

## An Overview of EPA's New Rules Regulating the Underground Injection of Carbon Dioxide

by Anthony B. Cavender

*On December 10, 2010, the Environmental Protection Agency promulgated final rules regulating the underground injection and geologic sequestration of large quantities of carbon dioxide (CO<sub>2</sub>) emitted by power plants and other industrial facilities.<sup>1</sup> These rules, first proposed by EPA in 2008, have been issued by the agency pursuant to its authority under the Safe Drinking Water Act,<sup>2</sup> and are effective as of January 10, 2011.*

The rules will apply to the owners and operators of a new class of Underground Injection Control (UIC) wells that will be known as Class VI injection wells and used to inject CO<sub>2</sub> deep into the subsurface for the purpose of the long-term storage or geologic sequestration of CO<sub>2</sub>, which is part of an overall process known as carbon capture and storage or "CCS."<sup>3</sup> EPA believes that CCS could be a key mitigation technology for achieving domestic emissions reductions. Moreover, "establishing a supporting regulatory framework for the future development and deployment of CCS technology can provide the regulatory certainty needed to foster industry adoption of CCS."<sup>4</sup>

### The New Rules

"Geologic sequestration" is now defined in the rules as "the long-term containment of a gaseous liquid, or supercritical carbon dioxide stream in subsurface geologic formations. The term does not apply to carbon dioxide treatment or transport."

Since the Safe Drinking Water Act also requires EPA to take strong measures to protect underground sources of drinking water (USDW), and prescribes that EPA issue regulations for state programs that con-

<sup>1</sup> The rules were published in the Federal Register at 75 Fed. Reg. 77230 (December 10, 2010). The Class VI rules are located at new subpart H of 40 CFR Part 146. Comments were submitted to EPA by a large number of interested parties including Anadarko, Eastman Chemical, the Western Business Roundtable, American Electric Power, the American Petroleum Institute, ExxonMobil, the Sierra Club and the National Resources Defense Council.

<sup>2</sup> See 42 U.S.C. §300f et. seq.

<sup>3</sup> Class VI wells have been added to the list of UIC wells that can be found at 40 CFR §144.6.

<sup>4</sup> As stated in the Notice of Proposed Rulemaking, at 73 Fed. Reg. 43492 (July 25, 2008).

tain minimum requirements for effective programs to prevent underground injection activities that endanger drinking water sources,<sup>5</sup> the new rules require that Class VI wells used for geologic sequestration of CO<sub>2</sub> must adhere to a variety of technical criteria and requirements including:

- New informational criteria, to provide information on the geologic structure and hydrologic properties of the proposed storage site, a tabulation of all wells within the Area of Review that penetrate the injection or confining zone, baseline geochemical data, numerous specified plans and financial responsibility demonstrations. See 40 CFR § 146.82.
- Site Characterization, which demonstrates to the Director (usually the head of a state regulatory agency) that the wells will be sited in areas with a suitable geologic system. This requirement is described as a "fundamental component" in the permitting process. See 40 CFR §§ 146.82 and 83.
- A delineation of the Area of Review for the proposed geologic sequestration project. The Area of Review must be reevaluated every five years. See 40 CFR § 146.84.
- A requirement to prepare and implement a Corrective Action Plan which, when approved by the Director, will provide for the use of methods to ensure that wells within the Area of Review do not serve as conduits for the movement of fluids into any USDW. See 40 CFR § 146.84.
- Requirements controlling Injection Depth waiver requirements if permission is sought to have EPA waive the requirement that the injection of CO<sub>2</sub> must take place below the lowermost USDW. See 40 CFR § 146.95.
- New Injection Well Construction requirements. See CFR 40 § 146.86.
- New Injection Well Operating Requirements, such as those affecting injection pressure, the use of continuous recording devices to monitor the CO<sub>2</sub> stream and the use of alarms and shut-off systems, and when injection must cease. See 40 CFR § 146.88.
- Mechanical Integrity testing. See 40 CFR § 146.89.
- The Testing and Monitoring requirements which will verify whether the project is operating as permitted and is not endangering any USDW. See 40 CFR § 146.190.
- Recordkeeping and Reporting Requirements which mandate that various semi-annual, 30-day and 24-hour reports be submitted, and that records be maintained for 10 years. See 40 CFR § 146.91
- An Injection Well Plugging Plan, and regulatory requirements to provide notice of an intent to plug, and maintaining well plugging reports for 10 years. See 40 CFR § 146.92
- A Post-injection Site Care and Site Closure Plan. Following the cessation of injection, the Class VI well owner or operator must continue to conduct monitoring as specified in the Plan for at least 50 years, or for the duration of an alternate timeframe approved by the Director. The monitoring must continue until the project no longer poses an endangerment to any USDW. A notice of intent to close the site must be provided at least 120 days before site closure, and a site closure report must be submitted within 90 days of closure. This report must be maintained for 10 years. Also, local deed and property records must contain a notation that the land has been used to sequester carbon dioxide. See 40 CFR § 146.93.
- An Emergency and Remedial Response Plan that will address the actions the owner or operator must take in response to the movement of the injection or formation fluids that may cause an endangerment to any USDW. This plan must be reviewed every five years. See 40 CFR § 146.94.



<sup>5</sup> 42 U.S. C. §300h(d)(2) and 300h-1.

- New Financial Responsibility rules to demonstrate that the owner or operator of the Class VI well has adequate financial resources to address the endangerment of any USDW. The demonstration is subject to the approval of the Director, and must be accompanied by a detailed estimate of the cost of performing corrective action, well plugging, post-injection site care, and remedial response. See 40 CFR § 146.85.
- The duration of a Class VI UIC permit is the operating life of the project and the post-injection site care period. See 40 CFR § 144.36(a).


### The Role of the States

The foregoing criteria will be applied and administered in the permit process. The new Class VI permit process itself will be managed by EPA in some instances, but mostly by state regulatory agencies whose UIC programs have been authorized by EPA. Clearly, EPA hopes that a new federal/state partnership will develop to oversee this new Class VI program, which is characteristic of most regulatory programs authorized by the Safe Drinking Water Act. Accordingly, the State UIC Program Requirements have been revised and amended to provide that states can seek EPA's approval to administer the Class VI UIC program. Class VI program applications must be filed electronically with EPA and the program description must satisfy 40 CFR § 145.23. Those states that decide against seeking "fully primacy" for the entire UIC injection well program must file an application with EPA for partial primacy by September 6, 2011. After that date, if the state has not met the filing deadline, the Federal Class VI program will be authorized to operate in the state, and indeed in any state that chooses not to seek primacy. The states that have proposed or adopted their own versions of the Class VI program include Kansas, North Dakota, Texas, Washington and Wyoming.

### RCRA and CERCLA

EPA also discussed two issues of concern to the regulated community: the application of the Resource Conservation and Recovery Act (RCRA) and CERCLA ("Superfund") rules and policies to CO<sub>2</sub> streams.<sup>6</sup> A "CO<sub>2</sub> stream" is defined in the rules as "carbon dioxide that has been captured from an emission source (e.g., a power plant), plus incidental associated substances derived from source materials and the capture process, and any substances added to the stream to enable or improve the injection process. This subpart does not apply to any carbon dioxide stream that meets the definition of a hazardous waste under 40 CFR part 261." EPA notes that while a CO<sub>2</sub> stream is not itself a listed hazardous waste, captured CO<sub>2</sub> could contain some impurities that would require its classification as a "characteristic" hazardous waste, limiting its injection to a permitted Class I hazardous waste injection well. Therefore, owners and operators of Class VI wells must determine whether their CO<sub>2</sub> stream is a hazardous waste under the RCRA rules. EPA also cautions that Class VI wells cannot be used for the "co-injection" of hazardous waste along with the CO<sub>2</sub> stream. However, EPA also states that it will commence a new rulemaking proceeding to address the applicability of the RCRA rules to CO<sub>2</sub> injection for purposes of geologic sequestration.

With respect to CERCLA, EPA states that CO<sub>2</sub> is not a listed hazardous substance whose release will trigger the applicability of CERCLA's release reporting and response obligations. Nevertheless, the CO<sub>2</sub> stream may contain a listed hazardous waste or may mobilize substances in the subsurface that could react with ground water to produce listed hazardous substances. If that should happen, CERCLA liability could result from a release of a specific CO<sub>2</sub> stream, depending on the composition of the stream and the environmental media in which it is stored. The agency also notes that there is a specific CERCLA liability

 <sup>6</sup> See 73 Fed. Reg. 77230 at 77260.

exemption for "federally permitted releases," and a Class VI permit may provide such an exception if the injectate behaves in accordance with the permit requirements.<sup>7</sup>

## Unresolved Issues

There are a number of issues that have not or could not be settled by this rulemaking. For example, does the capture and storage of CO<sub>2</sub> involve the management of a "discarded material" as that term is used by RCRA and interpreted by the courts to define a solid waste that may be regulated?<sup>8</sup> Will this uncertainty invite regulatory delay and future litigation? In addition, these issues bear watching:

- How many states will accept EPA's invitation to assume primary jurisdiction of this new program during a time of economic stress and uncertainty? As noted above, if a state chooses not to seek such primacy, then EPA will become the Class VI permitting authority in that State.
- How many companies will be interested in committing to long-term management (possibly 50 years) of a large underground storage facility after the last shipment of CO<sub>2</sub> has been received, injected and stored, and operations have ceased? Will the new Financial Responsibility rules provide these companies, and the permitting authorities, with the assurances they need that potential liabilities can be adequately addressed?
- Will the success of this new approach to CO<sub>2</sub> mitigation depend on whether these residual liabilities can eventually be transferred to the federal government, the states, or a new entity especially created for this purpose?

## Conclusion

The final Class VI injection rules are complex, and EPA has significantly increased the information and recordkeeping requirements since the rules were proposed in 2008. The agency has provided useful guidance on the interconnection between these Safe Drinking Water Act rules and the RCRA and CERCLA programs, and the promised RCRA rulemaking is a welcome development. In addition, concerns over the long-term liability associated with CO<sub>2</sub> geologic sequestration projects may have been eased by establishing procedures whereby this period could be reduced. EPA views these rules as being very much a "work in progress." The agency states that it will employ an "adaptive process" in which it will critically review ongoing research and demonstration projects and gather all relevant information it will need to assess, review, and make necessary modifications and adjustments.<sup>9</sup>

<sup>7</sup> According to EPA, "CERCLA exempts from liability under CERCLA §107 ... certain Federally permitted releases which would include permitted injectate stream as long as it is injected and behaves in accordance with the permit requirements." See 75 FR 77230 at 77260, and 42 U.S.C. §9607(j).

<sup>8</sup> The leading case continues to be American Mining Congress v. EPA, 824 F.2d 117 (CA DC, 1987).

<sup>9</sup> It should be noted that EPA has also promulgated a new Greenhouse Gas Reporting Program under the Clean Air Act that will apply to owners and operators that utilize Class VI CO<sub>2</sub> injection wells for long-term containment and geologic sequestration, as well as all other facilities that inject CO<sub>2</sub> underground. See 75 Fed. Reg. 75060 (December 1, 2010). These rules are effective December 31, 2010, and accordingly, separate reporting requirements under the UIC and GHG programs have been created.

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