A Report on the STRONGER State Review Process

November 2010

Note to Lee – We should consider adding a graphic to the cover.

Executive Summary

During the late 1980s and early 1990s, a unique regulatory approach was developed by state, industry and environmental stakeholders, with assistance by the Federal government, to improve state oil and gas exploration and production environmental programs. The Interstate Oil and Gas Compact Commission (IOGCC) spearheaded a collaborative effort to benchmark state regulatory programs, develop recommended state program guidelines, address regulatory gaps identified by EPA in its 1988 regulatory determination, and establish a review process to evaluate state regulatory programs against those guidelines.

This state review process has undergone a number of changes since its inception. The guidelines have periodically been updated and expanded in scope. Management of the process has shifted to a non-profit corporation named State Review of Oil and Natural Gas Environmental Regulations (STRONGER). The STRONGER Board of Directors is comprised of stakeholders representing states, industry and public interest groups. Board Chairmanship rotates among the stakeholder groups.

Twenty-one state programs, representing over 94% of domestic onshore oil and gas production, have been reviewed and critiqued by stakeholder review teams. Written reports of review team findings and recommendations were developed, published and distributed. Ten reviewed programs have had at least one follow-up review to determine the status of implementation of review team recommendations and to review the programs against updated sections of the guidelines. Follow-up review teams documented that 76% of the recommendations from earlier reviews had been satisfied. This high implementation rate reflects state commitment to the improvement of oil and gas environmental regulatory programs. It further documents the success of the multi-stakeholder process for guidelines development and state reviews.

During the summer of 2009, all states that have been reviewed were surveyed to determine the status of implementation of recommendations contained in the report of their most recent review. All states responding indicated that they had taken steps to improve their programs based on review team recommendations. Of the 593 recommendations to the 16 states that responded, 194 (33%) were described as fully implemented, 161 (27%) as partially implemented, 157 (26%) as outstanding and 82 (14%) as unknown. This indicates that at least 60% of the recommendations have resulted in some improvements to state programs. When coupled with findings of follow-up review teams, the number of review team recommendations resulting in state program improvements increases to 74%.

In 2009 STRONGER formed a Hydraulic Fracturing Workgroup charged with examining the issues and developing draft guidelines for state regulatory programs. Final hydraulic fracturing guidelines were completed and made available in early 2010. Focused reviews of state hydraulic fracturing requirements were initiated. Reviews were conducted in Pennsylvania in July, Ohio in August, Oklahoma in October, and Louisiana in November. The in-state portion of the reviews was conducted in one day by a three-person review team representing the STRONGER stakeholder interests. The team was assisted by official observers representing the stakeholder interests and, when available, representatives from EPA and DOE. Written reports summarizing the programs and containing findings and recommendations were developed, distributed and posted on the STRONGER web site.

While the state review process has been markedly successful, there is additional work that needs to be done. Eleven oil and gas producing states have not yet had an initial review to determine how their programs compare to the Guidelines. Of the twenty-one states that have had an initial review, eleven have not had a follow-up review to evaluate their implementation of earlier recommendations or to conduct a program comparison to Guidelines revisions since the initial review. In recent years there has

been reluctance on the part of states to volunteer their programs for review. This is due, at least in part, to workload and to issues that persist from the mid-1990s, including a lack of federal funding for state preparation for reviews and loss of institutional memory. There is also a level of complacency concerning the potential for congressional actions against the Resource Conservation and Recovery Act (RCRA) exemption and for federal oversight of state programs. While there has not been a serious congressional reconsideration of the exemption since the mid-1990s, vigilance must be maintained. An active, viable state review program which leads to continuing improvements in the protection of public health and the environment represents a safeguard against such actions. Both STRONGER and the IOGCC State Review Committee have responsibilities to assure that a viable process is in place to meet those issues when they arise.

As population centers sprawl outward, and as drilling occurs in previously undeveloped areas, conflicts due to drilling in urban areas are on the increase. In some areas the situation is exacerbated by the severance of surface and mineral ownership. These conflicts have led, in numerous places, to local ordinances that may conflict with state requirements. This can result in unnecessary demands on limited state resources and adversely affect the ability of the state to protect human health and the environment. This can also lead to increased costs and time delays for development. STRONGER needs to continue to monitor these conflicts and should consider developing applicable guidelines.

The state review process administered by STRONGER has been demonstrated to be a successful alternative to federal oversight of state oil and gas exploration and production waste regulatory programs. The process also provides a framework for continuing state program improvements.

Impacts

Since the drilling of Drake's oil well in 1859, an estimated 3.5 million oil and gas wells have been drilled in the United States. The domestic oil and gas exploration and production (E&P) industry has a presence in 32 states and 3 Outer Continental Shelf regions. With more than 500,000 producing wells onshore and approximately 3,800 oil and gas platforms operating offshore, the U.S. is the world's third-largest producing nation. Approximately 2 billion barrels per day of oil and natural gas liquids and over 48.2 billion cubic feet per day of natural gas are being produced. Approximately 1.8 million people, representing about 1% of U.S. employment, are employed in locating, producing, processing, transporting and marketing oil and natural gas. When considering oil and gas products and uses, the oil and gas industry supports 9.2 million jobs and represents 7% of the U.S. economy. Since 2000, Oil and gas companies have invested nearly $2 trillion in U.S. capital projects to advance all forms of energy, including alternatives.

Background

The first oil well was drilled in Titusville, Pennsylvania in 1859 and development of the earliest natural gas collection system occurred in 1881 in New York. Until the 1930s, the oil and gas industry developed with little regulation at the state and federal levels. Early laws in New York, Ohio and Pennsylvania required abandoned wells to be plugged to prevent producing formations from being adversely affected by groundwater. During the period from 1915 to 1920, commissions were established in Texas and Oklahoma and were provided authority to protect groundwater and develop procedures for well plugging. Over the next forty years, most oil and gas producing state legislatures established state regulatory agencies and provided them with similar authorities as well as authority to enforce oil and gas conservation practices. In 1935 the Interstate Oil Compact Commission was formed to promote the conservation of oil through the orderly development of production.

During the early days of the industry there was little regulation by some states of the environmental impacts of E&P activities. Consequently, there were instances of uncontrolled discharges of production fluids to surface waters, groundwater impacts from unlined earthen pits, salt contamination of soils and farmland, and wildlife and domestic animal mortality. Environmental regulation of the industry began in the 1940s with early regulation of brine pits that were polluting domestic supplies. Public attention to environmental impacts of E&P activities was brought into focus by the media following the Santa Barbara oil spill in 1969.

Environmental intervention at the federal level followed. In 1972 the Federal Water Pollution Control Act (FWPCA) was enacted to control the discharge of pollutants to surface waters. The U.S. Environmental Protection Agency (EPA) was formed to implement FWPCA. In 1972, FWPCA was replaced y the Clean Water Act, which requires the prevention, clean-up and reporting of spills through Spill Prevention Control and Countermeasures (SPCC).

In 1974, the Safe Drinking Water Act (SDWA) was enacted. The SDWA authorized EPA to regulate wells used to inject fluids into subsurface formations through the Underground Injection Control (UIC) program. The SDWA also provided for states to apply for primary enforcement authority, or primacy, to administer the program. Under the UIC program, operators of injection wells had to verify mechanical integrity of injection wells.

Following the oil embargo of the 1970s, a renewed "oil boom" occurred. The public demanded that the E&P industry comply with improved environmental requirements. In response, many states developed

new or improved regulatory programs. There was considerable discussion of a federal response. The likely federal control mechanism was the federal Resource Conservation and Recovery Act (RCRA).

RCRA was passed in 1976. Under RCRA, solid waste is basically anything that is discarded and not regulated under other federal statutes, such as the Clean Water Act or the Safe Drinking Water Act. Wastes are designated as hazardous and are regulated under Subtitle C of RCRA or they are considered non-hazardous. Wastes are considered to be hazardous if they are specifically listed as hazardous or if they exhibit hazardous characteristics. Listed hazardous wastes are those shown to exceed certain human toxicity criteria or contain one of over 350 substances listed as hazardous. Characteristically hazardous wastes are ignitable, corrosive, reactive or toxic. There is a mixture rule under which, if a hazardous waste is mixed with non-hazardous waste, the entire mixture may be considered hazardous.

Because of the uncertainty of the impacts of RCRA regulation on oil and gas production, Congress exempted E&P wastes (as well as mining and geothermal wastes) from regulation as hazardous and mandated that the U.S. Environmental Protection Agency (EPA) study the wastes and associated management practices. Congress also directed EPA to report back to Congress with a recommendation on how E&P wastes should be regulated.

EPA did not conduct the study immediately. Consequently, in 1985 EPA was sued by the Alaska Center for the Environment. In settlement, EPA agreed to conduct the study, which was subsequently completed and presented to Congress in December 1987.

In 1985 the American Petroleum Institute (API) conducted a study to determine the volumes of E&P wastes that were being produced. They determined that 20.8 billion barrels (1 barrel equals 42 gallons) of produced water, 361 million barrels of drilling waste, and 12 million barrels of "associated" waste were being produced each year. API and others argued that those volumes of waste could be disposed of in a safe manner without being designated as hazardous.

In the spring of 1988, EPA held public hearings and solicited written comment on whether or not E&P wastes should be regulated as hazardous. In July, 1988, EPA decided not to regulate E&P wastes as hazardous. EPA's regulatory determination gave six reasons for that decision:

- Subtitle C is not flexible enough to avoid serious economic impact on E&P operations;
- Existing state and federal programs are generally adequate, and regulatory gaps could be addressed under non-hazardous portions of RCRA and by working with the states;
- Permitting delays for new facilities would disrupt the search for new oil and gas deposits;
- Subtitle C regulation could severely strain existing hazardous waste facility capacity;
- Regulation under Subtitle C would disrupt and, in some cases duplicate, existing state programs; and
- Regulation under Subtitle C would cause a permitting burden on regulatory agencies.

In its regulatory determination, EPA indicated that state and federal regulations were generally adequate, but that some regulatory gaps existed and enforcement in some states was inadequate. So EPA developed a three-prong approach to define and address the gaps and to work with the states and Congress to improve enforcement by:

- Improving existing programs under RCRA, SDWA and CWA;
- Working with states to improve their programs; and
- Working with Congress on any needed additional legislation.

In its discussion of improvements to state programs in the regulatory determination, EPA indicated that it planned to work with the IOGCC to encourage states to fill the following gaps, where present, in their regulatory programs:

- Controls for roadspreading and landspreading,
- Surface impoundment (i.e., pit) location, design, and maintenance,
- Controls for associated wastes, and
- Plugging abandoned oil and gas wells.

Guidelines development

In 1988, the Interstate Oil and Gas Compact Commission (IOGCC) decided to approach EPA to work on ways to improve state programs and enforcement. The IOGCC is an organization of states that promotes conservation and efficient recovery of oil and gas while protecting health, safety and the environment. It represents the governors of 30 member and 8 associate member states that produce virtually all the domestic onshore oil and gas. The IOGCC Chairman met with EPA to discuss how the IOGCC could help. As a result of that meeting, in January 1989 the Council on Regulatory Needs was formed.

The Council was composed of six environmental regulators and six oil and gas regulators representing the six major producing areas of the United States. In addition there were nine advisors (three state regulators, three industry representatives, and three representatives of public interest) and nine official observers (five from EPA, two from DOE, and two from industry) assigned. The Council was funded by a two-year grant from EPA. At the first Council meeting in February 1989, all participants were invited to the table and the stakeholder process was established.

The Council was charged with developing minimum acceptable guidelines for state oil and gas E&P waste regulatory programs. Council members were separated into a Technical Committee and an Administrative Committee. The Technical Committee consisted of three subcommittees (Pits, Land Application, and Commercial Facilities). The Administrative Committee was made up of four subcommittees (Personnel & Resources, Organization & Coordination, Statutory Authority, and State & Federal Relations). Council members also developed a questionnaire and surveyed the oil and gas producing states to gather information on their existing regulatory programs.

The subcommittees met over the next several months. In June 1989 the Council met to receive draft technical criteria and in December, the Council met again to receive draft administrative criteria. In early 1990 the committee reports were revised and combined with the summary of state programs into a document commonly referred to as the 1990 Guidelines. The goals of the 1990 Guidelines include "the protection of human health and the environment from the management of E&P wastes while maintaining an economically viable oil and gas industry."

The 1990 Guidelines were developed and organized by subject matter. The 1990 Guidelines addressed the first three regulatory gaps indentified by EPA in its regulatory determination; controls for roadspreading and landspreading, surface impoundment (i.e., pit) location, design, and maintenance, and controls for associated wastes. Rather than presenting a series of 'one size fits all' numerical criteria, they establish environmental objectives for state regulatory programs. This is considered to be important because fundamental differences exist from state to state, and within regions within a state in terms of climate, hydrology, geology, economics, and methods of operation. These differences impact the manner in which exploration, development and production occurs. Regulatory programs must vary in order to accommodate the differences in state administrative procedures, laws, and regulatory history.

State reviews

In 1990, EPA provided an additional grant to the IOGCC to begin conducting reviews of state programs against the Guidelines. Review teams were formed to conduct the reviews. Results were developed into written reports. Wyoming was first state to be reviewed (October 1991) followed by Pennsylvania (March 1992).

As the reviews continued, a review process evolved. The IOGCC provided staff support. A questionnaire based on the 1990 Guidelines was sent to the state. One person in the state was responsible for coordinating responses from all state agencies involved in E&P waste regulation. Supporting documentation was provided by the state. A review team of stakeholders (two-four state, one environmental, one industry) and observers (local environmental, local industry, EPA, DOE, BLM & Indian Nation) was formed. The in-state review lasted about one week. Team members were assigned to lead the discussion on the various sections of the 1990 Guidelines. The review team prepared a draft report, with the team member responsible for discussion of each section also being responsible for drafting that section of the report. Reports identified both program strengths and weaknesses. Recommendations for program improvements were based on the 1990 Guidelines. The draft report was sent to the state and to the observers to verify the accuracy of findings and program descriptions. Written comments were received and considered by the review team, which developed a final report that was published and distributed by the IOGCC.

States volunteered to be reviewed. Reviews under the 1990 Guidelines continued through 1994. During that time, rules of participation evolved based on review experiences. Twelve state programs were reviewed through 1994.

Guidelines revision and follow-up reviews

The 1990 Guidelines suggested that the Guidelines be reviewed and updated after three years. Consequently, in 1993 a Guidelines Review Committee was formed with 5 subcommittees. These subcommittees were charged with updating material in the 1990 Guidelines and addressing two new areas, abandoned sites (the fourth regulatory gap identified by EPA in its regulatory determination) and naturally occurring radioactive materials (NORM). Updated material included EPA guidance developed since 1990. The updated and revised Guidelines were presented to the IOGCC in December 1993 and adopted in March 1994. The questionnaire was updated to reflect the revisions.

State reviews under the 1994 Guidelines began in 1995. Also, follow-up reviews to document changes resulting from recommendations contained in reports of initial reviews were initiated. Follow-up reviews in Wyoming (1994) and Oklahoma (1995) were conducted by a single individual. Stakeholders who were involved in the initial reviews and who were not involved in the follow-up reviews protested. Consequently, in 1996 a follow-up review process was developed with full stakeholder involvement. Five state programs were reviewed under the 1994 Guidelines through 1997.

Process issues and breakdown

The state review process appeared to be successful. Seventeen states had been reviewed, representing over 90% of domestic onshore oil and gas wells and production. All states that were reviewed took steps to improve their programs based on review team recommendations. A 1995 Presidential Task Force recognized the state review process as a model for state/federal interaction.

But in 1995 the process began to experience difficulties. EPA decreased funding to the IOGCC for the support of reviews. The IOGCC reorganized its committees and made the State Review Committee a subcommittee of its Environmental and Safety Committee. A number of people who had been involved in the process retired or moved to other jobs, and were replaced by people not familiar with the history of the issues or with the state review process. Some state regulators didn't like to have their programs critiqued. Communications between some of the stakeholder groups deteriorated. Consequently, the state reviews stopped in 1997.

Revitalizing the state review process

While this was occurring, environmental advocates began pressuring EPA to revisit the risks associated with E&P wastes. It had been 10 years since the EPA review of E&P wastes and the regulatory determination. New data and new environmental risk models were available. EPA continued to be supportive of the state review process and, in late 1998, called the stakeholders together to attempt to restart the process. During those discussions, the value of the review process was questioned. In response, the IOGCC formed an ad-hoc committee to document actions taken by the states in response to recommendations for program improvements contained in review team reports. The IOGCC published a report containing those changes in May 1998.

The IOGCC made a commitment to get the process back on track. In March, 1998, the IOGCC sent a proposal to EPA that incorporated stakeholder concerns and interests. That proposal was adopted unanimously by the IOGCC member states. The IOGCC also re-formed its State Review Committee as a separate standing committee. The stated purposes of the State Review Committee are to:

- Provide three state members to the STRONGER Board;
- Enlist states to volunteer to be reviewed;
- Provide state representatives to be review team members;
- Assist states in preparation for reviews; and
- Provide state representatives for guidelines development and revision.

The IOGCC proposal also included the addition of performance measurement to the guidelines. EPA responded affirmatively to the IOGCC proposal in September, 1998.

STRONGER, Inc.

In February 1999, EPA called a meeting of state and industry stakeholders and the U.S. Department of Energy (DOE). During the meeting EPA confirmed its support to the state review process. A governing body was formed, which decided on the named State Review of Oil and Natural Gas Environmental Regulations (STRONGER). Officers were elected. Preliminary rules of participation were adopted. Individuals were assigned responsibilities to:

- Investigate incorporation as a non-profit corporation;
- Draft a work statement for contracted administrative services;
- Solicit environmental/public interest participants; and
- Determine which sections of 1994 Guidelines needed revision.

In June 1999, Articles of Incorporation were filed in the District of Columbia. Bylaws were adopted, officers were elected (Board and Corporate), committee chairs were assigned to lead Guidelines revisions workgroups, and a STRONGER mission statement, goals and work schedule were developed.

The STRONGER Board is composed of stakeholder representatives. Voting members are three state oil and gas regulatory officials, three public interest representatives, and three oil and gas industry representatives. Non-voting members include representatives of EPA and DOE. Board members representing each interest group have staggered three-year terms. The Board Chairmanship rotates among the stakeholder groups. STRONGER Board functions include:

- Managing the state review process;
- Sponsoring new and revised guidelines and questionnaires;
- Developing procedures for reviews, dispute resolution and training;
- Approving review-team membership;
- Contracting administrative and clerical support; and
- Settling disputes.

STRONGER received funding from EPA, DOE and API. Revisions to the 1994 Guidelines were completed in 2000. The 2000 Guidelines included sections on General/Administration, Technical, Abandoned Sites, Naturally Occurring Radioactive Material (NORM), and Performance Measures. An important addition to the 2000 Guidelines was the addition of performance measures to evaluate how well state programs achieve the goal of protecting human health and the environment. The IOGCC accepted the 2000 Guidelines as the basis for STRONGER reviews of state programs.

The STRONGER review process

STRONGER resumed initial and follow-up state reviews. Review teams are comprised of official team members (state regulatory officials, public interest stakeholder representatives, and oil and gas industry representatives). There are official observers (local government organizations, local oil and gas industry, states to be reviewed in the future, IOGCC, EPA, DOE, BLM and Indian nations). Review team expenses are paid by STRONGER (transportation, lodging and meals) and compensation is provided as necessary. Review-team size is determined by STRONGER based on equal stakeholder representation, the size of the state program to be reviewed, the amount of production, public concern about the state program, and the complexity of interagency relationships.

Rules of Participation were adopted in 2000. They establish rules for the selection and conduct of participants. Under the rules, team members and official observers are nominated by Board stakeholder representatives. Nominees are expected to reveal any conflict of interest. The list of nominees is submitted to the state being reviewed. If a written objection to any nominee is received from a Board member or the state, the Board resolves the objection or a new nomination is submitted for consideration. Team members are approved by formal Board action.

States volunteer to be reviewed. The Board establishes the review time frame in consultation with the state. If requested, the Board may hold public hearings or participate in outreach efforts to explain the state review process. The Board provides training to review team members and may arrange a field trip if one is needed. The state being reviewed assigns one key individual as the state contact person. That person notifies and coordinates all state agencies involved, coordinates completion and submission of the questionnaire, coordinates assembly of supporting material, arranges attendance of appropriate personnel during the review, and coordinates responses of all state agencies to the draft report. The Board provides the state contact person with the State Review Questionnaire. State agencies have up to 90 days to complete the questionnaire and assemble supporting materials. The state contact person is responsible for providing the completed questionnaire and documentation to the Board 60 days before the review. If this slips to less than 30 days, the review will be rescheduled. All written communication regarding the review between the review team and state is to be directed through Board staff so that all participants are provided with the same information.

State reviews are generally scheduled for one full business week. Team members are expected to attend a training session, participate in selection of a team leader (who is a state representative), establish a schedule for preparation of draft and final reports, volunteer or accept assignment to lead the discussion and report drafting on specific sections, attend an organizational meeting the day before the review begins, and attend the entire review session.

Reviews are conducted as "sunshine" meetings open to the general public. State representatives provide an overview for each Guidelines section. Follow-up questioning is conducted by review team members and observers. Review sessions generally begin at 8:00 AM and end at approximately 2:00 PM each day. The review team then meets in executive session to develop comments on that day's discussions. Board staff facilitates the executive session discussion and provides team members with a list of comments and issues for each day. The state contact person is also briefed and provided with the daily list of comments and issues.

Team members draft assigned sections of the written report. Each section is to include a summary of the state program, related findings, documentation of strengths and best practices, recommendations for program improvements, and comments and issues provided by all team members. Report content is to be based on the STRONGER guidelines. Report content is to be considered confidential until after final report publication.

Draft sections are submitted to Board staff within four weeks after the review is completed. Board staff compile, format and edit the sections into a draft report and distribute it to the team members. Team members meet to discuss each section and develop the "official" draft report. That meeting occurs within five to six weeks after the review and lasts for a maximum of three days. Each team member is responsible for maintaining a mark-up of changes to their section(s).

The written report is to recognize strengths and unique qualities of the state program, encourage the sharing of best practices among states, provide suggestions for areas not meeting the guidelines, and cite specific guidelines sections for recommendations. Any recommendation not tied to the guidelines is to be noted as "outside the scope of the guidelines" and may be included in an appendix. The draft report is sent to the state contact person and official observers for a 30-day review and comment period. Board staff distributes all comments to review team members and official observers. The review team has 30 days to consider any comments and finalize their report. The report is submitted to the STRONGER Board for approval and publication.

Team members strive to reach consensus in developing findings and recommendations. If a dispute arises, the team may request Board assistance to resolve it. The Board may appoint a facilitator for mediation. The mediator will set ground rules, assure that individuals and opinions are respected, and include stakeholder support of the concern. If mediation fails, the Board may appoint a three-person subcommittee of equal stakeholder representation to assist the team in reaching consensus, or prepare a recommendation for resolution by the Board. The full STRONGER Board is the final arbiter of any dispute.

The follow-up review process mirrors the initial review process. The review content includes state actions on recommendations from previous reviews and an initial review of new or revised guidelines material. The Board may decrease the team size or the duration of review as appropriate.

A "lite" review process was developed in 2003 for smaller state programs. During this process the state omits completion of a written questionnaire and instead provides a program summary and supporting documentation. The range of issues discussed during the review is the same as during a regular review. One state has been reviewed under this option.

In 2004 the STRONGER Board met with the Ground Water Protection Council (GWPC) which conducts "peer" reviews of state programs pertaining to the underground injection control program. Because of the similarity of the reviews and inherent efficiencies, it was decided to provide states with the option of a joint STRONGER/GWPC review. Two states have selected this option.

In 2005, STRONGER revised and expanded the 2000 Guidelines. The 2005 Guidelines incorporate Spill Prevention and Performance Measures into the Administrative Criteria section and were expanded to include a new section on Stormwater Management. The 2005 Guidelines have not yet been accepted by the IOGCC; however, states have requested their use during subsequent reviews. The 2005 Guidelines are posted on the STRONGER web site and remain available for use by states who volunteer to be reviewed against them.

Hydraulic fracturing

In recent years there have been new developments in technology for the exploration and production of natural gas from tight formations such as the Barnett, Haynesville and Marcellus shale. The use of enhanced seismic techniques, horizontal drilling and high volume hydraulic fracturing are on the increase. Coupled with these nonconventional gas developments are several water issues. This nonconventional gas development, especially in previous non-producing areas, has led to public concern and a call for additional regulatory oversight. Questions are being raised about the impacts on water resources of the large volumes of surface and ground water being used for hydraulic fracturing, the potential impacts that may be posed by the fracturing operations, and the proper disposal of used fluids once hydraulic fracturing is completed. Although there is an increasing demand for natural gas, some organizations are calling for moratoria on drilling until these issues are satisfactorily addressed. To meet this challenge, in 2009 STRONGER has formed a Hydraulic Fracturing Workgroup charged with examining the issues and developing draft guidelines for state regulatory programs. Draft guidelines were distributes to the states, environmental groups and industry associations and posted on the web for comments. Final hydraulic fracturing guidelines were completed and made available in early 2010.

Focused reviews of state hydraulic fracturing requirements were initiated. Reviews were conducted in Pennsylvania in July, Ohio in August, Oklahoma in October, and Louisiana in November. The in-state portion of the reviews was conducted in one day by a three-person review team representing the STRONGER stakeholder interests. The team was assisted by official observers representing the stakeholder interests and, when available, representatives from EPA and DOE. Written reports summarizing the programs and containing findings and recommendations are being developed, distributed and posted on the STRONGER web site. Since some of the reports were not yet finalized when this report was prepared, they are not included in the following discussion.

Benefits of the process

The STRONGER state review process is an open, stakeholder-driven process rather than a bureaucratic oversight exercise between federal and state agency personnel. The open process greatly enhances the credibility of the reviews and of the recommendations the teams make to the reviewed programs. The entire process, including establishing the guidelines, conducting the reviews, and administering the review process, is public and is conducted by industry, government and public interest stakeholders.

During a review, the regulatory program is measured against written standards. Agreement about what constitutes successful program performance is reached before a state program is reviewed. The reviewed

state program is then measured against an agreed-upon template, rather than against the reviewers' subjective judgments about "how it should be done". All recommendations to a state are based on standards contained in the guidelines.

State program performance is focused on environmental results. The measurement of the numbers of inspections performed or violations cited alone do not offer much information about the health of the environmental values the program seeks to protect. The reviews ask "How do you know your activities are improving human health and the environment?"

State reviews focus on program strengths as well as areas needing improvement. Techniques and approaches that work well are documented and shared among the states. With the overall objective to improve human health and the environment, the state review process contains a "consulting" role in addition to its "audit" role to help states improve their performance.

Both the guidelines and the state review process have addressed the four regulatory gaps identified in EPA's regulatory determination;

- Controls for roadspreading and landspreading,
- Surface impoundment (i.e., pit) location, design, and maintenance,
- Controls for associated wastes, and
- Plugging abandoned oil and gas wells.

The state review process has resulted in identifiable improvements to state regulatory programs and the environment. All states that have been reviewed have indicated that they have made improvements to their programs through implementation of at least some of the recommendations contained in the report of the review. The discussion below quantifies those improvements.

State reviews - their status and effectiveness

Twenty-one states have volunteered to be reviewed against the Guidelines. Ten of those states have volunteered for follow-up reviews and two states volunteered for second follow-up reviews. States that have been reviewed represent the majority of U.S. onshore oil and gas production.

Table 1 shows the states with oil and gas production. It also shows the states that have volunteered for initial and/or follow-up reviews as well as when those reviews occurred. The version of the Guidelines used during the review is also indicated.

Table 1
Summary of Oil & Gas Producing States and State Reviews

State	Initial review	Follow-up review(s)
Alabama		
Alaska	1992*	
Arizona		
Arkansas	1993*	
California	1993*	2002***
Colorado	1996**	
Florida		
Illinois	1996**	
Indiana	2004***	
Kansas	1993*	
Kentucky	1995**	2006****
Louisiana	1994*	2003***
Maryland		
Michigan	2003***	
Mississippi		
Missouri		
Montana		
Nebraska		
Nevada		
New Mexico	1994*	2001***
New York	1994*	
North Dakota	1997**	
Ohio	1995**	2005***
Oklahoma	1992*	1995*, 2004***
Pennsylvania	1992*	1997**, 2004***
South Dakota		
Tennessee	2007****	
Texas	1993*	2002***
Utah		
Virginia	2003***	
West Virginia	1992*	2002***
Wyoming	1991*	1994*

Note: * indicates 1990 Guidelines ** indicates 1994 Guidelines
*** indicates 2000 Guidelines **** indicates 2005 Guidelines

A summary of the recommendations contained in reports of those reviews is shown in Table 2. Where follow-up reviews were conducted by stakeholder review teams, the number of recommendations that were considered satisfied by the team, along with the number of recommendations from new material contained in revised Guidelines, is shown.

Table 2
Summary of Recommendations Contained in Reports of State Reviews

State	Initial review - recommendations	Follow-up review - satisfied w/response	Follow-up review - new recommendations
Alaska	107		
Arkansas	55		
California	44	26	17
Colorado	57		
Illinois	62		
Indiana	40		
Kansas	40		
Kentucky	54	24	25
Louisiana	37	21	13
Michigan	5		
New Mexico	75	63	5
New York	37		
North Dakota	27		
Ohio	32	26	2
Oklahoma	71	59	5
Pennsylvania	25	24 (1997)	1
		1 (2004)	5
Tennessee	57		
Texas	44	25	29
Virginia	19		
West Virginia	22	17	9
Wyoming	40	19	

Table 2 indicates that where follow-up reviews occurred, review teams were satisfied with state responses to 306 of 405 recommendations (76%). This high rate reflects state commitments to the improvement of oil and gas environmental regulatory programs. It further demonstrates the success of the multi-stakeholder process for guidelines development and state reviews.

Wyoming was the first state to be reviewed. The initial Wyoming review was conducted in 1991. The follow-up was conducted by a single person rather than by a multi-stakeholder review team. A number of program improvements were noted in the report. Line items in the budget better reflected time devoted to E&P waste regulation. A full-time staff attorney was employed to work on E&P waste related issues. A "call-in" system was initiated for approximately 4,500 pits that existed prior to June 1, 1984 to have them either permitted or closed. Rule 401 was adopted which provided for the comprehensive regulation of pits at well sites. Form 14B, an application form for the permitting of pits, was developed to gather information necessary to enable Oil and Gas Commission to make proper permitting decisions. Rule 404 was amended to regulate tanks used for the storage of produced water. Rule 304, which specifies requirements for the bonding program, was amended to create five classifications of wells and provide for four bonding options. Rule 322, the general drilling rule, was amended to require setback distances to provide buffers between wells and homes or other buildings where people were known to congregate. Rule 501 was amended to require 45 days notice prior to a Commission hearing where rules will be changed or new rules adopted. And the Commissions computer system was upgraded and its use expanded.

Pennsylvania was the second state to be reviewed with an initial review occurring in 1992. Two follow-up reviews were conducted in 1997 and in 2004 subsequent to revisions and additions to the Guidelines. A number of program improvements were noted in the reports of follow-up reviews. A waste characterization study was conducted and a report was published that included includes recommendations for pit closure along with specific procedures for on-site burial, on-site land application, off-site disposal, and bioremediation. Permitting efficiency was improved and a money-back guarantee was initiated if permit applications were not acted upon within specified time frames. A public information office was opened in the central and regional offices. And the Oil and Gas Operators Manual, which includes laws, regulations, policies, forms, and guidance to operators, ,as well as a report on NORM occurrence at E&P locations was posted on the web.

Oklahoma had an initial review in 1992 and a follow-up review 2004. Numerous program improvements were noted. Legislation clarifying the authority for E&P waste regulation was enacted. An environmental crimes statute was enacted. The Oklahoma Energy Resources Board, which cleans up abandoned sites and provides educational programs, was created. Authority to place liens on equipment when plugging wells was obtained. New rules were adopted for surface facilities at enhanced oil recovery operations and for oil reclaiming facilities. Rule changes clarified on-site burial requirements and expanded the waste management hierarchy to over 40 waste streams. An ODEQ/OCC jurisdictional guidance document was developed. The "Guardian Guidance" document for the cleanup of contaminated sites was developed. A policy for the periodic review of all commercial facilities was established. A penalty calculation schedule was developed. The number of field inspectors was increased, hydrogeologists were placed in the district offices, and additional legal staff and a full-time employee to collect fines and penalties were provided. Additional equipment and training were provided to field staff. The data management system was upgraded, and a waste tracking and reporting system for waste haulers was established.

West Virginia had its initial review in 1992. The follow-up review occurred in 2002. Several program improvements were noted. A long-term planning process had been developed. Program staff expertise was being shared among various programs within the Department. Increased legal support was provided to the program. An abandoned and orphan well plugging program was implemented. An NPDES permit was developed to regulate produced water discharges and a general permit was issued for treatment facilities related to those discharges. A web site was created to increase public access to program information. And GPS capabilities were upgraded to improve data pertaining to facility location.

California had its initial review in 1993. A follow-up review was conducted in 2002. Numerous program improvements were noted. Outreach and public education programs were expanded. Web-based and printed guidance documents were developed. Data sharing among agencies was expanded. Well location data was improved through the use of GIS equipment. Interagency coordination on spill reporting, orphan and idle wells, and emergency response had improved and MOUs were updated. Legal staff support was added to the program. Cross-training across agencies was provided so that inspectors could report issues observed to other jurisdictional agencies. Permitting backlogs were reduced. Authority to consider an operator's compliance history across agency jurisdictional lines during permit decisions was provided. Regularly scheduled reviews of centralized and commercial facilities were initiated. Spill reporting and emergency response responsibilities were clarified and centralized in a single agency. Pit siting requirements were clarified, and a consistent pit sampling and closure policy across agencies was developed. A NORM survey was conducted, and additional resources were obtained for the orphan and abandoned well plugging program.

Texas was initially reviewed in 1993. There was a follow-up review in 2002. Several program improvements were noted in the report. The Railroad Commission began considering the compliance history of eh operator when making permit decisions. The Oil Field Cleanup Fund Advisory Committee

was established to provide advice the Commission. A bonding program was established to insure closure of reclamation plants and commercial disposal facilities. The data management system was expanded and upgraded. A Field Inspection Manual was developed, and a Memorandum of Understanding between the Commission and TCEQ to coordinate E&P waste management activities.

New Mexico had an initial review in 1994 and a follow-up review in 2001. Numerous program improvements were noted. Interagency coordination was improved. A workload analysis was performed and business practices were streamlined. Permit efficiency was improved. Increased legal support was provided to the program. Regulatory policies and memoranda, including requirements for centralized facilities, were incorporated into rules. The "Environmental Handbook" was published on the web. An abandoned sites program was established and a ranking system was established for contaminated sites. Contingency planning requirements for hydrogen sulfide were established. Procedures for consideration of compliance history during permit decisions were established. Financial assurance requirements were evaluated and increased. Well plugging contract procedures were improved. Siting restrictions were established. A stakeholder advisory committee for regulation development and feedback on implementation was created, and public participation in the permitting of centralized facilities was improved. Reporting requirements quantities for spills were clarified. Statewide emergency response contingency planning and spill response procedures were developed. Remediation standards for pit closure, spills and other releases were established. An incentive program to promote reduction, reuse and recycling was implemented. An improved tracking system with computerized capabilities was put in place, and field staff received additional training.

Louisiana had an initial review in 1994 and a follow-up review in 2003. A number of program improvements were noted. A financial assurance program was implemented. MOUs were developed with other agencies clarifying each agency's jurisdiction and responsibilities. Staffing and supporting funding increased. Equipment was provided to field staff to access aquatic sites. Spill response coordination was improved. Siting criteria were clarified. Review of commercial facilities on a regularly scheduled basis was initiated. Tracking of produced water was initiated and the volumes were posted on the web. And the public outreach program was expanded.

Ohio's initial review occurred in 1995. A follow-up review was conducted in 2005. Several program improvements were noted in the report. Guidance documents for operator contingency planning, for remediation of contaminated sites, and for pit construction, operation and closure were developed. Numerous activities were undertaken to improve public participation in the program. The data management system was improved and its use expanded. And siting criteria for E&P waste management facilities were developed.

Kentucky was initially reviewed in 1995. A follow-up review occurred in 2006. A number of program improvements were noted. A reorganization that placed the oil and gas regulatory program in the environmental cabinet agency resulted in improved communication, coordination, data sharing and legal support to the program. An Oil and Gas Operators Manual was developed to notify operators of permitting and other regulatory requirements. The data management system was improved and the computerized tracking system was expanded to include enforcement actions. Penalty calculation guidelines were developed. The state emergency response program was revised to include E&P sites. A stakeholder workgroup was established to provide input in the regulation development process. Licensing of waste haulers was initiated. A fee-based program for regulation of pipelines was established.

Copies of the reports of all reviews can be found on the web at www.strongerinc.org . For states that have had follow-up reviews, a compilation of recommendations from initial reviews and related findings from follow-up reviews can be found in Appendix A.

In order to obtain an updated picture, during the summer of 2009 all states that have been reviewed were surveyed to determine the status of implementation of recommendations contained in the report of their most recent review. Where follow-up reviews occurred, recommendations from earlier reviews that were considered satisfied by the review team were not included. Results of that survey are summarized in Table 3. It is important to note that the results do not represent a qualitative review by a multi-stakeholder review team such as would occur during a follow-up review.

Table 3
Status of Outstanding Recommendations from State Survey

		Reported by state as		
State	Recommendations	Fully Implemented	Partially Implemented	Outstanding/ (Unknown*)
Alaska	107	30	4	4 (69)
Arkansas	55	did not respond to survey		
California	35	15	9	11
Colorado	57	did not respond to survey		
Illinois	62	25	13	24
Indiana	40	20	18	2
Kansas	40	15	14	11
Kentucky	55	5	17	26 (7)
Louisiana	29	12	6	13
Michigan	5	3	1	1
New Mexico	17	did not respond to survey		
New York	37	10	14	13
North Dakota	27	did not respond to survey		
Ohio	8	1	6	1
Oklahoma	30	14	10	6
Pennsylvania	5	2	3	-
Tennessee	57	14	23	18 (1)
Texas	48	19	16	13
Virginia	19	did not respond to survey		
West Virginia	14	-	2	12
Wyoming	21	9	5	2 (5)

* Note: Some recommendations were for agencies that did not respond, or were no longer valid because of changed legislation or reorganization of state agencies.

Of the 593 recommendations to the 16 states that responded, 194 (33%) were described as fully implemented, 161 (27%) as partially implemented, 157 (26%) as outstanding and 82 (14%) as unknown. This indicates that at least 60% of the recommendations have resulted in some improvements to state programs. When the information from Table 2 concerning follow-up review team satisfaction with responses to earlier recommendations is coupled with information from Table 3 concerning recommendations reported as implemented by the states, the effectiveness of the state review process is demonstrated. It indicates that 74% of review team recommendations resulted in state program

improvements. Since some recommendations are still under consideration, additional improvements are likely to occur.

Meeting future challenges

Although the state review process has been demonstrated to be successful in improving the quality of state oil and gas environmental regulatory programs, additional state reviews are needed. As shown in Table 1, eleven oil and gas producing states have not yet had an initial review to determine how their programs compare to the criteria set forth in the Guidelines. And of the twenty one states that have had an initial review, eleven have not had a follow-up review to evaluate their implementation of earlier recommendations or to conduct a program comparison to Guidelines revisions since the initial review. There has been a reluctance of states to volunteer their programs for review. This is due, at least in part, to workload and to issues that persist from the mid-1990s, including a lack of federal funding to support the process, a lack of full support by some IOGCC member states, and the fact that state oil and gas directors are retiring or moving on to other jobs and are being replaced by people not familiar with the history of the issues or with the state review process. There is also a level of complacency among some state regulators concerning the potential for congressional actions against the RCRA exemption and the potential for federal oversight of state E&P environmental regulatory programs. While there has not been a serious congressional reconsideration of the exemption since the mid-1990s, as political changes occur, vigilance must be maintained. An active, viable state review program which leads to continuing improvements in the protection of public health and the environment represents a great safeguard against such actions. Both STRONGER and the IOGCC State Review Committee have responsibilities to assure that a viable process is in place to meet those issues when they arise.

As population centers sprawl outward, and as drilling occurs in previously undeveloped areas, conflicts due to drilling in urban areas are on the increase. In some areas the situation is exacerbated by the severance of surface and mineral estates. These conflicts have led, in numerous places, to local ordinances that may conflict with state requirements. This can result in unnecessary demands on limited state resources and adversely affect the ability of the state to protect human health and the environment. This can also lead to increased costs and time delays for development. STRONGER needs to continue to monitor these conflicts and should consider developing applicable guidelines.

Air quality issues are receiving attention. A number of states have initiated programs to regulate air quality impacts related to E&P, particularly in nonconventional gas development. The workgroup that developed the hydraulic fracturing guidelines recommended that STRONGER consider forming a workgroup of experts to evaluate currently available data and the need for additional information, and evaluate the need for development of state program guidelines for air quality issues resulting from oil and gas exploration and production. They further recommended that part of that effort include the evaluation of air emissions from hydraulic fracturing operations.

In recent years there has been a lack of federal funding to support state preparation for the review process. Federal budget issues have made support of the process a low priority for both EPA and DOE. Although funding at a level to maintain the program has been provided by the API, such funding is insufficient to conduct the number of reviews and follow-up reviews that are needed for a viable program of continuing state program improvements.

Conclusions

The state review process initially developed by the IOGCC and presently administered by STRONGER has been demonstrated to be a successful alternative to federal oversight of state oil and gas exploration and production waste regulatory programs. The process includes the development of minimum state

regulatory program guidelines and the review of state regulatory programs against the guidelines to evaluate program effectiveness. The guidelines and reviews address the four regulatory gaps identified by EPA in its 1988 regulatory determination. By including stakeholder involvement in the development of state program guidelines, a system of checks and balances was put into place that gives credibility to the process. Rather than representing a series of 'one size fits all' numerical criteria, the guidelines establish environmental goals or objectives for state regulatory programs. This is considered to be important because of the regional and local variables in climate, topography, geology, hydrology and regulatory history.

Reviews by stakeholder review teams of 21 state regulatory programs representing over 94% of domestic onshore oil and gas production of state regulatory programs against the guidelines, with subsequent documentation of review team observations of program strengths and recommendations for program improvements provide a baseline against which to measure state program improvements. Follow-up reviews evaluate state actions on recommendations from previous reviews as well as a review of new or revised guidelines material in the current version of the guidelines. Follow-up reviews in 10 states and a recent survey show an effectiveness rate of 74% of review team recommendations resulting in state program improvements. This demonstrates that the state review process provides a framework for encouraging and measuring continuing state program improvements.

While the state review process has been successful, challenges remain for the future. Recruitment of states to be reviewed needs to be improved and adequate funding of the process needs to be provided. And conflicts resulting from drilling in urban areas need to be addressed. And air quality impacts from E&P activities are being discussed. As the energy demands of this country increase, additional areas of environmental controversy associated with E&P activities will develop. The STRONGER stakeholder process will continue to provide a viable way to address these challenges.

Note: Additional information related to STRONGER and copies of all reports of state reviews are available on the STRONGER web site at www.strongerinc.org .