well.

December 2, 2010: EPA staff calls the RRC to share same information. RRC technical staff and EPA technical staff discuss the endangerment order. EPA staff read a statement from the draft endangerment order indicating that "RRC has not taken action to date." RRC staff disagreed with that statement and suggested the following alternate statement "*although RRC is investigating the complaint, the RRC has not taken enforcement action to date.*" EPA staff also said that it would issue a press release, not to occur before the following Monday, December 6, 2010.

December 3, 2010: EPA regional administrator contacted RRC chairman to advise of the planned endangerment order. EPA called RRC staff to ask about other occurrences of gas in shallow sands. RRC returned call and advised of two other complaints in area. EPA requested copies of the files. RRC staff began gathering information on other water well complaints, per EPA request. Range sends a letter to RRC agreeing to take additional actions. RRC staff notifies EPA staff of the Dec. 3 letter from Range and emails a PDF of the letter to EPA staff.

December 6, 2010: EPA sent the following email to RRC staff: "As you are aware, the EPA is concerned about the safety of the private drinking water wells in Parker and Hood County that are near the Butler and Teal gas production wells. The EPA wants to make sure that all of the drinking water wells in this area are safe and not subject to methane contamination. Does the Railroad Commission of Texas have plans to sample these wells in the near future?"

December 7, 2010: RRC staff replied to EPA's December 6 email, and advised EPA staff that the RRC has an ongoing investigation and is gathering information about occurrences of gas in other water wells in the area. RRC sends PDF's of two other water well complaints in the area to EPA staff.

December 7, 2010: EPA issues the Emergency Administrative Order (Docket No. SDWA-06-2011-1208) against Range.

December 8, 2010: RRC issues a Notice of Hearing to consider whether operation of the Range Production Company Butler Unit Well No. 1H and Teal Unit Well No. 1H in the Newark, East (Barnett Shale) Field, Hood County, Texas are causing or contributing to Contamination of Certain Domestic Water Wells in Parker County, Texas.

January 19-20, 2011: RRC hearings examiners hold a 2-day hearing in Austin. Appearances were made by Range, RRC staff, Enervest Operating Company, and the Texas Alliance of Energy Producers. Neither EPA nor the owners of the two water wells participated in the hearing.

March 22, 2011: Commissioners Elizabeth Ames Jones, Michael Williams and David Porter signed a Final Order, which stated that, based on the evidence presented at the Hearing, the examiners concluded, and the Commissioners agreed, that gas in the water wells is from the Strawn Formation, which is in direct communication with the Cretaceous aquifer in which the water wells are completed. There was no evidence to indicate that either natural gas production well is the source of the gas in the water wells. This conclusion was supported by the following evidence found by the Commission hearing examiners:

- The appropriate geochemical parameters for fingerprinting to distinguish Strawn gas of Pennsylvania age from Barnett Shale gas of Mississippian age are nitrogen and carbon dioxide, not carbon. Gas from Pennsylvanian age rock, including Strawn, has higher nitrogen concentration and lower carbon dioxide concentration than Barnett Shale gas. Gas found in the water wells does not match the nitrogen fingerprint of Barnett Shale gas. The gas found in the water wells matches Pennsylvanian gas.

- Bradenhead gas samples from both water wells do not match Barnett Shale gas, confirming that gas is not migrating up the wellbores and that the Barnett Shale producing interval in the Butler and Teal wells is properly isolated.
- 3-dimensional seismic data indicates no evidence of faulting in the area of the water wells.
- Microseismic data available for more than 320 fracture stimulations in Parker County indicated a maximum fracture height of approximately 400 feet, meaning that almost one mile of rock exists between the highest fracture and the shallow groundwater aquifer.