
Progress Report

SEAB Recommendations on Unconventional Resource Development

Introduction

Recent Secretary of Energy Advisory Board (SEAB) reports provide important frames of reference for stimulating actions that can ensure the development of U.S. oil and natural gas is safe and environmentally responsible. This overview outlines near term actions being taken by the U.S. Department of Energy (DOE) in response to the SEAB's March 2014 report on FracFocus 2.0, and also highlights progress resulting from prior SEAB reports on Shale Gas Production released in 2011.¹ Many federal and state energy policies and supporting initiatives are consistent with the recommendations in these reports. DOE recognizes, however, that further actions by industry, government, and other stakeholders will be necessary to fully realize the potential of the nation's oil and natural gas resources to provide secure American-made energy, jobs, a stronger economy, and a clean environment.

The United States has abundant oil and natural gas resources with the potential to meet the needs of American consumers and fuel the economy for decades to come. Realizing the benefits of this remarkable endowment requires that oil and natural gas be developed in ways that are safe and environmentally responsible. The oil and natural gas industry has a history of continuous technological innovation which in 2013 resulted in natural gas being the largest domestically produced energy resource for the third year in a row and together with other fossil fuels (coal, oil, and hydrocarbon gas liquids) accounting for more than three quarters of U.S. energy production.² This history of technological innovation provides a strong foundation for enabling future oil and natural gas operations to become progressively smarter, cleaner, and more protective of the environment.

¹ The SEAB reports are available at www.shalegas.energy.gov and <http://energy.gov/seab/secretary-energy-advisory-board-seab-task-force-fracfocus-20>.

² U.S. Energy Information Administration

Realizing Promise Requires Responsible Action

There is resounding similarity among reports. Realizing the potential of abundant oil and natural gas resources to enhance the nation's energy, economic, and environmental security will hinge on safe and responsible development.

- SEAB Shale Gas Production Reports 2011
- National Petroleum Council Prudent Development Report 2011
- Obama Administration Blueprint for a Secure Energy Future 2011
- International Energy Agency Golden Rules for a Golden Age of Gas 2012

Oil and natural gas resources are located in diverse geologic and environmental settings. Communities in which oil and natural gas are produced must have confidence that the risks of oil and gas development are being properly managed and that air, water, and land resources will not be compromised. Increased transparency and public access to information about the risks and the benefits of oil and natural gas operations are important keys for furthering collaboration and enabling all interested parties to make informed decisions.

SEAB FracFocus Review

In November 2013, Energy Secretary Ernest Moniz charged the SEAB to establish a Task Force to review FracFocus 2.0, the national on-line registry for the public disclosure of chemical constituents in hydraulic fracturing fluids used in unconventional oil and natural gas production. The charge responded to a request from Senator Ron Wyden, former Chair of the Senate Energy and Natural Resources Committee, for a FracFocus review. Secretary Moniz turned to the SEAB because a Subcommittee of the Board had undertaken a study to identify measures to reduce the environmental impacts of shale gas production in 2011. Former Energy Secretary Steven Chu had championed the Subcommittee's establishment as part of President Obama's Blueprint for a Secure Energy Future.

In March 2014, the SEAB approved the final report of the Task Force on FracFocus 2.0. The SEAB's FracFocus report acknowledges the important role that FracFocus has served in facilitating public disclosure of the chemical composition of fracturing fluid. A central finding of the SEAB's 2011 Shale Gas report, reiterated in the SEAB's 2014 FracFocus report, is "the importance of a process of continued improvement in various aspects of shale gas production that relies on best practices and is tied to measurement and disclosure" in order to achieve progressively lower levels of environmental impact.

DOE's Role

The Ground Water Protection Council (GWPC) and the Interstate Oil and Gas Compact Commission (IOGCC), two state organizations dedicated to resource conservation and environmental protection, operate the FracFocus registry. In the United States, states have primary roles in establishing and implementing oil and natural gas-related policy and regulation.

DOE's Office of Fossil Energy (FE) is a funding sponsor of FracFocus, as well as the GWPC's Risk Based Data Management System (RBDMS). Several of the SEAB's 2011 recommendations were directed at increasing transparency and disclosure in order to support state and federal regulatory oversight and to meet public concerns about hydraulic fracturing. The SEAB specifically called on DOE to support the then new FracFocus website and RBDMS, so that similar projects might be expanded to other aspects of shale gas and oil development.

FracFocus is one tool used by states in the oversight of oil and natural gas development. Also vital to these efforts, RBDMS is an integrated data management structure with interactive modules for state regulatory program decision making and is used by many oil and natural gas producing states. Many recommendations in the SEAB's 2014 report can be addressed through either FracFocus or RBDMS improvements, or a combination of both.

DOE FE investments in FracFocus and RBDMS support state and federal efforts to ensure oil and natural gas development is safe and environmentally responsible, and President Obama's all-of-the-above energy strategy for strengthening America's energy security and providing for continued economic growth. The GWPC is also partnering with DOE's Energy Information Administration (EIA) to increase public access to well level data via a National Oil and Gas Information Gateway. The SEAB viewed RBDMS and collaboration between the GWPC and EIA as beneficial to increase public access to information about the production of shale gas and other domestic oil and natural gas resources and to identify further opportunities for improved data management.

Progress on SEAB 2011 Shale Gas Recommendations

To reduce and better manage the risks of shale gas operations, the SEAB's 2011 Shale Gas reports, released as a 90-day interim report in August 2011 and a final report in November 2011, included recommendations on 9 topics.

<i>Public information about shale gas operations</i>	<i>Communication among state and federal regulators</i>	<i>Air quality</i>
<i>Water quality</i>	<i>Hydraulic fracturing fluid</i>	<i>Diesel fuel use</i>
<i>Impacts on communities, land use, wildlife and ecologies</i>	<i>Organizing for best practices</i>	<i>Research and development</i>

A central finding of the SEAB's 2011 Shale Gas reports was "the importance of a process of continued improvement in various aspects of shale gas production that relies on best practices and is tied to measurement and disclosure" in order to achieve progressively lower levels of environmental impact.

There are many reasons to be optimistic that progressively lower levels of environmental impact can be achieved. Among those cited by the SEAB were:

- State and federal regulators and companies are already deeply involved in environmental management.
- Industry's pursuit of more efficient operations often yields environmental as well as economic benefits, including waste minimization, less water usage, improved resource recovery, and a smaller operating footprint.
- Early success in implementing some recommendations may stimulate greater effort on other recommendations which require greater time and effort for progress.

Themes in SEAB's 2011 Reports

Leadership. Industry and government being focused on safety and environmental performance, and establishing a culture of continuous improvement.

Engagement. Embracing dialogue, cooperation, and new partnerships or mechanisms among industry, regulators, and affected communities and public interest groups to affect change and increase public confidence that shale gas production can be developed safely and with less environmental and community impact.

Best Practices. Identifying today's best practices and evolving these as technology changes, operational experience increases, and knowledge of environmental effects and effective mitigation grows.

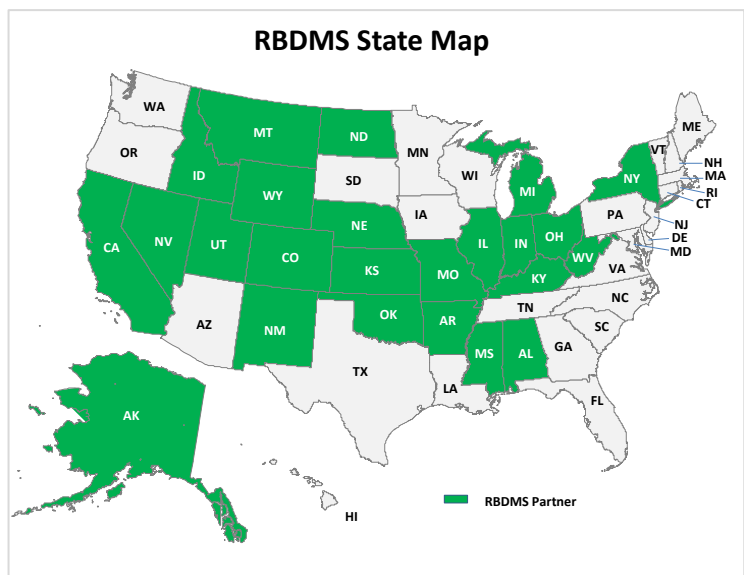
Effective Regulation. Regulators sharing data and best practices to inform decision making, and evolving regulatory strategies to keep pace with expanded production and changes in technology and field practice.

Regional Diversity. Adapting engineering practices and regulatory approaches to address regional diversity in geology, environment settings, and operational characteristics.

Much progress has been made by industry, government, and other stakeholders towards implementing these 2011 recommendations. Highlights are described below.

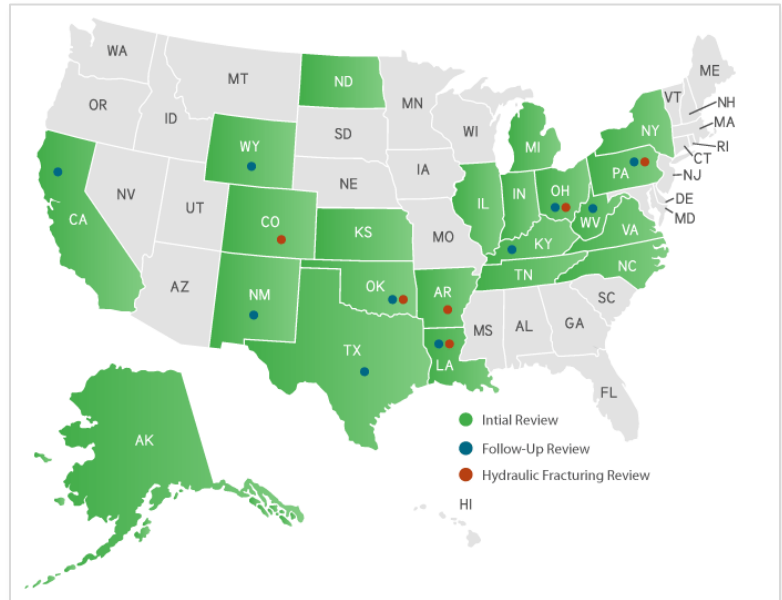
Improve public information about shale gas operations

- Recognizing the growing contribution of U.S. and global shale gas and oil resources to future energy supplies, the EIA has worked to make more shale-related information available to the public at www.eia.energy.gov.
- EIA web pages on natural gas provide easy pathways to topical reports on *Drilling Productivity* and *Natural Gas Issues and Trends*, in-depth analyses, data on current and projected prices, exploration, production, consumption, and more.³
- The *National Oil and Gas Gateway* that EIA and the GWPC are developing will provide a centralized repository of oil and natural gas well-level data collected by participating states. The *Gateway* will streamline access to state data, provide a more complete and time series dataset for basin-wide and interstate analysis, and improve analysis of emerging geologic plays and technology.
- DOE FE continues to support enhancements to GWPC's *RBDMS*, used now by 24 states to manage oil and natural gas regulatory data. Data mining and other capabilities of this mission critical tool have enabled states to increase the availability of public information on shale operations.



³ See www.eia.gov/naturalgas.

- STRONGER, a non-profit multi-stakeholder organization formed in 1999 to reinvigorate and carry forward the state review process begun cooperatively in 1988 by the U.S. Environmental Protection Agency (EPA) and the IOGCC, has expanded its guidelines and has continued to conduct reviews of state oil and natural gas regulatory programs with funding assistance from DOE and others. A comprehensive review of Pennsylvania’s program was conducted in 2013. Guidelines on air quality were added in 2014 and efforts are currently underway to develop guidelines for fluids reuse and recycling. STRONGER has successfully reviewed 22 state regulatory programs, representing over 94% of domestic onshore oil and gas production. Ten of these states have volunteered for at least one follow-up review, with the results indicating that 76% of recommendations from the initial review had been implemented.⁴



Improve communication among state and federal regulators

- DOE supports *States First*. This states-led initiative is being championed by the IOGCC and GWPC to recognize states as leaders and innovators in oil and natural gas regulation and to facilitate collaboration and communication on the very best and innovative practices, procedures, and protocols among states. *States First* also promotes states’ usage of FracFocus for chemical disclosure. As part of *the State Oil and Gas Regulatory Exchange*, a key component of *States First*, DOE’s National Energy Technology Laboratory (NETL) is assisting states through targeted research and technology transfer.

Improve air quality

- Actions are being taken on many fronts targeted to reduce methane emissions.
 - ✓ As part of the Administration’s 2013 *Climate Action Plan*, a comprehensive *Interagency Methane Strategy* is being developed involving EPA and the Departments of Interior, Labor, Agriculture, and Transportation. Secretary Moniz, along with senior White House officials, hosted a suite of roundtables in early 2014 to engage stakeholders. Initiatives announced by DOE in July 2014 focused on reducing methane emissions included efficiency standards for natural gas, advanced natural gas system manufacturing research, cost recovery incentives for

⁴ Available at www.strongerinc.org

modernizing natural gas infrastructure, and partnering with the National Association of State Regulatory Utility Commissioners to accelerate investments for infrastructure modernization and repairs to natural gas distribution networks.⁵

- ✓ EPA New Source Performance Standards for hydraulic fracturing will require “green completion” technology by 2015.
 - ✓ DOE’s oil and natural gas research program proposed a number of methane emissions reduction programs in 2013.
 - ✓ DOE’s National Energy Technology Laboratory is leading an inter-lab working group to share expertise on greenhouse gas lifecycle emissions analysis.
 - ✓ The Environmental Defense Fund (EDF), in cooperation with industry, academia, and others, is leading an array of studies to better define methane emissions along the natural gas value chain.
- In 2014, the Environmental Council of States (ECOS) established a *Shale Gas Caucus* to further information exchange and the sharing of best practices among state environmental agency regulators. The Caucus’ first initiative is focused on methane and volatile organic compounds (VOC's) and partners include DOE, EPA, EDF, and America’s Natural Gas Alliance. ECOS is the national association of state and territorial environmental agency leaders dedicated to improving the capability of states to protect and improve human health and the environment of the United States.

Protect water quality

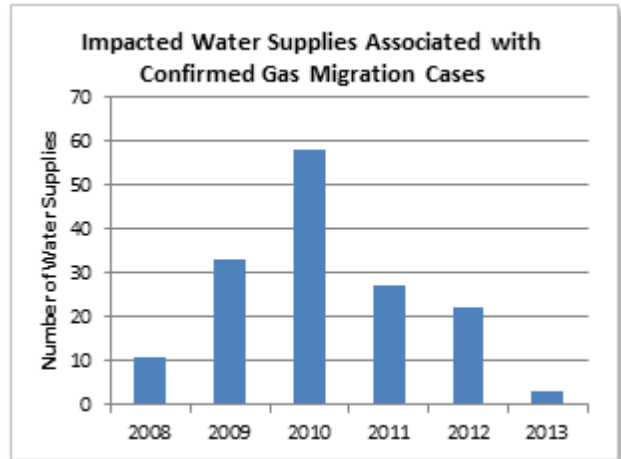
- State and federal regulatory programs to conserve and protect water resources continue to evolve. The GWPC's report (2014 edition) on *State Regulations Designed to Protect Water Quality* catalogs recent changes in state regulations on topics such as permitting, well construction, hydraulic fracturing, well plugging, waste handling, and spill reporting.
- Federal research investments have helped to catalyze industry interest in systems and life-cycle approaches to water management. For example, DOE FE funding enabled the Barnett Shale Water Conservation and Management Committee⁶ to study water reuse and management technologies in gas drilling operations in the Barnett shales of the Fort Worth basin.
- The DOE National Energy Technology Laboratory (NETL) is releasing a technical report, *An Evaluation of Fracture Growth and Gas/Fluid Migration as Horizontal Marcellus Shale Gas Wells are Hydraulically Fractured in Greene County, Pennsylvania*, detailing the results of a study they designed to monitor the vertical movement of gas and liquids, during a hydraulic fracturing operation in the Marcellus Shale of Greene County, PA. The study involved the collection of microseismic and other data prior to, during, and after hydraulic fracturing. The data collected showed no evidence of vertical movement to the overlying gas strata, which was ~1500

⁵ For further information, see <http://www.energy.gov/articles/department-energy-announces-steps-help-modernize-natural-gas-infrastructure>.

⁶ See <http://barnettshalewater.org/>. This industry organization seeks to develop best management practices to ensure that water is managed in an efficient and responsible manner.

feet below the groundwater. The study also included production data and analysis of tracers in gas and brine collected from the overlying gas unit for over two years.

- Wellbore cement integrity is paramount to safe, successful oil and natural gas drilling. DOE’s NETL is working with industry experts to further technology research and development in cement design, placement, and long-term integrity.
- Effective engineering and construction of oil and gas wells reduces the potential risk that natural gas may escape from the wellbore and into subsurface geologic strata or groundwater resources. If natural gas does escape, states will require the responsible operator to correct or mitigate the situation. The Pennsylvania Department of Environmental Protection (DEP) in early 2014 released its *2013 Oil and Gas Annual Report*⁷ which shows that the number of impacted water supplies associated with confirmed gas migration cases as a result of hydrocarbon exploration and production activities were reduced by 95% over the years 2010 to 2013. The report was created to provide information and insight into how this state oil and natural gas regulatory agency is fulfilling its missions to protect Pennsylvania’s air, land, and water from pollution.

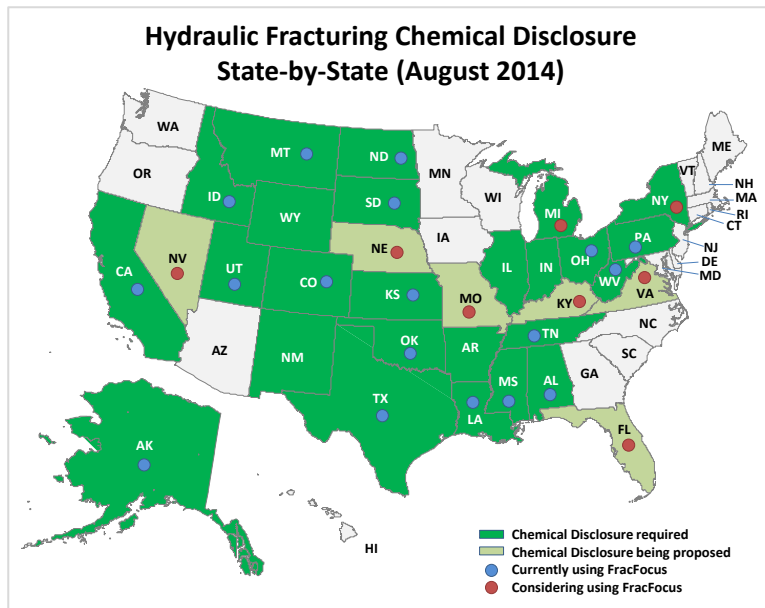


Source: 2013 Oil and Gas Annual Report, Pennsylvania Department of Environmental Protection Office of Oil and Gas Management.

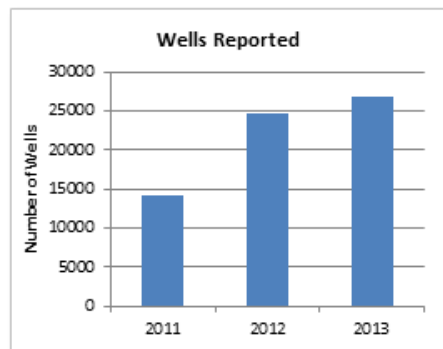
⁷ Available at www.portal.state.pa.us/portal/server.pt/community/annual_report/21786

Disclosure of fracturing fluid composition

- FracFocus, the national on-line registry for the public disclosure of the chemical composition of hydraulic fracturing fluids, is now in its third year of operation. Over this time, the geographic footprint of disclosure has rapidly grown and FracFocus as a disclosure tool continues to evolve. Originally designed for voluntary reporting by industry, FracFocus is now used in numerous states for regulatory reporting.



- Significant progress has been made in the number of wells being reported annually in FracFocus. Based on Baker Hughes data, about 35,700 wells were drilled on land nationwide in 2013. Of these wells, 25,700 (72%) were reported to FracFocus. The upward trend in FracFocus reporting is expected to continue. Over 70,000 well reports are now available on the registry website.⁸



Source: FracFocus

Chemical Disclosure and FracFocus Gain Wide Acceptance

2010 WY is the first state to require chemical disclosure.

2011 **FracFocus 1.0** is launched by the GWPC and IOGCC. Six states require chemical disclosure.

2013 **FracFocus 2.0** goes live with enhanced user input and viewing features.

Disclosure registries, modelled after *FracFocus* are deployed in Canada and Europe.

BLM proposes the use of *FracFocus* for disclosure reporting on federal and Indian trust land.

2014 *FracFocus* gains ground across the U.S. for disclosure reporting. By February 2014, over 20 states require chemical disclosure and 15 require reporting on *FracFocus*.

SEAB FracFocus Review is completed in March 2014.

States and DOE initiate plans in April 2014 for **FracFocus 3.0** with enhancements based on SEAB recommendations.

By August 2014, 25 states require chemical disclosure and 18 require reporting on *FracFocus*. Six additional states are considering chemical disclosure requirements and eight are considering *FracFocus* mandates.

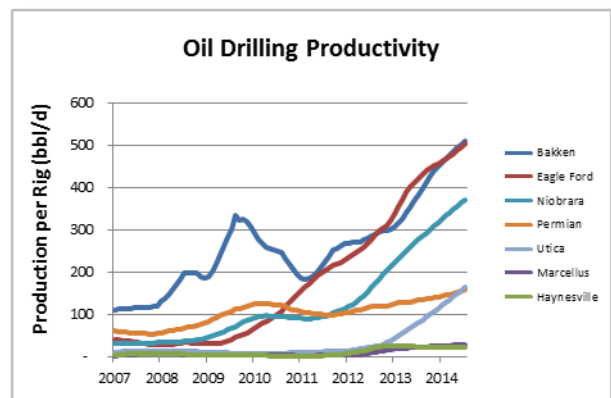
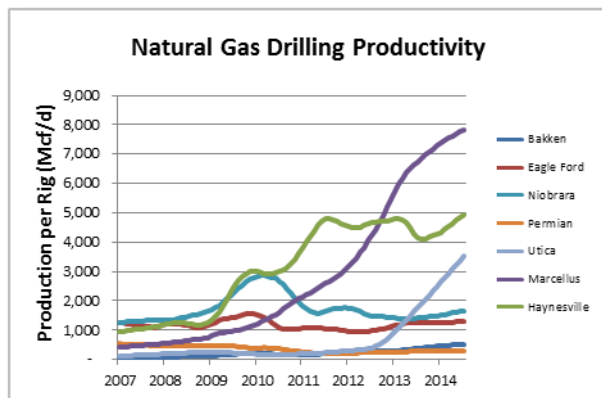
⁸ See www.fracfocus.org.

Eliminate the use of diesel fuel in hydraulic fracturing

- EPA issued regulatory permitting guidance on the use of diesel fuel in hydraulic fracturing operations in July 2013. The guidance clarifies federal jurisdiction, Class II underground injection control (UIC) program requirements, and defines the statutory term “diesel fuel.” An EPA review of FracFocus data showed only 18 of 12,000 well reports filed between July 2013 and January 2014 listed a diesel product. Through the *Gateway* project EIA will be able to facilitate the transfer of the state data to EPA for the national UIC program.

Manage short-term and cumulative impacts on communities, land use, wildlife, and ecologies

- Growth in U.S. hydrocarbon production from shale resources is being driven by drilling efficiency, as reported by EIA in 2013 and 2014.⁹ The productivity of oil and natural gas wells is increasing in many geologic basins across the nation due to the increasing precision and efficiency of horizontal drilling and hydraulic fracturing in oil and natural gas extraction. Many resource-producing basins are experiencing an increasing yield over time in either oil or natural gas. Pad drilling techniques allow rig operators to drill groups of wells with reduced rig movements. This widely adopted practice increases oil/gas productivity and reduces environmental impact.



Source: EIA and DrillingInfo

Organize for best practice

- To assist governors in their efforts at responsible shale energy development, the National Governors Association Center for Best Practices established a State Learning Network on Shale Energy Development in 2013. The initiative provides governors and their advisors with a forum to learn about the latest scientific, environmental, and technology information regarding hydraulic fracturing and other topics and to discuss state policy designs that effectively balance environmental, social, and economic considerations.

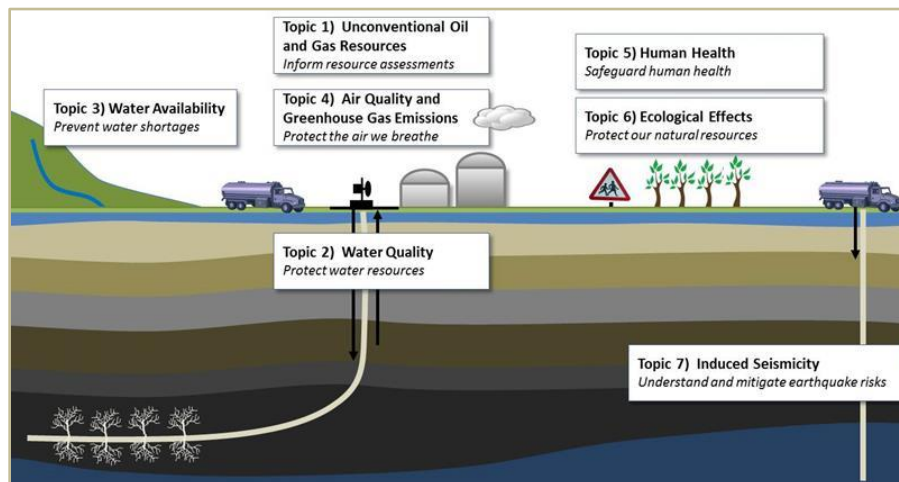
⁹ See <http://www.eia.gov/petroleum/drilling/>. In 2013, EIA published its first Drilling Productivity Report that estimates changes in oil and gas production in six key fields based on the number of operational drilling rigs, estimated drilling productivity, and other factors.

- Industry-led regional Centers of Excellence are emerging, and many companies engaged in shale development have adopted environmental performance standards. Academic institutions have also expanded research and public outreach.¹⁰
- To support natural gas sustainability, the Mitchell Foundation and Aspen Institute have programs underway to support emerging regulatory, industry, community, and academic efforts to reduce the negative environmental and community impacts of shale energy development while capturing the energy, environmental, and economic benefits of the fuel. Ongoing activities include collaborative efforts to modernize Texas regulations and policies, with emphasis on air, water, and well bore integrity.

Address research and development needs

- In 2012, DOE’s Office of Fossil Energy refocused its oil and natural gas research program to target increasing understanding and mitigation of environmental risks associated with developing unconventional oil and natural gas resources.
- DOE, EPA, and the Department of the Interior, through a *Federal Multiagency Collaboration on Unconventional Oil and Natural Gas Research Strategy* initiated by an April 2012 Executive Order, are coordinating research efforts to address high-priority challenges related to prudent resource development. Each of these agencies has expertise and core competencies that can influence the effective implementation of needed research. Because these core competencies overlap in some areas, emphasis is being placed on a complementary approach that avoids duplication and takes advantages of inherent strengths.

The *Strategy for Research and Development* released in July 2014 to support this multiagency effort identifies seven broad topic areas of research: 1) Understanding the scale and nature of U.S. unconventional oil and natural gas, 2) Water quality, 3) Water availability, 4) Air quality and greenhouse gas emissions, 5) Effects on human health, 6) Ecological effects, and 7) Induced seismicity.¹¹



¹⁰ Center for Sustainable Development, www.sustainable shale.org; Marcellus Shale Coalition, www.marcelluscoalition.org; and others.

¹¹ *Federal Multiagency Collaboration on Unconventional Oil and Gas Research: A Strategy for Research and Development*, available at <http://unconventional.energy.gov/>.

Progress on SEAB 2014 FracFocus 2.0 Recommendations

The SEAB's 2014 report called on DOE and states to improve the effectiveness of FracFocus disclosure and its usefulness for regulators, operating companies, and the public. Recommendations from the report and actions being undertaken by DOE are highlighted below.

SEAB 2014 FracFocus 2.0 Recommendations and Actions Summary

SEAB Recommendations	DOE Assessment and Actions
1. Assess the accuracy of well data disclosed on FracFocus	
<ul style="list-style-type: none">▪ Examine the data entry workflow and structure and simplify to reduce the probability of data entry errors.▪ Improve the quality of the data entered into the system, especially the accuracy and completeness of reported Chemical Abstract Service (CAS) numbers (unique and universal identifier of individual chemicals). Expand and improve the current automatic validation system.▪ Report errors discovered in company submissions to the company and indicate on the website.	<ul style="list-style-type: none">▪ Systems Audit. The GWPC and IOGCC, in partnership with DOE, have initiated a Systems Audit of FracFocus to identify and pursue actions that can enhance data accuracy. There are 6,900 trade names for materials used in fracturing with 5,100 ingredient names with 1,700 distinct CAS numbers. Improvements in software design, including automated error checking, can prevent erroneous reporting. Standardizing CAS numbers used by all parties in the industry will be a priority.▪ Funding and technical assistance for conducting the audit will be provided by DOE FE and EIA. EIA's focus will include best practices for quality assurance and control. Release of FracFocus 3.0 is targeted for late 2015. Better quality control will improve the accuracy of FracFocus data, including CAS numbers.
<ul style="list-style-type: none">▪ Audit operator and service company field records to determine the accuracy with FracFocus data entry, considering sample size and diversity and other factors such as trade secret claims.	<ul style="list-style-type: none">▪ State Regulatory Oversight. Eighteen oil and natural gas producing states currently require the use of FracFocus for reporting disclosure by statute and/or regulation. It is important to note that inaccurate reporting is potentially a compliance violation. Further, states have the responsibility to monitor and enforce their own requirements.▪ DOE is working with the GWPC to improve linkages between FracFocus and state regulatory data systems to enable more efficient data transfer and analysis.

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- Include information about the water used as a base fluid (e.g., fresh water vs. recycled fracturing fluid).
 - **FracFocus and RBDMS Improvements.** FracFocus is the only central repository for data on water use associated the hydraulic fracturing, but does not fully reflect trends within industry towards increased water reuse and recycling, or the interests that some states have in more easily tracking water by source and disposition.
 - DOE FE is partnering with states through the GWPC and IOGCC to upgrade FracFocus to shed more light on industry’s water needs, impacts, and management practices.
 - Efforts are underway to accelerate the deployment of RBDMS Water Tracker in state regulatory data systems.
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- States should be attentive to ensure compliance with more specific state disclosure requirements, especially where FracFocus requires less or different information.
 - **State Regulatory Oversight.** DOE supports actions that can improve regulatory oversight. DOE FE is partnering with states through the GWPC to develop and deploy improvements to RBDMS that will expand the capability of states to more efficiently store and analyze data for inspection and enforcement, e.g., enhancements to the RBDMS Inspection and RBDMS Environment modules.
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2. Adopt full disclosure with few, if any, trade secret exceptions

- No trade secret disclaimers unless documented and attested as done in Wyoming and Arkansas.
 - Report the complete list of chemicals by their CAS numbers and quantities added.
 - Report a complete list of products without linking the list of chemicals (“systems approach”).
 - **Stakeholder Engagement.** DOE is pursuing efforts to build consensus around enhancements to FracFocus that can increase transparency and encourage continued innovation using forums such as the GWPC’s multi-stakeholder FracFocus liaison group.
 - DOE will seek ways to encourage industry leadership to increase transparency about hydraulic fracturing, as well as other aspects of shale energy operations.
 - **Systems Approach.** DOE, GWPC, and IOGCC are exploring the extent to which the systems approach can be adopted as standard practice.
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3. Establish standards for trade secret exemptions

- DOE FE should assemble accurate data about the nature and extent of trade secrecy claims across chemicals, states, operators, suppliers, and time, within four to six months.
 - **Baseline Data.** DOE initiated a project in 2014 to assemble data on the nature and extent of trade secret claims, including fluids technology trends. DOE has engaged FracFocus stakeholders to broaden support for increased transparency and clarify the potential linkages of trade secrets to well productivity and economic competitiveness. This effort is ongoing.
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- State and federal regulators should establish a standard for claiming the exemption across the country using the State Review of Oil and Natural Gas Environmental Regulations (STRONGER) mechanism. State and federal regulators should establish compliance of trade secret claims and challenge mechanisms, once a procedure is put in place.
 - **Standards.** DOE will engage the STRONGER Board to clarify how the organization perceives its role, understands existing state requirements and identifies actions. The *States First* initiative will be explored as a venue for securing broad agreement on these actions.

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- Coordinate with the U.S. Environmental Protection Agency and the Bureau of Land Management (BLM) within the U.S. Department of Interior.
 - **Interagency Coordination.** DOE will update BLM and EPA on actions taken by the GWPC, IOGCC, and DOE to improve FracFocus 2.0. Such dialogue can support BLM and EPA efforts to ensure that federal regulations do not duplicate state regulations.
 - BLM in May 2013 issued a revised rule to regulate hydraulic fracturing on federal and Indian trust land which includes requirements for the use of FracFocus; a final rule is pending.
 - EPA in May 2014 issued an advanced notice of proposed rulemaking under the Toxics Substances Control Act seeking public comment on the information that should be reported or disclosed for hydraulic fracturing chemical substances and mixtures and the mechanism for obtaining this information such as regulatory, voluntary, third party certification, and/or incentives for disclosure of information.

4. Establish a policy for data custody, management, security, storage, and retention

- Implement standards to protect against unauthorized alteration or deletion of data, long-term data retention on original and updated submissions, and audit trails.
 - **Data Policy.** Following the Systems Audit, EIA will work with GWPC to develop FracFocus data standards comparable to those of federal statistical agencies. A Security Audit is also being conducted in conjunction with the Systems Audit.
 - Amend the current terms of use to eliminate restrictions on data sharing and aggregation.
 - DOE is working with the GWPC and IOGCC on this recommendation.
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- Any state or federal agency that adopts FracFocus for a reporting tool should also adopt a policy to retain a copy of the data from FracFocus on a regular basis.
- Accelerate the rollout of the Risk Based Data Management System (RBDMS) module to states that receive chemical disclosure data through FracFocus.
- Public interest organizations want assurance that states or federal agencies will retain FracFocus data to facilitate legal challenges, information requests, and wider use of the data for regulatory oversight or rulemaking.
- **See 1. State Regulatory Oversight.** Improve linkages between FracFocus and state regulatory data systems. States, with FE funding assistance, are already working to improve the efficiency of data transfer and analysis.

5. Maintain *FracFocus* as a database with analytical tools

- Consider potential improvements such as:
 - Allow searching by any field included in a FracFocus submission record.
 - Eliminate 2000 record display limit or allow a “next” function.
 - Solve the CAS number concatenation problem.
 - Allow batch downloads of PDFs.
 - Include a dropdown menu for users entering data to identify their affiliation.
- Many of these upgrades will be addressed in the Systems Audit and upgrades for FracFocus 3.0.
- **See 1. Systems Audit.** Establish performance criteria for FracFocus and make the necessary upgrades.
- **Performance Data.** DOE, in partnership with the GWPC and IOGCC will explore options for evaluating the systems performance of FracFocus over time, including its utility for regulators, operating companies, and the public.

6. Upgrade the website to be a more usable and interactive database

- Create a web portal to aggregate public information on shale gas development to include statistics on methane emissions, enforcement, and more.
- **Data Investments.** The EIA National Oil and Gas Gateway will be integrated with other datasets using a data browser similar to the coal data browser¹² that EIA developed with support from FE. The coal data browser lets the user track coal from the mine to the power plant. Power plants are easily linked to other data bases using unique ID codes.
- DOE FE will continue to support activities to develop the National Oil and Gas Gateway and innovations in state RBDMS oil and natural gas regulatory data systems. EIA is also making investments to stand up the Gateway.

¹² EIA Coal Data Browser: <http://www.eia.gov/coal/>

7. Improve functionality to meet diverse state requirements

- Address all state requirements, such as Wyoming’s pre-fracturing disclosure and Arkansas’ master list requirements through RBDMS.
 - **RBDMS Improvements.** DOE FE, through its work with the GWPC, is supporting efforts by states to incorporate more data on groundwater resources into state regulatory data systems and to refine the protocols used by states for required pre- and post-drilling water sampling.
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8. Secure stable funding for FracFocus activities

- DOE should move to establish a stable multi-year budget for FracFocus. Consider one or both:
 - A higher multi-year grant or contract from DOE.
 - A reasonable user fee assessed on each well registered.
 - **Stable Funding.** DOE FE recent fiscal year budget requests do not specify a level of funding for either RBDMS or FracFocus. Efforts are underway to make these activities, as well as other forms of DOE FE assistance to state oil and gas regulatory agencies, a more integral part of DOE FE program planning and budgeting.
 - DOE will explore options with the GWPC and IOGCC for the long-term funding of FracFocus activities.
-