

March 28, 2025

California Air Resources Board
1001 I Street
Sacramento, CA 95814

Matthew Botill
Chief, Industrial Strategies Division

RE: Public Feedback for Carbon Capture, Removal, Utilization, and Storage Program (SB 905)

Dear Mr. Botill,

We appreciate the opportunity to comment on CARB's February 27th workshop on carbon capture, utilization, and storage (CCUS) and carbon dioxide removal (CDR), including discussions around market trends, technological readiness, and deployment considerations.

SB 905 directs CARB to create a carbon capture, removal, utilization, and storage program to evaluate, demonstrate, and regulate CCUS and CDR projects and technologies—an important step in establishing a clear, consistent, and science-based regulatory framework. As these technologies move closer to deployment, effective coordination among state and federal agencies, rigorous technical oversight, and early engagement with communities will be critical to their success.

The following responses address several of the key questions posed during the workshop and highlight areas where practical considerations, existing best practices, and technical insights can guide implementation.

Permit and Project Portal

1. Considering it's voluntary to use, what features of the permit portal would increase the likelihood the portal is used by both project developers and permitting agencies?

A portal that facilitates coordination between federal and state agencies would be highly beneficial, particularly since California currently lacks primacy over UIC Class VI wells. While a fully unified permitting process may not be feasible until California gains primacy over UIC Class VI, a well-designed portal can support a parallel process.

CARB may find the approach taken by the Railroad Commission (RRC) a helpful example. The RRC has applied to EPA for primary enforcement authority under UIC Class VI. In the interim, pursuant to statutory authority granted by the Texas legislature, the RRC adopted rules requiring project proponents that submit a UIC Class VI well application to EPA Region 6 for a Texas located geologic sequestration project to also submit a copy to the RRC for its review and approval. See, 16 Tex. Admin. Code §§ 5.201 - 5.207 (2025). By adopting this strategy, the RRC has ensured (1) that it has a role in the permitting of UIC Class VI injection wells in the state of Texas, even absent primacy; and (2) a seamless transition once EPA approves Texas' application for primacy.

In California's case, no state agency has been authorized to seek primary enforcement authority under UIC Class VI. However, SB905 does direct the creation of a carbon capture, removal, utilization, and storage program. Under this authority, CARB could create a program offering project proponents that submit a UIC Class VI well application to EPA for a California located project to submit a copy to CARB to ensure coordination between CARB, EPA Region 9 and other appropriate state agencies. By adopting this strategy, CARB can exercise an appropriate level of coordination in the permitting of UIC Class VI injection wells in the state of California, even absent primacy.

2. Are there examples of existing similar systems (e.g., CEQAnet) that CARB should look to when developing the permit portal?

CEQAnet offers a useful baseline for integrating environmental documentation, but more targeted models such as the Texas example described in response to question 1 may offer a more appropriate blueprint for permitting systems that work in parallel. In addition, CARB has developed a framework under the Low Carbon Fuel Standard (LCFS) and the Carbon Capture and Sequestration Protocol (CCS Protocol) for the review, public notice and, depending on the outcome of the public notice process, approval of low carbon fuel and project pathways that could serve as an example for geologic sequestration projects. (See, e.g., Provisions for Fuels Produced Using Carbon Capture and Sequestration (Cal. Code Regs., tit. 17, § 95490 (2025) and California Air Resources Board (2018), Carbon Capture and Sequestration Protocol (CCS Protocol), Section C.1.1, available at: https://ww2.arb.ca.gov/sites/default/files/2020-03/CCS_Protocol_Under_LCFS_8-13-18_ada.pdf). CARB should also review EPA's Class VI well portal and DOE's permitting tools for other examples of best practices.

3. Are there other considerations that CARB should address when developing the unified permit application?

Even if CARB is not issuing injection permits for geologic sequestration directly, a unified application could streamline coordination across agencies and ensure that interested stakeholders are apprised of the permitting process and afforded opportunities to review and comment on carbon capture, removal, utilization, and storage projects. To ensure rigor and public trust, CARB might consider following the example of the processes used by the CCS Protocol (see, California Air Resources Board (2018), Carbon Capture and Sequestration Protocol (CCS Protocol), Section C.1.1.1., available at: https://ww2.arb.ca.gov/sites/default/files/2020-03/CCS_Protocol_Under_LCFS_8-13-18_ada.pdf) and facilitate third-party technical reviews. In addition, CARB or other relevant agencies could retain experts from California-based institutions such as Stanford, LLNL, and UC Berkeley to conduct independent reviews. Such a review could be expedited at a project proponent's option and payment of an extra permitting fee. These approaches can help maintain a rigorous and robust review of project proponent application and support materials, streamlining the process through improved efficiencies without compromising the review process' integrity. CARB should also consider establishing a process, similar to that already incorporated in the low carbon fuel standard, to provide stakeholders with notice and an opportunity to comment on proposed agency actions.

4. Are there examples of existing public CCUS project databases that we should look to and/or emulate for public reporting on project deployment?

EPA has recently (within the last two years), revamped its UIC Class VI permit tracker. The present UIC Class VI "dashboard" tracks projects currently under review, final permit decisions,

applications for which EPA is awaiting a response to a request for additional information, applications on hold, and other relevant and useful information. The EPA UIC Class VI Permit Tracker is available here: [UIC Class VI Wells Permit Tracker Dashboard](#)

Financial Responsibility

1. In addition to the instruments listed in §146.85 of Title 40, are there other existing financial responsibility instruments CARB staff should consider?

40 CFR 146.85 includes a list of qualifying instruments, i.e., (i) Trust Funds, (ii) Surety Bonds, (iii) Letter of Credit, (iv) Insurance, (v) Self Insurance (i.e., Financial Test and Corporate Guarantee), (vi) Escrow Account and, (vii) Any other instrument(s) satisfactory to the Director. These qualifying instruments must be sufficient to cover the cost of corrective action (if any), injection well plugging, post injection site care and site closure, and emergency and remedial response. The financial responsibility instrument(s) must be sufficient to address endangerment of underground sources of drinking water. Section 7 of the CCS Protocol under the LCFS includes, almost verbatim, the language of 40 CFR 146.85. Other language in both the UIC Class VI rules and CCS Protocol permit project proponents to use a mix of the listed financial instruments (e.g., an insurance policy for certain costs, a letter of credit for other costs, and a bond for yet other costs. See 40 CFR 146.5 (a)(6) and Section 7(a)(6) of the CCS Protocol).

The list of financial responsibility instruments in the UIC Class VI rules and CCS Protocol is already sufficient. In addition, the language in 40 CFR 146.85 (a)(1) and Section 7(a)(1) of the CCS Protocol provide flexibility for the EPA Director or CARB's EO to approve any other instruments that are found satisfactory. We do not suggest any changes to the list of financial responsibility instruments.

2. In addition to the costs listed in §146.85 of Title 40, are there other costs that CARB should consider be covered by the instruments?

CARB's own CCS Protocol already aligns closely with §146.85, covering key cost categories such as corrective action, plugging and abandonment, and post-injection care. However, the requirements could be strengthened by explicitly including:

- Costs for monitoring conducted during injection; and,
- Community engagement costs, such as maintaining websites or other communication methods.

3. What other additions or changes to the existing CFR requirements for financial responsibility should CARB consider and why?

The existing CFR requirements also require financial instruments to include protective conditions of coverage that include at a minimum cancellation, renewal, and continuation provisions, specifications on when the provider becomes liable following a notice of cancellation if there is a failure to renew with a new qualifying financial instrument, and requirements for the provider to meet a minimum rating, minimum capitalization, and ability to pass the bond rating when applicable. These and other requirements under 40 CFR 146.85, which are replicated in the CCS Protocol under the LCFS, provide significant protections to CARB and California taxpayers that projects will maintain a sufficient level of financial responsibility.

Criteria and Toxics Monitoring

1. What project-specific air monitoring are CCUS/CDR developers currently conducting or intending to conduct, if any?

A variety of academic researchers and project proponents are evaluating project specific air monitoring approaches. These approaches include in-zone and shallow soil monitoring. In addition, a key learning from projects is that in-zone monitoring should avoid relying on wells that are within the area where CO₂ is modeled to occur. Penetrations within the area where CO₂ is modeled to occur can provide a pathway for CO₂ to move between subsurface formations (although where monitoring is properly conducted, movement between subsurface formations will not typically result in a release to the atmosphere).

2. What specific criteria pollutants or toxics emissions should be prioritized for monitoring and where along CCUS/CDR project (i.e., capture, transport, injection/utilization)?

Project monitoring plans must be designed to detect compounds found in the carbon dioxide stream intended for injection. Monitoring should be conducted on transportation infrastructure and at the injection site. Monitoring may also be prudent at the capture project but will likely already be required by a project's air permits.

4. Are there examples of existing regulatory monitoring efforts being conducted in other sectors/sources that may be instructive for SB 905?

In addition to air monitoring, CARB should consider incorporating seismic monitoring into its program to ensure that injection does not induce seismicity that may jeopardize the safe, secure, and durable storage of carbon dioxide.

Surface and near-surface based seismicity monitoring systems can provide equivalent accuracy and broader areal coverage without creating additional penetrations into the reservoir. When surface and near-surface based arrays can be demonstrated as accurate, they may be a better option than downhole monitoring, which introduces new penetrations into the storage complex.

A generally accepted guideline for statistical analysis of seismicity is to measure events over a range of two magnitude units to estimate the linear relationship between frequency and magnitude.¹ The CCS Protocol expressly references a magnitude of concern of 2.7, monitoring arrays should be designed to detect seismic events at or above magnitude 0.7. Detected events above this threshold can be used to update the risk of a magnitude 2.7 or larger, based on the established relationship between earthquake magnitude and frequency.² CCS Protocol, Section 4.3.2.3. Seismicity Monitoring.

**The comments to question 4 were developed jointly by the Environmental Defense Fund (EDF) and 1PointFive. Attached are the full comments for improving the CCS Protocol submitted to CARB in 2022.*

¹ Stumpf, M. P. H. and M. A. Porter, 2012, Critical truths about power laws: Science, 335 (6069) p. 665-666.

² Gutenberg, B.; Richter, C. F. Seismicity of the Earth and Associated Phenomena, 2nd ed.; Princeton Univ. Press: Princeton, NJ, 1954

We would like to express our sincere appreciation for the opportunity to offer our insights on CARB's Carbon Capture, Removal, Utilization, and Storage Program. We value the dialogue surrounding these significant matters and look forward to further discussions.

Sincerely,

1PointFive

cc: Liane Randolph, Chair, CARB
Honorable Stevens S. Cliff, Ph.D., Executive Officer, CARB
Rajinder Sahota, Deputy Executive Officer, Climate Change & Research, CARB