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SUMMARY

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Class VI Carbon Sequestration Wells: Permitting and State Program Primacy

The U.S. Environmental Protection Agency (EPA) regulates wells used for underground injection of carbon dioxide, known as Class VI wells. The Safe Drinking Water Act (SDWA), administered by EPA, prohibits underground injection of fluids without a permit, including underground injection of carbon dioxide for geologic sequestration. Under SDWA, EPA is authorized to delegate primary enforcement authority, or *primacy*, for underground injection control (UIC) programs to individual states that meet minimum UIC program requirements. As the number of carbon capture and sequestration (CCS) projects using deep well injection has increased in the United States in recent years, Class VI permitting and state program primacy have been topics of interest to Congress.

EPA has established minimum permitting requirements for Class VI injection wells and for state UIC programs. Requirements are specified for well siting and construction, operation and maintenance, monitoring and testing, reporting and recordkeeping, site closure, financial responsibility, and post-injection site care. The minimum contents of a permit are established in regulation, but each Class VI permit is developed and approved based on the site-specific characteristics of the injection well project and is designed to address potential leakage or endangerment of underground sources of drinking water.

Currently, there are 4 federal EPA-permitted Class VI wells in Illinois and Indiana, and at least 11 state-permitted Class VI wells in operation in the United States. According to EPA, 130 Class VI permits are currently pending review by the agency. Additional permits are under review by three states with delegated authority for state Class VI UIC programs.

Class VI permits are required to include information about the project and underground formations, demonstrate site suitability, and provide financial assurances. Permits must also include six required plans that provide detail on how the owner or operator will conduct injection well activities throughout the project lifecycle of the project. When reviewing permit applications, the permitting authority (either EPA or a state) typically conducts five stages of review: completion review, technical review, draft permit, public comment, and final permit. The technical review, which involves evaluation of information and plans in the application package, is the longest and most complex step in the permitting process. Once the permit is in place, the permitting authority is responsible for ensuring the permit requirements continue to be met.

EPA has approved UIC Class VI program primacy for three states: North Dakota, Wyoming, and Louisiana. When granted primacy for a class of UIC wells, a state administers that UIC program through enforcement of state laws and regulations in lieu of EPA regulations. EPA retains oversight authority over all state UIC programs under federal law. EPA UIC regulations set out the specific requirements for state programs in permitting, compliance evaluation, enforcement, and information sharing. A state must demonstrate that it has the legal authorities and processes in place to administer the Class VI program. A memorandum of agreement between a state with primacy and EPA, which is submitted along with other required documents, typically serves as the foundation of a state's specific responsibilities and commitments in administering the Class VI program.

Congress has appropriated funding in recent years to EPA for implementation of federal and state Class VI programs. In 2021, the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) provided $50 million in supplemental appropriations to EPA for grants to states that have or are working toward Class VI primacy. The IIJA provided an additional $25 million to EPA for Class VI program administration. As Congress continues to debate policy on Class VI well permitting and state primacy, several issues may arise regarding Class VI wells, including EPA appropriations, legislation, and EPA oversight. Specific policy issues may include

- the levels of EPA resources needed to process and oversee Class VI permits and state primacy applications;
- state resources and capacity to administer UIC Class VI programs;
- whether EPA's Class VI regulations should be amended; and
- whether Congress should address stakeholder concerns about public participation in permit and primacy processes, and concerns about the potential environmental and community impacts of carbon sequestration through Class VI wells.

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Introduction

Several industries in the United States are expanding the use of injecting captured carbon dioxide (CO_2) through deep underground wells into geologic formations in order to reduce CO_2 emissions reaching the atmosphere. As one potential option for mitigating the potential impacts of climate change, this carbon capture and sequestration (CCS) process could reduce the amount of CO_2—an important greenhouse gas—from power plants and other large industrial facilities. The U.S. Environmental Protection Agency (EPA) issues permits for CO_2 injection wells, known as *Class VI wells*, used for injection and geologic sequestration of CO_2. In some cases, EPA delegates authority to states, known as *program primacy*, to administer underground injection programs and issue Class VI permits.

In recent years, Class VI permitting and state program delegation has been a topic of interest to Congress. Congress provided targeted appropriations for Class VI well activities in the Consolidated Appropriations Act, 2021 (P.L. 116-260). The act also directed EPA to provide recommendations to "improve Class VI permitting procedures."[1]

In 2022, EPA responded with a report to Congress on Class VI permitting.[2] Some Members have continued to express interest in Class VI well permitting and primacy issues, including the current status of applications, EPA review processes, public participation in applications, and options for increasing the numbers of approved well permits and state delegation applications.

This report discusses the statutory and regulatory framework for permitting Class VI wells; describes Class VI permit application requirements and the permit review process; describes state primacy requirements and the primacy review process; and highlights selected policy issues for Congress.

Other environmental regulations and permit requirements may apply to projects injecting CO_2, depending on the scope and purpose of the project, such as requirements under the Clean Air Act and Clean Water Act administered by EPA. EPA also regulates injection of CO_2 for crude oil production (in a process known as enhanced oil recovery) through Class II UIC injection wells.[3] These regulations and permits are beyond the scope of this report. For more information on CO_2 injection and sequestration, including the federal statutory and regulatory framework, and general policy issues, see CRS Report R46192, *Injection and Geologic Sequestration of Carbon Dioxide: Federal Role and Issues for Congress*, by Angela C. Jones.

Class VI Injection Wells

As part of the CCS process, CO_2 is first captured from a stationary source, such as a coal-fired power plant or chemical production facility. The CO_2 is then injected into subsurface geologic formations for *geologic sequestration*, the long-term containment of a fluid (including a gas, liquid, or supercritical CO_2 stream) in subsurface geologic formations.[4]

[1] P.L. 116-260, Division G, Title II, Environmental Protection Agency.

[2] U.S. Environmental Protection Agency (EPA), *EPA Report to Congress: Class VI Permitting*, October 2022, https://www.epa.gov/system/files/documents/2022-11/EPA%20Class%20VI%20Permitting%20Report%20to%20Congress.pdf (hereinafter, *EPA Report to Congress*).

[3] Through multiple injection cycles into the underground formation, injection of CO_2 for enhanced oil recovery (EOR) results in incidental underground storage of some of the injected CO_2.

[4] CO_2 for injection is initially captured as a gas and then is compressed into a supercritical fluid, a relatively dense fluid (continued...)

The CO_2 is injected through Class VI wells, typically injecting fluid a half a mile or more below the earth's surface. Geologic formations used for injecting CO_2 include, for example, large deep saline reservoirs (underground basins containing salty fluids) and oil and gas reservoirs no longer in production.

The Safe Drinking Water Act (SDWA), administered by EPA, provides authorities for regulating the underground injection of fluids.[5] SDWA prohibits any underground injection activity, except when authorized by a permit or rule, to prevent endangerment of underground sources of drinking water (USDWs).[6] As part of EPA's Underground Injection Control (UIC) program, the agency has promulgated regulations and established minimum federal requirements for injection wells, including for Class VI wells for the purpose of long-term geologic sequestration.[7]

SDWA also authorizes EPA to delegate primary enforcement authority, called *primacy*, of UIC programs to states (see "State UIC Class VI Program Primacy" below). As directed by SDWA, EPA has established minimum requirements for state UIC programs and permitting for injection wells.[8] EPA has delegated primacy for the state UIC Class VI programs in North Dakota, Wyoming, and Louisiana.

Class VI Well Permits

Federal requirements for injection well permits, including Class VI well permits, are codified in UIC regulations at 40 C.F.R. §§144-146. Minimum requirements are specified for well siting and construction, operation and maintenance, monitoring and testing, reporting and recordkeeping, site closure, financial responsibility, and post-injection site care. The well owner or operator must seek a permit for each individual Class VI well.[9]

Each UIC Class VI permit is specific to the characteristics of the individual injection site and operation. Site-specific permitting is necessary to address the risks of CO_2 injection at high pressures, such as leaks into the atmosphere, underground leaks, or movement of formation water into USDWs that could affect drinking water quality.

Class VI permit requirements and standards are generally more stringent than requirements for other well classes. EPA based the regulation and permitting requirements of Class VI wells on several risk factors specific to this type of injection activity. These risk factors include the large volumes of CO_2 expected to be injected through wells, the mobility of CO_2 within subsurface

with both gas-like and liquid-like properties. An emerging technology that captures CO_2 directly from the atmosphere—called direct air capture—could also provide a source of CO_2 for geologic sequestration. For more information on carbon capture and direct air capture, see CRS In Focus IF11501, *Carbon Capture Versus Direct Air Capture*, by Ashley J. Lawson.

[5] SDWA Part C, "Protection of Underground Sources of Drinking Water" (42 U.S.C. §§300h-300h-9).

[6] SDWA §1421; 42 U.S.C. §300h. EPA defines *underground source of drinking water* as an "aquifer or its portion which supplies any public water system or which contains a sufficient quantity of ground water to supply a public water system; and currently supplies drinking water for human consumption; or contains fewer than 10,000 mg/l total dissolved solids; and which is not an exempted aquifer" (40 C.F.R. §146.3).

[7] EPA has established six "classes" of underground injection wells, based on the types of fluids injected; 40 C.F.R. §§144-146; EPA, "Federal Requirements Under the Underground Injection Control (UIC) Program for Carbon Dioxide (CO_2) Geologic Sequestration Wells; Final Rule," 75 *Federal Register* 77230-77303, December 10, 2010, p. 77245. (Hereinafter, "EPA, Federal Requirements.")

[8] 40 C.F.R. §§144-146.

[9] SDWA regulations for some other UIC well classes allow wells to be permitted in groups, known as "area permits."

formations, and the corrosive properties of CO_2 in the presence of water that can affect well materials.[10]

To assist states and owners/operators with the permitting process, EPA has issued 11 technical guidance documents on Class VI wells.[11] These documents are not legally enforceable, but they provide additional information on site characterization, area of review, construction, reporting and recordkeeping, site closure, financial responsibility, and other permit elements.

Class VI Permit Phases

During the Class VI well permit application process, the owner or operator works with the permitting authority, either EPA or a state that has primacy for the Class VI UIC program. EPA identifies four phases of permitting for a Class VI project:[12]

1. **Pre-construction.** The permitting authority reviews geologic, underground formation, hydrogeologic, engineering, and financial information about a proposed Class VI project to confirm site suitability. The permitting authority then develops a draft permit.
2. **Pre-operation.** Following well testing and submission of additional site information, the permitting authority confirms the adequacy of well construction and makes a determination regarding authorization to inject CO_2.
3. **Injection.** After granting an authorization to inject, the permitting authority confirms that the well and the project are operating in compliance with the permit and that USDWs are not endangered.
4. **Post-injection.** After injection is complete, the well is plugged, and the site is closed, the permitting authority verifies that the project continues to be protective of USDWs and that the injection and monitoring wells at the site will not endanger USDWs after site closure.

Class VI permits extend for the operating life of the facility and a 50-year post-injection site care period.[13] The duration of a Class VI well injection project varies depending on the amount of CO_2 captured for storage and the capacity of the underground formation, but current projects estimate a 10- to 15-year timeframe for injection. Permitting authorities are required to review Class VI permits at least once every five years.[14]

Elements of a Class VI Permit

For EPA-issued Class VI permits, 40 C.F.R. Parts 144 and 146 set out specific requirements for the permit application and approval process. While the minimum contents of a permit are established in federal regulation, the site-specific permit conditions, technical standards, and other requirements in each permit are based on the permitting authority's evaluation of the potential risks to USDWs and the necessary conditions and standards required for the project to prevent and manage potential endangerment of USDWs. Permits are updated based on site or project

[10] EPA, "Federal Requirements," p. 77234.

[11] "Class VI Guidance Documents," EPA, https://www.epa.gov/uic/class-vi-guidance-documents.

[12] *EPA Report to Congress*. For more details on permitting requirements and guidelines, see "Class VI Guidance Documents."

[13] 40 C.F.R. §144.36.

[14] Ibid.

circumstances. States must have equivalent requirements if administering their own UIC Class VI programs and issuing Class VI permits (see "State UIC Class VI Program Primacy").

General Project Information and Permit Conditions

Class VI permit applicants are required to include general project information and set out the permit conditions applicable to all UIC permits, as well as Class VI-specific permit criteria and standards.[15] Injection project information includes

- basic facility and siting information;
- detailed information on the CO_2 stream;
- geochemical data on subsurface formations, including relevant USDWs;
- detailed information on the geologic structure and hydrogeologic properties of the storage site and overlaying formation; and
- the history of seismic activity at the site.[16]

Class VI permits applications are also required to

- identify the area of review for the project that accounts for the physical and chemical properties of CO_2;
- demonstrate that the injection site is in a suitable geologic formation for geologic sequestration;
- document that the materials used for well construction are adequate to prevent movement of fluids into or between USDWs and are suitable for long-term contact with CO_2 for the life of the project;[17] and
- include the owner's or operator's financial assurances in the form of financial responsibility instruments to cover corrective action, injection, well plugging, post-injection site care, and any emergency and remedial response that meets the regulatory requirements of those actions.[18]

For more information on Class VI well standards and permitting requirements, see CRS Report R46192, *Injection and Geologic Sequestration of Carbon Dioxide: Federal Role and Issues for Congress*, Appendix C.

Required Plans

Class VI regulations require that permit application packages include several plans that provide detailed information on how the owner or operator will conduct injection well activities from construction through closure.[19] These plans are finalized and approved by the permitting authority as part of the permitting process. The following plans are required in a permit application:

- Testing and Monitoring Plan
- Injection Well Plugging Plan
- Site Closure Plan and Post-Injection Site Care Plan

[15] 40 C.F.R. §144.51; 40 C.F.R. §§144.82-146.95.

[16] 40 C.F.R. §144.82.

[17] 40 C.F.R. §144.83; §144.84; §144.86.

[18] 40 C.F.R. §144.85.

[19] 40 C.F.R. §144.82.

- Corrective Action Plan
- Emergency and Remedial Response Plan
- Quality Assurance Surveillance Plan

Optional Injection Depth Waiver

By regulation, Class VI wells are defined as wells that are used for the geologic sequestration of CO_2 *beneath the lowermost formation containing a USDW* (emphasis added).[20] In some cases, the USDWs may be deep in the formation. In these cases, during the permitting process, well owners or operators may seek a waiver to allow injection into non-USDWs above or between USDWs. Class VI regulations include specific requirements for approval of a depth waiver, such as the information to be provided to the state or EPA, consultations with state Public Water System Directors and tribes, public notice, and approval or concurrence by the EPA Regional Administrator.[21]

Class VI Permitting Process

Class VI permit regulations require that an owner or operator submitting a permit application package meet specific requirements and follow certain processes. Once an applicant submits a permit application to EPA, that application is reviewed by staff in the EPA regional office covering that state. While EPA has stated that its objective is to complete the permit review process within two years, review times may vary due to differences in the initial completeness of the application, timing of revisions by the applicant, the public comment process, agency review capacity, and other factors.[22]

EPA's Class VI permit application review process includes five steps, listed below.[23]

1. **Completeness Review**—determination by EPA that the permit application package meets requirements for completeness and necessary information.
2. **Technical Review**—detailed review of the application by EPA to ensure the project will not endanger USDWs.
3. **Draft Permit**—preparation of the draft permit by EPA specifying conditions of well construction and operation.
4. **Public Comment**—opportunity for the public to review and comment on the draft permit through written comments to EPA or requests for a hearing conducted by EPA.
5. **Final Permit**—preparation of final permit and authorization to construct or convert the injection well, construct monitoring wells, and perform required testing.

Once construction and testing are completed and approved, the final phase includes an authorization from EPA to inject. At this point, the operator is permitted to begin injecting CO_2.

[20] 40 C.F.R. §144.6(f).

[21] 40 C.F.R. §144.95. State programs with delegated authority may choose whether to offer injection waivers to owners or operators as part of a UIC Class VI program. 40 C.F.R. §146.95(d) requires that the relevant EPA regional administrator concur on approval of an injection depth waiver for a project.

[22] *EPA Report to Congress*.

[23] *EPA Report to Congress*. For more details on permitting requirements and guidelines, see "Class VI Guidance Documents."

The technical review is the longest and most complex step in the permitting process, with an estimated time frame of 18 months.[24] During this step, EPA reviews the detailed siting, construction, operation, injection, and closure information submitted, as well as each of the draft plans required in the application package.

During the review and drafting steps, EPA typically works with the applicant to seek clarification on permit elements and identify additional information required. The permitting authority may issue a formal Request for Additional Information (RAI). Applicants are expected to respond to an RAI within 30 days or provide an alternative timeline for a response.

Permit Compliance and Enforcement

Once the permit is in place, the permitting authority is responsible for ensuring that the owner or operator continues to meet the permit conditions and requirements.[25] The permitting authority reviews testing, monitoring, and verification data reported by the owner and operator to evaluate compliance and enforce permit conditions in place to prevent endangerment of USDWs.

Potential violations include, among others, a loss of well mechanical integrity; failure to follow monitoring, testing, or reporting requirements; or movement of CO_2 or formation fluids out of the designated injection zone. The permitting authority may also conduct on-site inspections to observe well testing and operation, review records, or evaluate procedures being taken to bring the facility into compliance, among other purposes.

Public Participation

Class VI permit application review processes are subject to the general public participation requirements under SDWA.[26] These regulations apply to EPA issuance of UIC permits. They outline minimum requirements for public information, public notice, and public consultation. Public participation activities may include providing notice in the media, holding hearings, responding to public comments, and involving stakeholders.

While the above general public participation requirements exist, EPA has not issued specific regulatory requirements for public participation for the Class VI permit application process. EPA guidance on public participation in Class VI permitting, issued in 2011, anticipated "high levels" of public interest in geologic sequestration.[27] The guidance encouraged UIC programs and owners and operators to provide information on Class VI permits early in the process and to involve a broad range of stakeholders.[28]

In its 2022 report to Congress on Class VI well permitting, EPA identified several stakeholder concerns regarding environmental justice (EJ) in the permitting process, including concerns about project siting and public involvement. EPA stated that the agency intends to expand the amount of

[24] "Class VI—Wells Used for Geologic Sequestration of Carbon Dioxide," EPA, https://www.epa.gov/uic/class-vi-wells-used-geologic-sequestration-carbon-dioxide.

[25] The permitting authority is either EPA or a state granted UIC Class VI program authority by EPA.

[26] 40 C.F.R. Part 25. 40 C.F.R. §§124.10-124.11 requires the permitting authority to provide public notice of the permit application, hold a public hearing if it is determined to be of significant public interest, and consider public comments in making permit decisions.

[27] EPA, *Geologic Sequestration of Carbon Dioxide – UIC Quick Reference Guide: Additional Considerations for UIC Program Directors on the Public Participation Requirements for Class VI Injection Wells*, EPA 816-R-11-001, June 2011, https://www.epa.gov/sites/default/files/2015-07/documents/uic-quick-reference-guide_public-participation_final-508.pdf.

[28] EPA, *Geologic Sequestration of Carbon Dioxide – Quick Reference Guide*.

information available to the public about Class VI well permit applications and "explore additional ways in which EPA Class VI permitting can consider the specific needs of any EJ communities located near a proposed Class VI project."[29]

In August 2023, EPA issued a memorandum and accompanying guidance that outlined expectations for how agency staff should consider EJ in permitting and primacy evaluations.[30] The guidance notes that, while Class VI wells are regulated under an "existing, rigorous" permitting framework, stakeholders have raised concerns about the potential impacts of Class VI well projects on "overburdened communities."[31] Specifically, the guidance includes information for EPA and state UIC programs on identifying communities with potential EJ concerns, enhancing public involvement during the permitting applications processes, conducting EJ assessments of potential well projects, and enhancing transparency in the permitting process.[32]

Class VI Well Permits Issued

As of March 2024, EPA has issued a total of eight Class VI permits for injection of CO_2. Four EPA-permitted Class VI wells are currently in operation.

- In 2015, EPA issued four Class VI permits associated with the FutureGen project in Illinois, but the project was cancelled before well construction.
- In 2017, EPA issued final permits for two wells injecting CO_2 into a saline aquifer at the Archer Daniels Midland (ADM) ethanol plant in Decatur, Illinois.[33]
- In 2024, EPA issued permits for two wells at Wabash Carbon Services in Indiana, which plan to store captured CO_2 from offsite fertilizer production.[34]

Two of the three states with Class VI permitting authority have issued permits:

- North Dakota has issued eight Class VI permits for three facilities for injection of CO_2.[35]
    - The Red Trail Energy (RTE) storage facility was permitted in 2022. RTE injects CO_2 captured from ethanol production facilities.
    - The Dakota Gasification Company (DSG) storage facility was permitted in 2023. DSG injects CO_2 captured from a natural gas production facility.
    - The Blue Flint storage facility was permitted in 2023. Blue Flint injects CO_2 captured from ethanol production facilities.

[29] *EPA Report to Congress*.

[30] EPA, *Environmental Justice Guidance for UIC Class VI Permitting and Primacy*, August 17, 2023, https://www.epa.gov/system/files/documents/2023-08/Memo%20and%20EJ%20Guidance%20for%20UIC%20Class%20VI_August%202023.pdf (hereinafter, EPA, *Environmental Justice Guidance*).

[31] Ibid.

[32] Ibid.

[33] EPA, "Table of EPA's Draft and Final Class VI Well Permits," https://www.epa.gov/uic/table-epas-draft-and-final-class-vi-well-permits, accessed April 1, 2024.

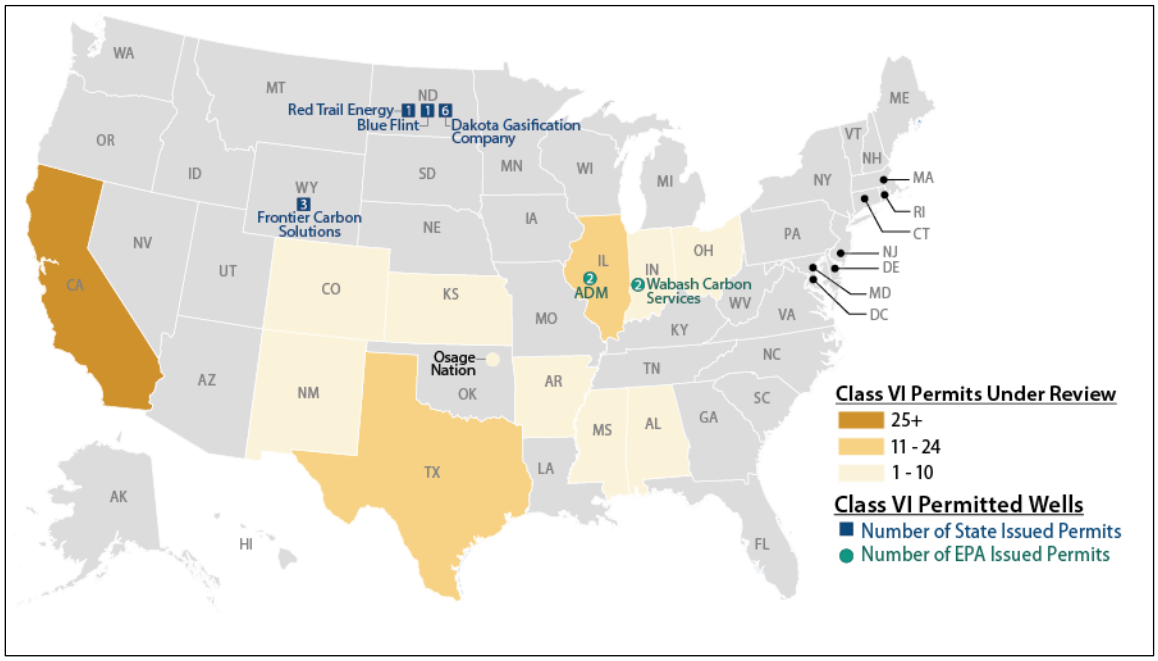
[34] EPA, "EPA Approves Permits to Begin Construction of Wabash Carbon Services Underground Injection Wells in Indiana's Vermillion and Vigo Counties," news release, January 24, 2024, https://www.epa.gov/newsreleases/epa-approves-permits-begin-construction-wabash-carbon-services-underground-injection.

[35] North Dakota Department of Mineral Resources, "Class VI – Geologic Sequestration Wells," https://www.dmr.nd.gov/dmr/oilgas/ClassVI, accessed December 7, 2023.

- In 2023, Wyoming issued three Class VI permits to the Frontier Carbon Solutions project for a storage hub that would store CO_2 from various capture projects.[36]
- Louisiana has not yet issued Class VI permits.

According to EPA, as of April 2024, 130 Class VI permit applications are pending for 44 projects in 12 states and 1 tribal reservation.[37] All of these permits being reviewed by EPA are in the pre-construction phase as of April 1, 2024. See **Figure 1** for details on permit applications and Class VI well locations.

Figure 1. Class VI Permits Issued and Under Review by EPA



Source: CRS graphic based on U.S. Environmental Protection Agency, "Current Class VI Projects Under Review at EPA," accessed on April 1, 2024, https://www.epa.gov/uic/current-class-vi-projects-under-review-epa.

Note: Figure includes permits under review by EPA as of April 1, 2024. Figure does not include permits that may be under review by states with UIC Class VI program primacy, as these are managed by individual states rather than EPA.

State UIC Class VI Program Primacy[38]

SDWA authorizes EPA to delegate primary enforcement authority for UIC programs, known as *primacy*, to individual states.[39] EPA grants a state primacy through a federal rulemaking process for one or more classes of wells. To be delegated Class VI program primacy, states must adopt laws and regulations at least as stringent as EPA regulations and must meet other statutory

[36] Wyoming Department of Environmental Quality, "Class VI," https://deq.wyoming.gov/water-quality/groundwater/uic/class-vi/, accessed January 11, 2024.

[37] EPA, "Current Class VI Projects Under Review at EPA," https://www.epa.gov/uic/current-class-vi-projects-under-review-epa, accessed April 1, 2024.

[38] This report focuses on requirements for new UIC Class VI programs. Applications for revisions of existing UIC programs may require the state to submit less information, as outlined in "Class VI Guidance Documents."

[39] SDWA §1421; 42 U.S.C. §300h.

and regulatory requirements. UIC regulations allow states to apply for primacy either for the Class VI program only or for multiple UIC well programs at once.

If granted primacy for a UIC program, such as a Class VI well program, a state administers the program through enforcement of state laws and regulations in lieu of EPA regulations. The state administers the UIC program and is responsible for day-to-day program responsibilities, including issuing permits and enforcing permit requirements and standards. Under SDWA, EPA retains oversight of states with primacy to ensure that the state programs comply with federal regulatory requirements.

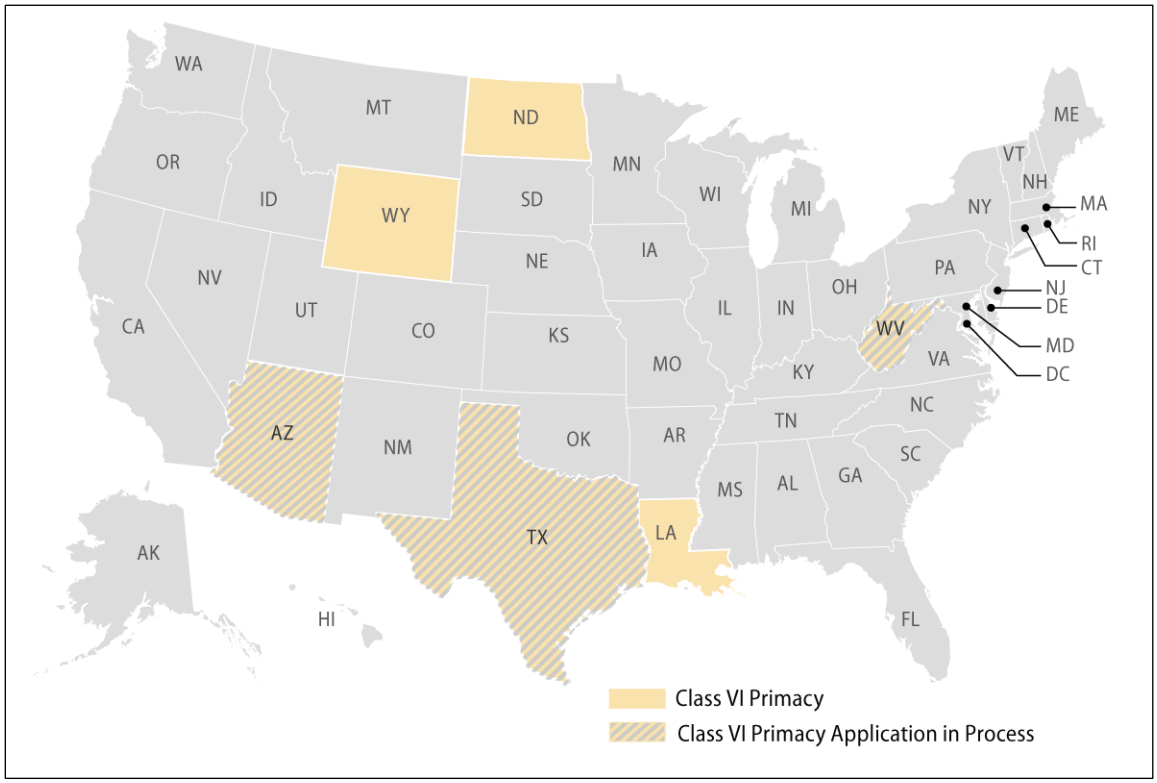
Current States with UIC Class VI Program Primacy

EPA has delegated primacy for Class VI wells to three states: North Dakota (2018), Wyoming (2020), and Louisiana (2023).[40] Additional states are applying for Class VI primacy. As of April 1, 2024, West Virginia and Arizona are in a pre-application phase for all six well classes, including Class VI, and Texas is in a pre-application phase for the Class VI program.[41] See **Figure 2** for a map of states that have been granted UIC Class VI program primacy or are in the application process. As Class VI wells require specific types of geologic conditions and underground formations to receive and store injected CO_2, some states may not have appropriate sites for Class VI wells. These states would not apply for Class VI program primacy.

[40] North Dakota, Wyoming, and Louisiana have primacy for all six UIC well classes. EPA implements Class VI programs in all other states and territories.

[41] EPA, "Primary Enforcement Authority for the Underground Injection Control Program," https://www.epa.gov/uic/primary-enforcement-authority-underground-injection-control-program-0, accessed January 20, 2024.

Figure 2. States with UIC Class VI Program Primacy



Source: CRS graphic based on U.S. Environmental Protection Agency, "Primary Enforcement Authority for the Underground Injection Control Program," https://www.epa.gov/uic/primary-enforcement-authority-underground-injection-control-program-0.

UIC Class VI Program Primacy Requirements

As directed in Section 1421 of SDWA, EPA has established minimum requirements for state UIC programs. If a state seeks primacy for its UIC program, Section 1422 of SDWA requires the state to submit an application "showing satisfactorily" to EPA that, after reasonable notice and public hearings, the state will implement a program that meets the minimum requirements of Section 1421.

EPA UIC regulations promulgated at 40 C.F.R. Part 145 set out the specific requirements for state programs for permitting, compliance evaluation, enforcement, and information sharing. The regulations set out the process and requirements for state applications to EPA for primacy, as well as the procedures EPA follows in evaluating primacy applications.

Class VI regulations require the state to demonstrate that it has the authorities and processes in place to administer the Class VI program, including

- legal authority to implement all permit requirements;
- necessary procedures for the state's compliance evaluation program;
- necessary administrative, civil, and criminal enforcement penalty remedies;
- state Class VI UIC regulations for permitting, inspection, operation, monitoring and recordkeeping, and other requirements at least as stringent as federal Class VI regulations; and

- statewide jurisdiction over underground injection projects.[42]

States seeking primacy are required to submit a detailed description of their UIC program that includes information on

- the structure and processes of the program;
- staffing and expertise;
- schedule and priorities for issuing Class VI permits;
- expected number of permits to be issued; and
- the state's compliance tracking and enforcement program.[43]

A state seeking primacy must submit copies of its UIC statutes and regulations to EPA and must demonstrate that these laws and regulations are at least as stringent as federal UIC requirements.

Other documents required to be included in a primacy application package include

- a letter from the governor of the state requesting program approval;
- a state attorney general statement indicating that the state has adequate legal authority to carry out the UIC program;
- a memorandum of agreement (MOA) between the state and the EPA Regional Administrator that includes provisions on program administration, implementation, and enforcement; and
- documentation of the state's public participation activities prior to submission of the program application.[44]

The MOA typically serves as the foundation of the state's specific responsibilities and commitments in administering the UIC program.

Primacy Application Process

Once a state submits a Class VI primacy application, EPA assesses the completeness of the application and evaluates the contents of the application against federal regulatory requirements. Specifically, EPA examines the stringency and equivalency of the state's regulations in protection of USDWs. According to EPA, the agency maintains a goal of completing the review in 30 days.[45]

In reviewing applications, EPA seeks to ensure that the state's UIC Class VI regulations are at least as strict as federal regulations and that they contain the same necessary requirements for well permitting, construction, operation, recordkeeping, site closure, and other requirements established in federal Class VI regulations. The typical UIC primacy application process involves a series of communications and discussions among state agencies and the relevant EPA regional office during review and evaluation. During the review process, EPA may request additional information or clarification from the state.

[42] 40 C.F.R. §145.

[43] Ibid.

[44] Ibid.

[45] EPA, *Geologic Sequestration of Carbon Dioxide: Underground Injection Control (UIC) Program Directors Class VI Primacy Manual for State Directors*, April 2014, https://www.epa.gov/sites/default/files/2015-07/documents/epa816b14003.pdf. EPA standard operating procedures for Class VI primacy application review include a goal of a 30-day time frame for determining the completeness of the application, but this is not a statutory deadline.

Class VI regulations require that, once EPA determines that a new Class VI primacy application is complete, the agency must hold a public hearing announced through notice in the *Federal Register* and provide information on the availability of the application to the public for review and comment.[46]

Once the application is approved, EPA promulgates a rulemaking finalizing the decision to award primacy to the state for the UIC program. The regulations require that EPA must approve, disapprove, or approve in part the UIC program through a rule published in the *Federal Register*.[47] The three approved state Class VI primacy rules are available in the *Federal Register* and codified in 40 C.F.R. Part 147.[48]

For the three state primacy applications that have been approved to date, the timing from EPA receiving a complete primacy application package to approval has varied. For the first state to apply, North Dakota, the review process took four years. EPA approved Wyoming's primacy in eight months.

For Louisiana, the most recent state to be granted primacy, EPA finalized approval more than two years after a completed submission. In May 2023, EPA published a proposed rule indicating the agency's intent to approve Louisiana's Class VI program revision package and soliciting public comment. In August 2023, Louisiana amended its application to include a new state law related to long-term liability for injection well sites.[49] EPA signed final approval for Louisiana's Class VI primacy on December 28, 2023, effective on February 5, 2024.[50]

Enforcement and EPA Oversight

Once granted primacy, the state is responsible for the day-to-day administration of the program, such as issuing permits, monitoring compliance with state regulations, and leading enforcement actions in the event of violations. Under SDWA, however, EPA retains oversight and enforcement authority over all delegated UIC programs. The MOA between the state and EPA typically includes provisions specifying that EPA will conduct periodic performance evaluations of the state program to ensure that minimum federal requirements are being met.

UIC Grants for States

In recent years, Congress has appropriated funding for EPA to provide grants to states for implementation of new and existing UIC programs, including Class VI programs. For FY2023, EPA's enacted operating plan included $13.16 million for categorical grants for all classes of UIC wells, some of which is available for state Class VI well programs. In 2021, the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58) directed EPA to establish a specific UIC Class VI

[46] 40 C.F.R. §145.31.

[47] Ibid.

[48] EPA, "State of North Dakota Underground Injection Control Program; Class VI Primacy Approval," 83 *Federal Register* 17758-17761, April 24, 2018, and 40 C.F.R. §147.1751 (North Dakota); EPA, "Wyoming Underground Injection Control Program; Class VI Primacy," 85 *Federal Register* 64053-64056, October 2020, and 40 C.F.R. §147.2550 (Wyoming); EPA, "State of Louisiana Underground Injection Control Program; Class VI Primacy," 89 *Federal Register* 703-712, January 5, 2024 (Louisiana), rule signed on December 28, 2023.

[49] EPA, "State of Louisiana Underground Injection Control Program; Class VI Primacy," 89 *Federal Register* 703-712, January 5, 2024 (Louisiana), rule signed on December 28, 2023.

[50] EPA, "Primary Enforcement Authority for Underground Injection Control Program," https://www.epa.gov/uic/primary-enforcement-authority-underground-injection-control-program-0.

grant program for states. Division J of the act provided $50 million in supplemental appropriations to EPA for grants to states that have or are working toward Class VI primacy.

States may use these funds for Class VI primacy applications, program revisions, or existing Class VI program implementation activities.[51] Twenty-three states and two tribes submitted letters of intent to participate in the grant program. EPA has allocated $1.93 million to each of these states and tribes, for a total of $48.25 million of the $50 million in grant funding available.[52]

State Public Participation and Environmental Justice

In December 2022, EPA sent a letter to all state governors regarding environmental justice considerations in Class VI well permitting and state primacy.[53] The letter encouraged states to include approaches for considering the impact of Class VI well projects on vulnerable communities in their primacy applications and in implementation of their state programs once primacy is granted. EPA's August 2023 publication *Environmental Justice Guidance for UIC Class VI Well Permitting and Primacy* provides further guidance for how states can support these objectives.

Issues for Congress

In recent Congresses, some Members have demonstrated interest in Class VI permitting and primacy by introducing legislation specific to Class VI wells, providing targeted appropriations to EPA, and discussing Class VI well issues in hearings.[54] For example, in the 117th Congress, the SECURE Act (H.R. 9230) would have amended IIJA appropriations to increase EPA appropriations for Class VI grants from $50 million to $100 million. In the 118th Congress, the Primacy Certainty Act of 2023 (H.R. 3568/S. 1718) would amend SDWA to require EPA to issue a determination on a state's Class VI primacy application within 90 days.

As Congress continues debate on Class VI well permitting and state primacy, Members may consider several policy issues related to EPA appropriations, legislation, and oversight. While the issues outlined below focus on policies specifically related to Class VI wells, policy support for CCS project deployment, such as research funding and federal tax credits, are part of broader climate change policy discussions in Congress. For more information on policy considerations for Class VI wells and CCS as a climate change mitigation option, see CRS Report R44902, *Carbon Capture and Sequestration (CCS) in the United States*.

EPA Funding and Resources

As discussed in this report, Congress has supported state UIC well programs through regular annual appropriations to EPA for grants to states to be used for UIC program implementation.

[51] EPA, *Underground Injection Control (UIC) Class VI Wells Grant Program: Grant Implementation Document*, November 2023, https://www.epa.gov/system/files/documents/2023-11/uic-class-vi-primacy-grant-implementation-document.pdf (hereinafter, EPA, *UIC Grant Implementation*).

[52] Ibid.

[53] Letter from Michael S. Regan, EPA Administrator, to Governors, December 9, 2022, https://www.epa.gov/system/files/documents/2022-12/AD.Regan_.GOVS_.Sig_.Class%20VI.12-9-22.pdf.

[54] CRS searched Congress.gov with the term "Class VI" to identify relevant legislation in the 116th-118th Congresses. In November 2023, the Senate Committee on Energy and Natural Resources held a hearing on general CCS topics that included discussions of Class VI permitting and primacy.

Congress has also directed additional funding support for Class VI permitting and primacy activities, providing $25 million for EPA Class VI program administration in the IIJA.[55]

EPA is currently reviewing at least 130 Class VI permit applications. Congress may consider how the level of EPA UIC Class VI program resources aligns with some Members' interest in increasing the number and facilitating the prompt processing of Class VI permit and primacy approvals as part of supporting CCS projects.

As discussed in this report, three states currently have Class VI primacy. In 2023, in response to a request from EPA, 23 states and 2 tribes communicated an intent to pursue Class VI primacy. EPA would need sufficient staffing and resources at the headquarters and regional office level to manage the significant increase in primacy applications for review.

If more states were to be granted primacy, there could be a long-term decrease in the number of Class VI permit applications under federal EPA review as these delegated states took on permitting and enforcement responsibility. One consideration for Congress is whether states differ in capacity and expertise to administer all the elements of a Class VI program. For example, some states have regulated deep oil and natural gas-related wells for decades, while other states with smaller numbers or different types of UIC wells have relied on EPA to administer programs. States without experience regulating wells for oil and gas production or complex wells may need additional time and resources to establish state regulations and develop all the program elements needed to administer a state UIC program.

Potential Amendments to the 2010 Class VI Rule

Another consideration for policymakers involves potential amendments to the 2010 Class VI rule that established specific regulations and standards for Class VI wells and permitting. For example, Congress could consider whether to direct EPA to amend the 2010 Class VI rule based on new information available since it was promulgated. Some stakeholders support EPA promulgating revisions to the rule. They note that the rule has been in place for over a decade and that requirements such as monitoring standards, area of review modeling, financial assurances, and individual well permits should be revised to reflect more recent technology and conditions.[56]

In the preamble to the 2010 rule, EPA stated its intention to review the rule every six years.[57] In its 2022 report to Congress, however, EPA stated that it would need additional data from more projects before amending the Class VI rule.[58] As the first permits for an operating facility were issued in 2017, and injection is expected to continue for approximately 10 years for that facility, no Class VI well project has completed its permit cycle from construction and injection through post-injection site care, which occurs once injection and well closure is complete.

Environmental Justice Concerns

In recent years, some stakeholders have raised concerns about the community impacts of carbon capture and sequestration and Class VI well projects. Specifically, they have expressed concerns that the construction and operation of the wells may place additional burdens on certain

[55] P.L. 117-58, Division J.

[56] *EPA Report to Congress*.

[57] EPA, "Federal Requirements," p. 77241.

[58] *EPA Report to Congress*.

communities already facing disproportionate environmental, health, or economic challenges.[59] Congress may consider exploring these concerns, particularly in the context of other policy objectives.

Some stakeholders support changes in public participation in the permitting of Class VI wells and the state UIC Class VI program primacy application process. As discussed earlier in this report, EPA has promulgated regulations on public participation and issued guidance on consideration of environmental justice in Class VI permitting and primacy processes. In its oversight role, Congress may consider issues related to how EPA is implementing relevant public participation regulations and guidance, including actions detailed in the agency's 2022 report to Congress on Class VI permitting.

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[59] For example, see "EPA Grants Louisiana Primacy to Permit CCS Wells, Despite EJ Concerns," InsideEPA.com, December 29, 2023, https://insideepa.com/daily-news/epa-grants-louisiana-primacy-permit-ccs-wells-despite-ej-concerns," and "Biden Officials Face Fierce Opposition as They Defend CCS," InsideEPA.com, January 8, 2024, https://insideepa.com/outlook/biden-officials-face-fierce-environmental-opposition-they-defend-ccs.