

# **Part 1: Analysis of t**

# **Part 1: Analysis of the U.S. Safe Drinking Water Act Relating To Carbon Capture and Geologic Storage**

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This is a regulatory analysis of the Safe Drinking Water Act (42 U.S.C. § 300h-1) [hereinafter referred to as “SDWA”] as it pertains to the geologic storage of CO<sub>2</sub>, otherwise known as “carbon sequestration”. It addresses whether the Underground Injection Control (UIC) program of the federal SDWA is applicable to CO<sub>2</sub> geologic storage.

A group of state oil and gas regulatory attorneys, under the leadership of S. Marvin Rogers of Alabama, prepared the analysis at the request of the Interstate Oil and Gas Compact Commission’s (IOGCC) Carbon Capture and Geologic Storage Regulatory Task Force. Understanding the potential role of the SDWA, and its implementation under the UIC Program, to CO<sub>2</sub> geologic storage is an essential component of defining a state regulatory framework.

As oil and gas resources were developed in the nation, the states, through their respective oil and gas commissions, regulated virtually all aspects of oil and gas operations. The IOGCC, originally the Interstate Oil Compact Commission (IOCC), was established in 1935 by six states (now grown to 30 member states) to promote conservation of oil and gas resources. With encouragement of the IOGCC, states adopted laws to prevent waste of oil and gas resources, protect correlative rights, and provide for proper techniques to conduct safe and environmentally sound oil and gas operations. Regulations covered primary operations and enhanced recovery operations called “secondary recovery operations,” without federal authority.

The issue of the applicability of the SDWA to the storage of CO<sub>2</sub> has raised discussion within the IOGCC whether the SDWA is as broad as it has come to be interpreted. These questions arise because the state oil and gas regulatory commissions regulated virtually all aspects of oil and gas operations long before the federal legislation was enacted to address any aspects of oil and gas operations.

The history of state regulation of oil and gas to prevent waste of oil and gas resources and to protect the correlative rights of the owners is well documented. An IOGCC publication entitled Making A Difference, A Historical Look at the IOGCC documents this early history of the organization. As stated in the booklet, at the time of the creation of the IOGCC, “It quickly became clear that strong opposition existed to any form of federal control of the oil industry.” *Id.* at page 6. In fact, the member-states of the IOGCC worked diligently through its history to ensure that the states would regulate oil and gas operations.

From the earliest days of the IOGCC, state oil and gas regulatory commissions regulated all aspects of oil and gas operations, and when secondary recovery operations were commenced, it was the state commissions that regulated those oil and gas operations.

In 1974, Congress passed the SDWA. Thereafter, the Environmental Protection Agency (EPA) promulgated regulations to administer the Act. EPA promulgated regulations establishing a classification scheme for injection wells. The EPA regulations covered inter alia “Class II wells,” which were defined to include “enhanced recovery wells.” Although some states did not believe Congress intended the SDWA to cover “enhanced recovery wells,” neither the IOGCC nor any member-states formally challenged the authority of EPA at that time to regulate “enhanced recovery wells.” Consequently, EPA proceeded with the implementation of its UIC Program, granting to certain states primary enforcement authority (“primacy”) over Underground Injection Wells. It appears that the states acceded to the EPA regulatory scheme under the SDWA by complying with EPA regulations that included injection wells used for enhanced oil recovery. This will be discussed again in more detail below.

#### Overview of the Safe Drinking Water Act

In 1974, Congress enacted the SDWA for the purpose of protecting underground sources of drinking water. The SDWA established a regulatory program to protect underground sources of drinking water. The SDWA defined its authority, presently stating “[t]he term ‘underground injection’ means the subsurface emplacement of fluids by well injection; and excludes the underground injection of natural gas for purposes of storage; and the underground injection of fluids or propping agents (other

than diesel fluid) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal production activities.” 42 U.S.C. § 300h-(d)(1) (amended 2005). The SDWA did not address storage of carbon dioxide (CO<sub>2</sub>).

Under the SDWA, injection wells have five classifications. 40 C.F.R. § 144.6. The EPA classification system is summarized in the case of *Legal Environmental Assistance Foundation v. Environmental Protection Agency*:

Class I wells are wells used to dispose of hazardous, industrial, or municipal wastes beneath underground sources of drinking water. 40 C.F.R. § 146.5(a). Class II wells are “[w]ells which inject fluids: (1) [w]hich are brought to the surface in connection with . . . conventional oil or natural gas production . . .; (2) [f]or enhanced recovery of oil or natural gas; and (3) [f]or storage of hydrocarbons.” *Id.* at § 146.5(b). Class III wells are wells which inject for extraction of minerals. Class IV wells are wells used to dispose of hazardous or radioactive wastes into or above underground sources of drinking water. *Id.* at § 146.5(c), (d). Class V wells are “[i]njection wells not included in Classes I, II, III, or IV.” *Id.* at § 146.5(e). Technical criteria and standards for these various classes of wells are contained in 40 C.F.R. pt. 146.

*Legal Environmental Assistance Foundation v. Environmental Protection Agency*, 118 F.3d 1467 (11th Cir. 1997).

This classification scheme does not cover storage of CO<sub>2</sub>.

#### 1980 Amendment to SDWA

After Congress enacted the SDWA, state oil and gas regulatory commissions and the IOGCC realized that the Act must be amended to allow states, through their oil and gas regulatory commissions, to have broad flexibility to implement and administer UIC programs tailored to specific conditions in each state and each project. Congress recognized that the states had the knowledge and experience to regulate oil and gas operations. Congress amended the SDWA in 1980 to provide an alternative for the states to obtain primary enforcement responsibility (“primacy”) for oil and gas UIC programs.

42 U.S.C. § 300h-4. The 1980 amendments give the states the option of primary enforcement responsibility or “primacy” over UIC programs.

The Interstate and Foreign Commerce Committee, to which the 1980 bill (H.R. 8117) was referred, specifically addressed the purpose of the 1980 amendments: “[The bill] provides an alternative means for states to receive primary enforcement authority to regulate underground injection related to oil and gas production and recovery.” H.R. Rep. No. 1348, 96<sup>th</sup> Cong., 2d Sess. (1980), *reprinted in* 1980 U.S.C.C.A.N. 6080, 6081. Furthermore, “[t]he [Interstate and Foreign Commerce] committee . . . proposes to allow any state in lieu of meeting the administrator’s regulations, to assume primacy [enforcement responsibility] for controlling underground injection relating to oil and gas recovery and production by demonstrating that its program meets the requirements of subparagraphs (a) through (d) of section 1421(b)(1) . . . and represents an effective program . . . to prevent underground injection which endangers drinking water sources.” *Id.* at 6084.

EPA Guidance information stated that the 1980 amendments to the SDWA provided an “alternative method for a state to obtain primary enforcement responsibility for those portions of its [UIC] program related to the recovery and production of oil and gas.” 46 Fed. Reg. 27333, 27334 (1981). Furthermore, in the Guidance information, the EPA states, “The 1980 amendments to the Safe Drinking Water Act added a new Section 1425 which provides an alternative means for states to acquire primary enforcement responsibility for the control of underground injection related to the recovery and production of oil and natural gas. . . . EPA is mindful of the fact that, in enacting Section 1425, Congress intended the states be offered an alternative to the detailed requirements

promulgated at 40 C.F.R. Parts 122, 123, 124, and 146, and that state programs to control injections related to oil and gas production be considered on their merits.” *Id.* While EPA’s Guidance suggested procedures and criteria for a “model” state application, it also explicitly recognized that “[a] state may choose to apply in a different form and make demonstrations different from those suggested in this document.” *Id.*

EPA has granted most of the oil and gas commissions primary enforcement responsibility over underground injection under Section 1425 of the SDWA, codified at 42 U.S.C. § 300H-4. For example, on August 2, 1982, EPA granted the Alabama Oil and Gas Board responsibility or “primacy” for its UIC program under Section 1425 of the SDWA, codified at 42 U.S.C. § 300H-4.<sup>1</sup>

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<sup>1</sup> *Injection Wells Utilized for Storage of Liquid Hydrocarbons at Standard Temperature and Pressure-*  
**EPA regulations define a Class II injection well as follows:**

- (1) [Wells which inject fluids] which are brought to the surface in connection with conventional oil or natural gas production and may be commingled with waste waters from gas plants which are an integral part of production operations, unless those waters are classified as hazardous waste at the time of the injection.
- (2) [Wells which inject fluids] for enhanced recovery of oil or natural gas; and
- (3) *For Storage of hydrocarbons which are liquid at standard temperature and pressure.*

40 C.F.R. § 146.5(b) (emphasis added).

Under the EPA classification scheme, Class II injection wells, therefore, include inter alia wells utilized for the storage of *liquid* hydrocarbons. By definition, wells utilized for injection of CO<sub>2</sub> cannot be classified as Class II wells because CO<sub>2</sub> is not a liquid at standard temperature and pressure. However, a well which is not a Class II well, may nevertheless be under the jurisdiction of the SDWA. A well not defined as a Class II injection well can be covered by another well classification. In its letter dated July 5, 2006, EPA states:

**Geologic sequestration of carbon dioxide through well injection meets the definition of “underground injection” in section 1421(d)(1) of the Safe Drinking Water Act. . . . EPA is preparing technical program guidance to assist EPA Regions and Primacy States in permitting those DOE-sponsored pilot projects experimental Class V technology wells. (emphasis added).**

### Use of Carbon Dioxide for Enhanced Recovery Operations

Operators presently utilize CO<sub>2</sub> for injection in enhanced recovery projects in nine states: Texas, Wyoming, Mississippi, Oklahoma, New Mexico, Michigan, Utah, Colorado, and Kentucky. All of the state commissions that regulate enhanced recovery injection have applied for and been granted primacy for Class II wells under the SDWA. Based on the language of the SDWA, the definition of Class II wells, and past practice, it appears that CO<sub>2</sub> injection for enhanced recovery operations is under the jurisdiction of the SDWA.

However, if Congress or EPA determines that the law requires it to regulate geologic storage of CO<sub>2</sub> under the SDWA, the IOGCC Task Force has and continues to recommend strongly that EPA promulgate regulations establishing a new classification for the storage or “sequestration” of CO<sub>2</sub>. This activity simply does not fit within the current classification scheme, and a new classification for the geologic storage of carbon dioxide must be established.

### Storage of “Natural Gas” Excluded

The SDWA expressly “excludes the underground injection of natural gas for purposes of storage.” The question arises whether CO<sub>2</sub> is a “natural gas” under this definition. The SDWA does not define natural gas. Authorities can be found on both sides of the question whether the natural gas storage exclusion would include geologic storage of CO<sub>2</sub>.

In the case of *Amoco Production Co. v. Wyoming*, the Wyoming Supreme Court held that the technical definition of “natural gas,” which included carbon dioxide, was to

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be applied and therefore the Wyoming Legislature intended CO<sub>2</sub> to be considered “natural gas.” *Amoco Production Co. v. Wyoming*, 751 P.2d 379 (Wyo. 1988). In its decision, the court quoted several authorities for definitions of natural gas. The *Kirk-Othmer Encyclopedia of Chemical Technology* states:

[n]atural gas is defined as a naturally occurring mixture of hydrocarbon and non-hydrocarbon gases found in the porous geologic formations beneath the earth’s surface, often in association with petroleum. To obtain a marketable product, the raw natural gas flowing from gas or oil wells must be processed to remove water vapor, inert or poisonous constituents, and condensable hydrocarbons. The processed gas is principally methane, with small amounts of ethane, propane, butane, pentane, carbon dioxide, and nitrogen.

*Amoco*, 751 P.2d at 383 (quoting 11 *Kirk-Othmer Encyclopedia of Chemical Technology* 630 (3rd ed. 1980) (emphasis added)).

The Wyoming Supreme Court also quoted *Standard Definitions for Petroleum Statistics* which states “[n]atural gas as a mixture of hydrocarbon compounds and small quantities of various non-hydrocarbons existing in the gaseous phase or in solution with oil in natural underground reservoirs at reservoir conditions. . . .” *Id.* at 383 (quoting *Standard Definitions for Petroleum Statistics*, Technical Report No. 1, (3rd ed.) (Published by the American Petroleum Institute). Williams and Meyers’ *Manual of Oil and Gas Terms* provides a broad definition of “natural gas” that includes carbon dioxide.<sup>2</sup>

The Federal Energy Regulatory Commission [hereinafter referred to as “FERC”] concluded in one of its decisions that CO<sub>2</sub> is not included in the definition of natural gas. *Cortez Pipeline Co.*, 7 FERC P 61024 (1979). The commission recognized that “the term

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<sup>2</sup> “The ordinary rarefied or gaseous hydrocarbons found in the earth are referred to generally as ‘natural gas.’ Non-combustible natural gases occurring in the earth, such as carbon dioxide, hydrogen sulphide, helium and hydrogen, are generally referred to by their proper chemical names. Often, however, non-combustible gases are found in combination with combustible gases and the mixture is referred to generally as ‘natural gas,’ without any attempt to distinguish between the combustible and non-combustible gases.” *citing* Pruitt, “Mineral Terms – Some Problems in Their Use and Definition,” 11 *Rocky Mt. Min. L. Inst.* 1 at 16 (1966).

‘natural gas’ has two fundamentally different meanings. In the terminology of chemistry, ‘natural gas’ would mean any gas occurring naturally, including such gases as helium and carbon dioxide. The common meaning of ‘natural gas,’ however, is a mixture of hydrocarbons, each one having a different chemical composition, but each one being volatile or having certain vapor tension. The non-combustible natural gases, such as carbon dioxide, are often produced in combination with combustible gases and the mixture is often referred to as ‘natural gas,’ without any attempt to distinguish between the combustible and non-combustible gases.” *Id. (citations omitted)*. In applying the Natural Gas Act, FERC concluded “[i]t seems likely that Congress used the common meaning of ‘natural gas’ of a mixture of gases, including a sufficient component of hydrocarbons to give heating value.”

The Tenth Circuit Court of Appeals, in *Arco Oil and Gas Company v. Environmental Protection Agency*, 14 F.3d 1431 (10<sup>th</sup> Cir. 1993), addressed whether Arco’s production of CO<sub>2</sub> fit the meaning of “conventional oil or natural gas production” to determine whether the injection well receiving waste from the CO<sub>2</sub> production should be classified as Class I or Class II. Arco argued that the CO<sub>2</sub> production was the production of ‘natural gas.’ The court concluded that the term “natural gas” was ambiguous, and “that neither the language of the SDWA nor the relevant legislative history reveals a clear congressional intent to treat carbon dioxide as ‘natural gas’ within the meaning of the Act.” *Arco* at 1436. Under the relevant standard of review, the court deferred to the EPA and found that “the agency’s interpretation of ‘natural gas’ as excluding carbon dioxide to be permissible and consistent with the purpose and policy of the SDWA.” *Id.*

## Clarification that Hydraulic Fracturing is Not Under the SDWA

Congress recently amended the SDWA to address its authority. In 2005, with the support of the IOGCC, Congress amended the definition of “underground injection” to clarify that hydraulic fracturing operations are not covered by the SDWA. By this amendment, Congress clarified that these operations are, therefore, under the states’ authority. The 2005 amendment to the SDWA “excludes the . . . underground injection of fluids or propping agents (other than diesel fuel) pursuant to hydraulic fracturing operations related to oil, gas, or geothermal activities.” 42 U.S.C. § 300h(d)(1) (amended 2005).

## SDWA Applies to “Fluids”

Under the SDWA, “underground injection” is defined as “the subsurface emplacement of *fluids* by well injection.”(emphasis added). “Fluid” is defined as “a substance as a liquid or gas that is capable of flowing . . . *Random House Dictionary*. EPA regulations define "fluid" as "any material or substance which flows or moves whether in a semisolid, liquid, sludge, gas, or any other form or state". *See e.g.* 40 C.F.R. §144.3. Arguably, because CO<sub>2</sub> is a gas at standard temperature and pressure, CO<sub>2</sub> is not subject to the SDWA. This interpretation would appear contrary to the generally accepted definition and the regulatory definition to which courts would be expected to defer.

## Summary of Analysis of SDWA

In summary, the current law is that:

- (1) The states, through their oil and gas regulatory commissions, have authority over primary oil and gas operations and almost a century of regulatory experience.
- (2) The federal SDWA appears to cover enhanced recovery, with the states having the option to request primary enforcement responsibility for enhanced recovery operations.
- (3) The states regulate underground storage of natural gas. Most states have passed legislation addressing storage of natural gas. The federal SDWA expressly exempts underground storage of natural gas.
- (4) The SDWA does not address carbon sequestration.

State oil and gas regulatory commissions are the principal authorities regulating oil and gas operations. The states are experienced, flexible, and have the interest of ensuring that their oil and gas and other natural resources are developed safely with proper conservation techniques.

The SDWA exempts storage of natural gas. However, SDWA does not state whether “storage of natural gas” includes carbon dioxide. While the law may be ambiguous over whether the SDWA covers storage of CO<sub>2</sub>, courts, upon finding such an ambiguity, will turn to congressional history and agency determinations on the issue, and

those determinations are generally upheld if they are consistent with the purpose and policy of the legislation in question. *Arco Oil and Gas Company v. Environmental Protection Agency*, 14 F.3d 1431 (10<sup>th</sup> Cir. 1993).

Obviously, Congress did not contemplate geologic storage, or “sequestration,” of carbon dioxide at the time the SDWA was enacted. Therefore, the Act does not address storage of carbon dioxide and does not require that EPA regulate it. As stated above, underground storage of natural gas is expressly exempted from the Act. Because CO<sub>2</sub> is a compound produced in association with natural gas, arguably, storage of CO<sub>2</sub> also is exempt. To date, EPA’s interpretation of the Act would not appear to support this argument.

The SDWA does not require EPA to regulate storage of carbon dioxide. Under SDWA and the *Arco* decision, it is probable that the courts would defer to a decision by EPA to regulate or not to regulate geologic storage of carbon dioxide. Consequently, in the absence of a statutory mandate requiring EPA to regulate CO<sub>2</sub> storage operations under the SDWA, there is nothing to prevent a state from enacting a regulatory framework to address CO<sub>2</sub> storage operations without federal approval.

To facilitate the timely development of CO<sub>2</sub> storage operations in order to mitigate climate change, the states have a responsibility to enact regulatory frameworks to oversee these operations. To facilitate further this development and to provide unequivocally authority to the states to regulate the geologic storage of CO<sub>2</sub>, the SDWA should be amended to provide clearly for this authority.