PRELIMINARY CONCEPTS OF POTENTIAL REGULATIONS

Concepts for Potential Regulations for Establishing the Carbon Capture, Removals, Utilization, and Storage Program

Note**:** The language and concepts in this discussion draft were developed for the purpose of soliciting stakeholder feedback on potential regulations. These preliminary concepts are intended to help inform the development of an upcoming rulemaking proposal. All draft potential regulations and concepts included in the document continue to be subject to discussion and development consideration, and accordingly may not reflect what is ultimately included in an eventual rulemaking proposal. Similarly, the topics included here may not be exhaustive of what is ultimately included in an eventual rulemaking proposal. This initial focus in this document does not include nature-based strategies that rely solely on natural carbon sequestration or storage. CARB recognizes nature-based climate solutions are essential to achieving California's carbon-neutrality objectives and continues supporting them under Assembly Bill 1757 (Garcia, Chapter 341, Statutes of 2022) and other efforts. The initial focus in this document is meant to advance public engagement on innovation on both carbon capture and storage as well as lesser commonly known carbon dioxide removal mechanisms.

In addition to concept outlines for many potential regulatory code sections CARB staff might propose for adoption in title 17, California Code of Regulations, staff have also included concept boxes to identify areas where feedback on possible concept proposals may be helpful.

In developing these draft concepts, staff reviewed stakeholder feedback received through past SB 905 workshops and information solicitations, best available science, and preexisting terminology and practices. Staff also reviewed existing Federal, State, and local permitting and regulatory requirements that apply to CCUS projects in California that are focused on environmental and health protection. The structure and initial concepts included in this discussion draft are informed by stakeholder feedback and these existing programs and meant to complement, not duplicate or conflict with, existing requirements to ensure that commercial scale geologic storage projects are implemented safely and transparently in California. For example, existing EPA Class VI well requirements are primarily designed to protect underground drinking water, but many provisions included in EPA's Class VI well requirements also help reduce CO_2 leakage risks, which is an important objective of CARB's SB 905 rulemaking effort. Similarly, permitting and CEQA requirements typically already include transparency, monitoring, and reporting obligations, and so the preliminary concepts included herein are focused on leveraging existing requirements to facilitate public access to permit details and information on how project operators are meeting existing permit requirements. Staff welcome feedback on conceptual descriptions of the regulations included herein as well as feedback on how this potential regulation can complement existing environmental and public health protections here in California.

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§ 95700. Purpose.

This document is a preliminary compilation of potential and partial regulation concepts to establish the new Carbon Capture, Removals, Utilization, and Storage (CCUS) Program, per the passing of Senate Bill 905 (SB 905) (Caballero, Chapter 359, Statutes of 2022).

§ 95701. Definitions.

(a) Definitions. For the purposes of this framework, the following definitions will apply:

Regulatory Text Concept for Section 95701 on Definitions.

CARB staff invites the public to provide feedback on the definitions listed here and to share suggestions for any additional definitions that may support clarity, consistency, and effective implementation of future CARB SB 905 regulations. Some definitions are included here for public feedback but ultimately may be more appropriate for inclusion or modification in regulations governing related programs (e.g. the CCS protocol, LCFS, or Cap-and-Invest). As part of the SB 905 regulation development CARB will continue to refine this list of definitions to ensure that the definitions established pursuant to SB 905 complement, but not conflict with, preexisting definitions contained in other related regulations.

Note: Definitions denoted with an asterisk (*) are already included in SB 905 and not subject to change or modification via the rulemaking process.

"Abandoned Well" means a well whose use has been permanently discontinued or which is in a state of disrepair such that it cannot be used for its intended purpose or for observation purposes.[1]

"Area of Review" (see Regulatory Text Concept for Term and Definitions Including Area of Review and Storage Complex)

"Bioenergy with Carbon Capture and Storage (BECCS)" means any energy pathway where carbon dioxide is captured from a biogenic source of energy and permanently stored.[2]

"Biogenic" means, for the purpose of this article, any CDR approach that uses naturally occurring, biogenic carbon fixation to capture carbon dioxide from the atmosphere.

"Biogenic Carbon Storage" means the sequestration of carbon dioxide in biological material, including but not limited to woody biomass, soil organic carbon, wetland sediments, aquatic vegetation, and other biogenic reservoirs.

[1] 40 C.F.R. §146.3 (defining terms under the EPA Underground Injection Control program).
[2] "Bioenergy with Carbon Capture and Storage." International Energy Agency, 25 Apr. 2024, https://www.iea.org/energy-system/carbon-capture-utilisation-and-storage/bioenergy-with-carbon-capture-and-storage

"Bio-oil" means a liquid mixture derived from biomass, including but not limited to fast pyrolysis oil, biocrude, biochar-containing slurries, and other similar organic biomass-based liquids.

"Bio-oil Sequestration" means the conversion of biomass residuals to bio-oil via processes such as fast pyrolysis, followed by injection of the bio-oil into deep geological formations for permanent storage.

"Carbonate Looping" means the regenerative process of reacting carbon dioxide with a metal oxide such as calcium oxide to produce its carbonate form, in order to ultimately re-separate carbon dioxide for storage or utilization.

"Carbon Capture and Storage" or "CCS" means the separation and transport of carbon dioxide to a facility for injection into a geologic reservoir.

"Carbon Capture and Utilization" or 'CCU" means the use of captured carbon dioxide in product or materials that results in either long-term chemical or physical storage or the displacement of fossil-derived resources or mined carbon dioxide.

"Carbon Capture and Utilization Technology" means carbon capture, utilization, and storage technology or equipment used for capturing and sequestering carbon dioxide emissions from industrial, commercial, or energy-related facilities or sources.*

"Carbon Capture, Removal, or Sequestration Project" means a carbon dioxide capture project, a carbon dioxide removal project, or a sequestration project that seeks to provide for the long-term isolation of the carbon dioxide from the atmosphere through storage in a geologic formation.*

"Carbon Capture, Removal, or Storage Sequestration Operator" or "Project operator" means a person owning or operating a carbon dioxide capture, removal, or sequestration project.*

"Carbon Dioxide" means the most common of the primary greenhouse gases, consisting on a molecular level of a single carbon atom and two oxygen atoms.[3]

"Carbon Dioxide Capture" means the process of concentrating carbon dioxide present in flue and/or exhaust gases, or air, via chemical and/or physical separation methods.

"Carbon Dioxide Capture Project" means a project that uses a process to separate carbon dioxide from industrial, commercial, or energy-related sources, other than oil or gas production from a well, and produces a concentrated fluid of carbon dioxide with the intent of preventing emission of the carbon dioxide into the atmosphere.*

"Carbon Dioxide Leakage or CO_2 Leakage" means any movement of stored carbon dioxide out of the storage complex; includes atmospheric and subsurface leakage.[4]

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[3] California Air Resources Board, *Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market B-ased Compliance Mechanisms Regulation*, Appendix A1 (Notice of Public Hearing), Jan. 20, 2026, https://ww2.arb.ca.gov/rulemaking/2026/cap-and-invest2026-.

[4] California Air Resources Board, *Carbon Capture and Sequestration Protocol under the Low Carbon Fuel Standard*, August 13, 2018, https://ww2.arb.ca.gov/resources/documents/carbon-capture-and-sequestration-

"Carbon Dioxide Plume or CO_2 Plume" means the physical extent underground, in three dimensions, of the free-phase and dissolved carbon dioxide stream.[5]

"Carbon Dioxide Removal" means deliberate human activities removing carbon dioxide equivalent from the atmosphere, directly or indirectly, and storing it in geological, biogenic, or marine reservoirs, or in products.

"Carbon Dioxide Removal Project" means a project that uses a process to remove carbon dioxide from the atmosphere.*

"Carbon Dioxide Removal Technology" means carbon capture, utilization, and storage technology or equipment used for capturing and sequestering carbon dioxide emissions from industrial, commercial, or energy-related facilities or sources.*

"Carbon Dioxide Stream" means carbon dioxide that has been captured from an emissions source (e.g., a power plant), plus incidental associated substances derived from the source materials and the capture process, and any substances added to the stream to enable or improve the injection process.[6]

"Carbon Mineralization" means the reaction of carbon dioxide with silicate rocks that are rich in magnesium, calcium, and iron to precipitate carbonate minerals, which can be engineered as a method for permanent geologic carbon dioxide removal.

"Class II Well" means wells used only to inject fluids associated with oil and natural gas production under the Underground Injection Control Program.[7]

"Class V Well" means wells used to inject non-hazardous fluids underground. Most Class V wells are used to dispose of waste into or above underground sources of drinking water.[8]

"Class VI Well" means wells used for geologic sequestration of carbon dioxide under the Underground Injection Control Program.[9]

"Co-Benefits" means positive environmental, public health, and socio-economic impacts accompanying the primary CDR method, including but not limited to biodiversity enhancement, water quality improvement, local air quality benefits, and economic development.

"Concentrated Carbon Dioxide Fluid" means a fluid that contains concentrated carbon dioxide that is proportionately greater than the ambient atmospheric concentration of carbon dioxide.*

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protocol-under-low-carbon-fuel-standard ("LCFS CCS Protocol").

[5] See LCFS CCS Protocol, supra note 4.

[6] See LCFS CCS Protocol supra note 4.

[7] EPA regulates Class II injection wells under the Underground Injection Control (UIC) program via 40 C.F.R. Part 144 and Part 146.

[8] Ibid.

[9] See supra note 7.

“Corporate Parent” means a corporation that directly owns at least 50 percent of the voting stock of the corporation that is the Project Operator; the latter corporation is deemed a subsidiary of the parent corporation.[10]

“Criteria Air Pollutants” means the six outdoor air pollutants for which there is an established California Ambient Air Quality Standard or National Ambient Air Quality Standard. These pollutants include ozone (O_3), particulate matter ($PM_{2.5}$ and PM_{10}), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb).

“Depleted Oil and Gas Reservoir” means reservoirs that do not currently produce oil or gas, and are considered to have no economically recoverable oil or gas with current technology.[11]

“Earthquake” means the event caused by a sudden slip on a fault.[12]

“Earthquake Magnitude” means a number that characterizes the relative size of an earthquake. Magnitude is based on measurement of the maximum motion recorded by a seismograph. Several scales have been defined, but the most commonly used are (1) local magnitude (ML), commonly referred to as "Richter magnitude", (2) surface-wave magnitude (Ms), (3) body-wave magnitude (Mb), and (4) moment magnitude (Mw).[13]

“Enhanced Oil Recovery” means the injection into and storage of carbon dioxide in oil reservoirs contributing to the extraction of crude oil.[14]

“Executive Officer” means the Executive Officer of the California Air Resources Board or his or her delegate.

“Fault” means a surface or zone of rock fracture along which there has been displacement.[15]

“Geochemical” means any CDR approach that uses naturally-occurring neutralization reactions between acidic forms of carbon and alkaline minerals to convert carbon dioxide from the atmosphere into solid carbonate minerals or dissolved bicarbonates.

“Geologic Storage Complex” means one or more geologic storage reservoirs and any associated facilities or infrastructure necessary to convey, inject, or store carbon dioxide streams at the site of a geologic storage reservoir.*

“Geologic Storage Operator” means, for the purpose of this article, a person owning or operating a sequestration project that injection concentrated carbon dioxide fluid into one of the following storage types: depleted oil and gas reservoir, saline aquifer, or mafic and ultramafic rock reservoir.

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[10] See LCFS CCS Protocol supra note 4.
[11] See LCFS CCS Protocol supra note 4.
[12] U.S. Geological Survey. (n.d.). Earthquake Hazards Program. USGS.
[13] Ibid.
[14] See LCFS CCS Protocol supra note 4.
[15] See supra note 1.

"Greenhouse Gas" means carbon dioxide (CO_2), methane (CH_4), nitrogen trifluoride (NF_3), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and other fluorinated greenhouse gases.[16]

"Induced Seismicity" means the occurrence or frequency of earthquakes for which the origin is attributable to human activities.[17]

"Local Air Districts" means any district created or continued in existence pursuant to the provisions of Part 3 (commencing with Section 40000) of Division 26 of the Health and Safety Code.[18]

"Mafic and Ultra-Mafic Reservoir" means mafic and ultramafic rocks that contain highly reactive silicate minerals abundant in metal cations.

"Mandatory Reporting Regulation (MRR)" means California Air Resources Board's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions as set forth in title 17, California Code of Regulations, chapter 1, subchapter 10, article 2 (commencing with section 95100)."Marine Carbon Dioxide Removal" means anthropogenic interventions that increase net ocean uptake of atmospheric carbon dioxide and carbon storage . Processes can be biological, chemical/physical, or hybrid, and aim to achieve permanent or long-term marine carbon storage.

"Marine Carbon Storage" means the sequestration of carbon dioxide in dissolved bicarbonate in the ocean or other bodies of water, usually occurring through the addition of alkalinity to terrestrial or marine ecosystems.

"Microseismicity" means an earthquake that is typically not "felt" by the public and has an earthquake magnitude of 2.0 or less.[19]

"Plugging and Abandonment" means installing a watertight, gastight seal in a borehole or well to prevent movement of fluids; it may be mechanical or composed of cement or other materials capable of zonal isolation.[20]

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[16] See supra note 3.
[17] U.S. Geological Survey, Communications & Publishing. (2016, March 28) https://www.usgs.gov/communications-and-publishing/news/earthword-induced-seismicity
[18] Cal. Health & Safety Code § 40000 et seq. (Part 3, commencing with § 40000, Division 26—Air Resources)
[19] International Energy Agency Greenhouse Gas R&D Programme. (2022). Current state of knowledge regarding the risk of induced seismicity at CO_2 storage projects (Technical Report 2022-02). https://ieaghg.org/publications/current-state-of-knowledge-regarding-the-risk-of-induced-seismicity-at-co2-storage-projects/
[20] *Geologic Sequestration of Carbon Dioxide: Underground Injection Control (UIC) Program Class VI Well Plugging, Post-Injection Site Care, and Site Closure Guidance*. EPA 816-R-16-006, December 2016. U.S. Environmental Protection Agency, https://www.epa.gov/sites/default/files/2016-12/documents/wp-pisc-sc_guidance_final_december_clean.pdf.

"Post-Injection Phase" means the time between the date of injection completion and 100 years after injection completion.[21]

"Post-Injection Site Care" means appropriate monitoring and other actions (including corrective action) needed following the completion of injection to ensure permanence of sequestered carbon dioxide.[22]

"Post-Injection Site Care and Monitoring Period" means the time between the date of injection completion and 100 years after injection completion.

"Pressure Front" means the zone of elevated pressure that is created by the injection of carbon dioxide into the subsurface. For the purpose of this article, the pressure front of a carbon dioxide plume refers to a zone where there is a pressure differential sufficient to cause the movement of injected fluids or formation fluids into a USDW.[23]

"Program" means the Carbon Capture, Removal, Utilization, and Storage Program established pursuant to Section 39741.1.*

"Saline Aquifer Reservoir or Saline Reservoir" see storage complex definition.

"Seismicity" refers to the geographic and historical distribution of earthquakes.[24]

"Seismic Risk" is a function of three elements: (1) the seismic hazard or likelihood of occurrence of an earthquake and the associated severity of shaking, (2) the seismic vulnerability or expected damage to buildings and other structures given the occurrence of an earthquake, and (3) the expected consequences or losses resulting from the predicted damage.[25]

"Sensitive Receptors" means any of the following: [26]

(1) An education facility, including a preschool, school with transitional kindergarten, kindergarten, or any of grades 1 to 12, inclusive, daycare center, park, playground, college, or university.

(2) A community resource center, including a youth center.

(3) A health care facility, including a hospital, retirement home, or nursing home.

(4) Live-in housing, including a long-term care hospital, hospice, prison, detention center, or dormitory.

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[21] See LCFS CCS Protocol supra note 4.
[22] See LCFS CCS Protocol supra note 4.
[23] EPA regulates Class VI injection wells under the UIC program via 40 CFR § 146.81
[24] See supra note 12.
[25] Federal Emergency Management Agency. (2004). Primer for design professionals: Communicating with owners and managers of new buildings on earthquake risk (FEMA 389). https://mitigation.eeri.org/files/fema389.pdf
[26] Cal. Code Regs. tit. 19, div. 1, ch. 14, art. 9, § 2170 et seq. (CO_2 Pipelines) (draft express terms, State Fire Marshal) (on file with California Office of the State Fire Marshal), available at Draft Initial Express Terms – CO_2 Pipelines.

(5) A residence, including a private home, condominium, apartment, and living quarter.

(6) A building that is a business that is open to the public.

(7) A sensitive receptor does not include a facility or building set forth in (1) through (6) that is not certified for occupancy or has been abandoned.

“Storage” means any pathway that stores captured and concentrated streams of CO_2 through trapping, mineralization, or other physical or chemical processes. Storage pathways are combined with another form of CCS or CDR that conducts the removal.

“Storage Complex” (see Regulatory Text Concept for Term and Definitions Including Area of Review and Storage Complex)

“Synthetic CDR” means any CDR pathway that uses engineered systems powered by low carbon energy to directly separate CO_2 from the air and capture it, or to alter water chemistry to indirectly remove CO_2 from the air, including CO_2 stripping, electrochemical alkalinity production, and direct air capture.

“Technology Readiness Levels” means a type of measurement system used to assess the maturity level of a particular technology.[27]

“Toxic Air Contaminants or TACs” means an air pollutant which may cause or contribute to an increase in mortality or an increase in serious illness, or which may pose a present or potential hazard to human health (Health and Safety Code Section 39655a). TACs refers to the substances which have been listed as federal hazardous air pollutants pursuant to section 7412 of Title 42 of the United States Code and substances identified as toxic air contaminants under Title 17, CCR section 93000.

[27] ”Technology Readiness Levels.” NASA, 27 Sept. 2023, https://www.nasa.gov/directorates/somd/space-communications-navigation-program/technology-readiness-levels/. Accessed 6 Mar. 2026.

Regulatory Text Concept for Section 95701 on Terms and Definitions Including Area of Review and Storage Complex

CARB staff invites the public to provide feedback regarding an appropriate definition of the area of review and seeks input on whether CARB should adopt the U.S Environmental Protection Agency (EPA) Underground Injection Control Program (UIC) definitions, the Low Carbon Fuel Standard (LCFS) Carbon Capture and Sequestration (CCS) Protocol definitions, or develop a hybrid approach that incorporates all elements. To inform regulation drafting, CARB staff are reviewing existing definitions for the area of review as it pertains to geologic storage projects under the SB 905 regulation. CARB staff are evaluating the following definitions by the EPA UIC program and CARB's LCFS CCS Protocol:

EPA UIC Program (All well classes)

Area of review means the area surrounding an injection well described according to the criteria set forth in 40 CFR § 146.06 or in the case of an area permit, the project area plus a circumscribing area the width of which is either 1⁄4 of a mile or a number calculated according to the criteria set forth in § 146.06.

EPA UIC Class VI Program

Area of review means the region surrounding the geologic sequestration project where USDWs may be endangered by the injection activity. The area of review is delineated using computational modeling that accounts for the physical and chemical properties of all phases of the injected carbon dioxide stream and displaced fluids, and is based on available site characterization, monitoring, and operational data as set forth in 40 C.F.R. s. 146.84.

LCFS CCS Protocol

Storage complex means the three-dimensional subsurface volume that is characterized, modified by corrective actions, and monitored so that the CCS Project is able to meet the requirements for carbon sequestration under the Permanence Requirements (section C). For saline and depleted oil and gas reservoirs, the storage complex includes the injection zone (in which the CO_2 is emplaced), a sequestration volume, which is expected to contain the CO_2, and overlying and possibly underlying geologic formations that are required to provide assurance of storage. The storage complex must include a multilayered confining system that retards vertical migration of CO_2. The storage complex must extend laterally over (1) the volume from which CO_2 (as a free or dissolved phase) could escape from storage in the subsurface if a permeable pathway exists, and (2) the area over which the plume may migrate.

(b) For the purposes of this framework, the following acronyms apply:

“AB 1279” means Assembly Bill 1279, the California Climate Crisis Act.

“AB 1757” means Assembly Bill 1757, the California Global Warming Solutions Act of 2006: Climate Goal: Natural and Working Lands.

“AoR” means area of review.

“BECCS” means bioenergy with carbon capture and storage.

“CARB” means California Air Resources Board.

“CAP” means criteria air pollutants.

“CCS” means carbon capture and storage.

“CCSUPA” means Carbon Capture and Storage Unified Permit Application.

“CCUS” means carbon capture, utilization, and storage.

“CDR” means carbon dioxide removal.

“CEQA” means California Environmental Quality Act.

“CFR” means Code of Federal Regulations.

“CGS” means California Geological Survey

“CISN” means California Integrated Seismic Network.

“CNRA” is the California Natural Resources Agency.

“CO_2” means carbon dioxide.

“EPA” means the U.S Environmental Protection Agency.

“ERRP” means emergency and remedial response plan.

“GHG” means greenhouse gas.

“HSC” means California Health and Safety Code.

“IPCC” means Intergovernmental Panel on Climate Change.

“LCFS” means Low Carbon Fuel Standard.

“MOU” means memoranda of understanding.

“MRR” means the California Air Resources Board's Regulation for the Mandatory Reporting of Greenhouse Gas Emissions.

“NPDES” means National Pollutant Discharge Elimination System.

“NSR” means new source review permit.

“PISC” means post-injection site care.

“PRC” means California Public Resources Code.

“SB 905” means Senate Bill 905, Carbon Capture, Removal, Utilization, and Storage Program.

“TAC” means toxic air pollutants.

“TLS” means traffic light system.

“UIC” means Underground Injection Control program.

“USDW” means underground storage drinking water.

“WDR” means waste discharge requirements.

§ 95702. Applicability.

The purpose of this section is to establish entity applicability for the Carbon Capture, Removal, Utilization, and Storage Program.

(a) CARB is considering including regulatory requirements for the following types of entities performing carbon capture, utilization, and storage (CCUS) and carbon dioxide removal (CDR):

(1) Carbon capture from large emissions sources with permanent geologic storage or storage through utilization pathways;

(2) Direct air capture with permanent geologic storage or storage through utilization pathways;

(3) Bioenergy with carbon capture and storage (BECCS);

(4) Depleted oil and gas reservoir storage;

(5) Saline aquifer reservoir storage; and

(6) Mafic and ultramafic reservoir storage.

(b) Under California Public Resource Code § 3132(b) (added by section 4 of SB 905), injecting carbon dioxide into Class II wells for enhanced oil recovery is prohibited, except for projects that began operating prior to January 1, 2022.

Regulatory Text Concept for Section 95702 on Applicability

CARB staff invites the public to provide feedback on CCUS and CDR project types not identified in this preliminary concept document that may be appropriate for inclusion in the applicability section.

CARB staff has initially focused on mechanical carbon removal approaches, specifically CCUS and CDR technologies defined in Health and Safety Code section 39741 that demonstrate high technological readiness and near-term deployment potential in California. This initial focus does not include nature-based strategies that rely solely on natural carbon sequestration or storage. CARB recognizes nature-based climate solutions are essential to achieving California's carbon-neutrality objectives and continues supporting them under Assembly Bill 1757 (Garcia, Chapter 341, Statutes of 2022).

§ 95703. General Project Reporting of CCUS and CDR Technologies.

The purpose of this section is to describe the general reporting requirements for the project types defined in section 95702. Carbon capture systems and carbon geologic storage projects in California are subject to various permitting programs that protect California's air and water resources. As these permits already include monitoring and reporting obligations, this section focuses on facilitating public access to permit and project information. CARB staff are considering the following project reporting requirements:

(a) Project operators would need to create an online public-facing landing page, referred to as the project data information listing, that hosts all required monitoring plans and the project's current compliance status. This information will be presented in an accessible standardized format determined by CARB.

(b) Under the project data information listing, project operators would need to provide a monitoring plan that includes

  (1) Project description and the titles and identifying information for all applicable air and water permits under which the project operates.

  (2) Details of all permit monitoring obligations and the monitoring and analytical methods project operators will use to achieve those obligations.

  (3) Annual updates on the status of all permit compliance.

(c) The following plans are subject to general reporting requirements and to be hosted on the project data information listing:

(1) 95704.2. Subsurface and Ambient CO_2 Monitoring Plan and Report.

(2) 95704.3. Seismic Monitoring Requirements.

(3) 95704.4. Geologic Storage Emergency Remedial Response Plan.

Regulatory Text Concept for Section 95703 on General Project Reporting of CCUS and CDR Technologies

CARB staff invites the public to provide feedback on the proposed information to be publicly posted by project operators, or suggestion of additional information to be posted on the project operator's webpage.

CARB staff are considering requiring the following types of information be posted publicly by project operators:

Project information:

(1) Project name

(2) Operator name, and Corporate Parent if applicable

(3) Project description, including but not limited to, CO_2 sourcing (if applicable), energy sources, estimated operational timeframe, and other information

(4) Location (address or geo-coordinates) for injection and capture sites, as applicable

(5) Monitoring and other plans required by this regulation or existing permitting processes, including plans identified in the following sections:

a. 95704.2. Subsurface and Ambient CO_2 Monitoring Plan and Report.

b. 95704.3. Seismic Monitoring Requirements.

c. 95704.4. Geologic Storage Emergency Remedial Response Plan.

(6) Compliance status under applicable permits, including any Notices of Violations and the corrective actions taken

(7) If applicable, any public funding received by or awarded to the project

§ 95704. Geologic Storage.
The requirements under this section are built on the U.S. EPA's Class VI program to ensure that commercial-scale geologic storage projects are implemented safely and transparently.

For the purpose of section 95704, "geologic storage operator" and "operator" are used interchangeably.

§ 95704.1. Applicability for Geologic Storage Methods.
The purpose of this section is to define the onshore geologic storage project types that are subject to 95704.2 through 95704.7.

(a) Applicable Project Types:

(1) Depleted Oil and Gas Reservoir

(2) Saline Aquifer Reservoir

(3) Mafic and Ultra-Mafic Reservoir

Regulatory Text Concept for Section 95704.1 on Applicability for Geologic Storage Methods

CARB staff invites the public to provide feedback on whether additional non-CO_2 geologic storage methods should be included and any monitoring considerations that should be addressed.

CARB staff are evaluating whether non-CO_2 geologic storage methods, such as bio-oil, storage in building materials, and other storage mediums, should be considered for possible inclusion.

§ 95704.2. Subsurface and Ambient CO_2 Monitoring Plan and Report.[28]
The purpose of this section is to outline requirements for subsurface and ambient CO_2 monitoring at geologic storage sites.

(a) For subsurface monitoring, CARB staff are considering adopting and modifying the plume and pressure tracking requirements outlined in subsections C.4.3.2.1(a), C.4.3.2.1(c), and C.4.3.2.1(d) of the Low Carbon Fuel Standard (LCFS) Carbon Capture

[28] The Office of the State Fire Marshal (OSFM) has proposed requirements for CO_2 pipelines under CCR Title 19, Chapter 14, Article 8. These draft requirements include incorporation by reference of applicable American Petroleum Institute (API) standards for in-line inspection, reporting and notification obligations for operators, and enforcement actions for violations. OFSM 2025 Pipeline In-Line Inspection (ILI) Requirements rulemaking materials are available at the Title 19 Development webpage.

and Sequestration (CCS) Protocol into these CCUS Program regulations. This subsurface monitoring would continue for at least 100 years after injection ceases.

(1) With this approach, geologic storage operators would need to develop and submit a subsurface monitoring plan based on the CCS Protocol requirements, in accordance with section 95703, which will include:

(A) Details on the methods used to monitor and track the CO_2 plume movement within the storage complex:

1. Location

2. Thickness

3. Saturation

4. Pressure front

(B) Details related to re-evaluating the plume every five (5) years to ensure containment for 100 years post injection. Each re-evaluation would need to be retained for a minimum of 10 years following the post-injection monitoring phase and made available upon request.

(b) For ambient CO_2 monitoring, CARB staff are considering adopting and modifying requirements outlined in subsections C.4.3.2.2(a) - C.4.3.2.2(d) of the LCFS CCS Protocol into these CCUS Program regulations. This ambient CO_2 monitoring would continue for at least 50 years after injection has ceased.

(1) Under these methods, geologic storage operators would then need to prepare and provide an ambient CO_2 monitoring plan in accordance with section 95703, which include:

(A) Details on the methodologies used to monitor ambient CO_2 concentrations at locations where leakage risk may be elevated (e.g., injection wellheads, abandoned wells, known faults).

(B) Details related to evaluating and documenting ambient CO_2 monitoring data annually to verify that no leakage is occurring. Each evaluation would need to be retained for a minimum of 10 years following the post-injection monitoring phase and made available upon request.

Regulatory Text Concept for Section 95704.2 on Requirements for Subsurface and Ambient CO_2 Monitoring Plan and Report

CARB staff invites the public to provide feedback on any gaps in both the CCS Protocol and Class VI programs for CO_2 plume and pressure tracking activities, and suggestions for ambient CO_2 monitoring requirements that will best complement these existing programs.

CARB staff are considering applying the existing LCFS CCS Protocol's CO_2 plume and pressure front tracking requirements, with additional considerations, to all projects in California.

§ 95704.3. Seismic Monitoring Requirements.

The purpose of this subsection is to establish requirements for geologic storage operators to develop and implement seismic monitoring plans for baseline monitoring, operational monitoring, and the 100-year post-injection monitoring period. Under these plans, operators would need to maintain a seismic monitoring system that continuously detects and measures both natural and induced seismic activity within and adjacent to the storage complex. CARB staff are considering the following seismic monitoring requirements:

(a) For baseline seismic monitoring, geologic storage operators would need to develop a plan that is made publicly available in accordance with subsection 95703. The baseline monitoring plan should include:

(1) Details on the seismic monitoring array network that is configured based on site characterization and the properties of the storage reservoir. The array should be capable of detecting microseismicity.

(2) Details demonstrating that the baseline monitoring period will last at least one year and will cover an area with a radius at least twice that of the U.S. EPA Class VI Area of Review (AoR).

(3) A seismic risk assessment that evaluates the likelihood of seismic events that could affect critical features such as infrastructure, nearby populations, or faults.

(A) The risk assessment should further identify all plausible risk scenarios, including:

1. Damage to structures;

2. Public nuisance; and

3. Drinking water contamination.

(B) The seismic risk assessment would need to inform the monitoring thresholds and mitigation measures for the traffic light system (TLS) described in ERRP, subsection 95704.4.

(4) Process for evaluating and summarizing the results of the baseline seismic monitoring data.

(A) The baseline seismic data evaluation would need to:

1. Characterize natural background seismicity using one year of seismic monitoring data;

2. Validate the seismic array specifications;

3. Validate the seismic array's connection to the California Integrated Seismic Network (CISN); and

4. Demonstrate that the seismic monitoring system can support TLS implementation.

(B) Operators may supplement their baseline data with relevant historical information, such as regional seismic network records or prior site-specific monitoring.

(C) The results of the baseline monitoring evaluation should be documented, retained for at least 10 years after the post-injection monitoring phase, and made available upon request.

(b) For operational seismic monitoring, geologic storage operators would need to develop an operational monitoring plan that is made publicly available in accordance with subsection 95703. This plan should also inform the development and implementation of the ERRP and be made available at the start of the injection operations. The operational monitoring plan should include:

(1) Details on how operators will update the seismic monitoring design and implementation based on the results of the baseline monitoring evaluation, as described under subsection 95704.3(a)(4).

(2) Details on how operators will continuously collect and evaluate seismic and operational data, including:

(A) Evaluating seismic data to:

1. Determine seismic event locations;

2. Identify any previously unknown faults that could increase the risk of induced seismicity; and

3. Determine if the TLS threshold has been exceeded.

(B) Evaluating operational data (e.g., injection rate, injection pressure) alongside seismic data to determine whether abnormal subsurface pressure changes or seismic activity are correlated with injection operations.

(3) Process for evaluating and summarizing the results of the operational seismic monitoring data.

(A) Operators should evaluate and summarize the collected monitoring data annually and include:

1. Potential links between injection operations and seismic events;

2. Identification of any new faults or other subsurface features;

3. Any modifications to the project operations;

4. Any new well operations within a radius of at least twice that of the AoR.

(B) Operators should re-evaluate the operational seismic monitoring plan whenever key-specific elements change, such as modifications to the AoR extent, project operations, or infrastructure.

(C) Operators should document and retain the annual summaries and all re-evaluations for at least 10 years after the post-injection monitoring phase, and make these records available upon request.

(c) For post-Injection seismic monitoring, geologic storage operators would need to develop a plan that is made publicly available in accordance with subsection 95703. This plan should be made available at the start of the post-injection monitoring. The post-injection seismic monitoring plan should include:

(1) Details on how operators will update the seismic monitoring design and implementation to meet the 100 years of post-injection monitoring, with considerations of the operational monitoring evaluations, as described under subsection 95704.3(b)(3).

(2) Details on how the operators will continuously collect and evaluate seismic data to determine whether the TLS threshold has been exceeded.

(3) Process for evaluating and summarizing the results of the post-injection seismic monitoring data.

(A) Operators should annually evaluate and summarize the collected post-injection monitoring data, including the following details:

1. Potential links between CO_2 plume movement and seismic events;

2. Any new well operations within a radius of at least twice that of the AoR.

(B) Operators should re-evaluate the post-injection seismic monitoring plan whenever key-specific elements change, such as modifications to the AoR extent, project operations, or infrastructure.

(C) Operators should document and retain the annual summaries and all re-evaluations for at least 10 years after the post-injection monitoring phase and make these records available upon request.

Regulatory Text Concept for Subsection 95704.3(c) on Post-Injection Seismic Monitoring Plan

CARB staff invites the public to provide feedback on the post-injection seismic monitoring plan, the proposed requirement to demonstrate plume stabilization after ten years, and any other factors that should be considered in developing this provision.

In consultation with the California Geological Survey (CGS), CARB staff are considering allowing geologic storage operators to demonstrate CO_2 plume stabilization after ten (10) years of post-injection monitoring as a basis for reducing or retiring the project-level seismic array network. A minimum of 10 years of continued monitoring is expected to provide a reasonable timeframe to demonstrate that the CO_2 plume is stable and does not pose a risk of inducing seismic events. If approved by CARB on the basis of specified criteria in consultation with CGS as needed, project-level seismic array monitoring may be reduced. The geologic storage operator would need to continue to maintain its connection with the California Integrated Seismic Network and continue preparing annual summaries of seismic monitoring data and incidental reports to ensure ongoing safety and regulatory compliance.

§ 95704.4. Geologic Storage Emergency Remedial Response Plan.

The purpose of this subsection is to establish requirements for geologic storage operators to develop and implement an emergency remedial response plan (ERRP) that complements the existing Class VI ERRP regulations.[29] The ERRP should outline any potential impact from seismic activity and CO_2 leakage, and describe remediation actions operators should take to protect local resources and sensitive receptors. Operators would need to provide this plan in accordance with subsection 95703 prior to injection operations. The ERRP should include:

(a) For seismic risk, a traffic light system (TLS) to manage seismicity and related risks until the end of the post-injection monitoring phase.

(1) The TLS would need to include at least three (3) threshold levels:

(A) Green for normal operating conditions;

(B) Yellow for elevated conditions; and

(C) Red for response or emergency conditions.

(2) These thresholds should be informed by the seismic risk assessment and based on earthquake magnitudes, with each level corresponding to specific monitoring, operational, and notification actions.

(3) At minimum, operators should implement the ERRP in the case of the following two incidents:

(A) Seismic event of magnitude 2.0 or greater; or

(B) Triggers TLS Yellow threshold or higher.

(b) For CO_2 leakage risk, detailed procedures and remedial actions for responding to confirmed or suspected CO_2 release from the designated reservoir to ensure prompt containment. Operators should take all steps reasonably necessary to identify, characterize, and quantify CO_2 leakage.

(c) Details for notifying and reporting in the event the ERRP is triggered. Following the completion of any necessary remedial actions, operators would need to submit a final report detailing the root cause(s) and the action taken in accordance with ERRP.

[29] 40 CFR 146.94

Regulatory Text Concept for Section 95704.4 on Geologic Storage Emergency Remedial Response Plan

CARB staff invites the public to provide feedback on additional seismic and CO_2 leakage analysis or mitigation measures that should be considered for inclusion in the ERRP beyond U.S. EPA Class VI requirements. CARB specifically requests feedback on supplemental approaches that could strengthen prevention, detection, and response to potential CO_2 leakage during construction, operational and post injection phases.

CARB staff are reviewing emergency and remedial response requirements under EPA's UIC program that address potential endangerment to underground storage drinking water (USDW) from injected carbon dioxide and the associated pressure front. CARB staff are considering proposing additional requirements specifically focused on seismic activity response and CO_2 leakage scenarios from geologic storage sites to ensure CO_2 containment and protection of nearby populations, infrastructure, and other sensitive receptors.

§ 95704.5. Operational Changes.

Regulatory Text Concept for Section 95704.5 on Considerations for Operational Changes under the CCUS Program

CARB staff invites the public to provide feedback on potential triggers and associated actions needed to ensure public health and safety when monitoring indicates increased seismicity, CO_2 leakage outside the geologic storage reservoir, or other events related to CO_2 injection that occur that trigger the Emergency Remedial Response Plan.

CARB staff are developing regulatory concepts for section 95704.7 to align with Public Resources Code section 71463, which authorizes the state board, in consultation with the State Geologist, to require operational changes, including mandatory pauses, when monitoring or reporting identifies these risks.

§ 95704.6. Financial Responsibility for Geologic Storage Projects.

The purpose of this subsection is to establish long-term financial responsibility requirements for geologic storage operators. The requirements outlined in this subsection align with U.S. EPA's financial responsibility requirements for Class VI wells (see 40 CFR 146.85) and expand upon them to carry out the direction of Health and Safety Code section 39741.5.

(a) Operators applying for Permanence Certification under CARB's Low Carbon Fuel Standard (LCFS) Program must meet the financial responsibility requirements defined in section C.7 of the CCS protocol.

(b) All other applicable geologic storage projects identified in subsection 95704.1 that are not applying for Permanence Certification would instead need to meet the following financial responsibility requirements:

(1) Qualifying Instruments for Financial Responsibility

(A) Geologic storage operators would need to demonstrate financial responsibility using one or more of the qualifying financial instruments listed below:

1. Trust Funds;

2. Surety Bonds;

3. Letter of Credit;

4. Insurance;

5. Self-Insurance (i.e., Financial Test and Corporate Guarantee);

6. Escrow Account; or

7. Other instrument(s) determined to meet regulatory requirements.

(B) In the event that a geologic storage operator uses more than one instrument for a specific phase of project activities (e.g., emergency and remedial response, well plugging and abandonment, corrective action, and post injection site care and closure), the combination would need to be limited to instruments that are not based on financial strength or performance.

(C) All instrument-specific conditions would align with those defined in 40 CFR 146.85(a)(6)(i-vii).

Regulatory Text Concept for Subsection 95704.6(a) on Qualifying Instruments for Financial Responsibility

CARB staff invites the public to provide feedback on whether geologic storage operators should be required to engage an independent assurance provider to verify project financials and compliance with long-term financial responsibility requirements, as well as which accredited third-party providers have the appropriate expertise. CARB also welcomes input on any additional qualifying financial instruments that should be added to subsection 95704.6(a).

CARB staff are evaluating verification mechanisms to ensure operators meet long-term financial responsibility obligations using approved financial instruments.

(2) Coverage Scope

(A) Geologic storage operators would need to show that their qualifying instrument(s), as identified in 95704.6(b)(1), are sufficient to cover the costs of:

1. Corrective action that meets the requirements of 40 CFR 146.84;

2. Injection well plugging that meets the requirements of 40 CFR 146.92;

3. Post injection site care and site closure that meets the requirements of 40 CFR 146.93 adjusted to meet the required seismic monitoring in subsection 95704.3(c) and the required 100 years post-injection monitoring period; and

4. Emergency and remedial response that meets the requirements of 40 CFR 146.94, adjusted to include the costs associated with the requirements described in subsection 95704.4;

Regulatory Text Concept for Subsection 95704.6(b)(2) on Financial Coverage Scope

CARB staff invites the public to provide feedback on whether the following additional activities should be included in the financial responsibility demonstration. CARB staff are also seeking public input on how these additional requirements may affect operators financially and operationally:

(1) Extending the required Class VI post-injection monitoring period from 50 to 100 years;

(2) Conducting additional ambient CO_2 and seismic monitoring to meet the requirements in section 95704.2 and 95704.3 respectively; and

(3) Ensuring emergency and remedial response covers additional seismic events as defined in subsection 95704.4

CARB staff are evaluating these activities to comply with CARB's CCUS Program regulations, which expands financial responsibility requirements beyond U.S. EPA's Class VI well program.

(3) Maintenance Period

(A) Geologic storage operators would need to maintain financial responsibility for applicable activities and associated resources for a period of no less than 100 years after the last date of injection.

(B) For release from the responsibility of maintaining a financial instrument for a given CCS phase, that phase would need to be completed, and all its financial obligations fulfilled.

(4) Protective Conditions of Coverage

(A) Qualifying financial responsibility instruments would need to comprise protective conditions of coverage specified under 40 CFR 146.85(a)(4), including cancellation, renewal, continuation, specifications on provider liability, and provider qualifications for meeting minimum rating, capitalization, and ability to pass the bond rating, as applicable.

(B) Cancellation, renewal and continuation of policies covering activities including emergency and remedial response, plugging and abandonment, corrective action, and post injection site care and closure would need to follow requirements set in 40 CFR 146.85(a)(4)(i)(A-C). Cancellation

would need to be reported to CARB in a manner following that described in 40 CFR 146.85(a)(4)(i)(A).

(5) Cost Estimates and Adjustments

(A) Geologic storage operators would need to submit and update cost estimates for financial responsibility coverage to CARB for review or to another third-party assurance provider. Requirements under this section would align with requirements under 40 CFR 146.85(c).

(B) Updated costs estimates would need to include detailed written estimates (in current dollars) of the following activities and project phases:

1. Corrective action on all wells that either penetrate the storage complex or are within the surface projection of the storage complex;

2. Plugging the well(s);

3. Post-injection site care and site closure; and

4. Emergency and remedial response.

(C) Operators would need to inform CARB within 60 days of any adjustments made to cost estimates following amendments to any of the following required plans:

1. Corrective Action Plan

2. Well Plugging and Abandonment Plan

3. Post-Injection Site Care and Site Closure Plan

4. Emergency and Remedial Response Plan

(D) If a cost estimate increases, an operator would need to submit additional compliant financial responsibility instrument(s) to cover the increased cost.

(E) If CARB determines the most recent demonstration of the qualifying financial responsibility instrument(s) is no longer adequate to cover the cost of Corrective Action, Well Plugging and Abandonment, Post Injection Site Care and Closure, and Emergency and Remedial Response, operators would need to provide CARB a written cost estimate adjustment within 60 days of notification.

(6) Notification of Adverse Financial Conditions.

(A) Geologic storage operators would need to notify CARB of adverse financial conditions, including but not limited to bankruptcy, that may affect the ability to carry out injection, well plugging, emergency and remedial response, corrective actions, post-injection site care and site closure.

(B) In the event of the operator or third-party provider of a financial instrument going through bankruptcy proceedings, they would need to notify CARB in a manner matching the notification requirements of 40 CFR 146.85(d).

§ 95704.7. Legal Instruments for Proof of Agreement.

The purpose of this subsection is to outline requirements for geologic storage operators to submit to CARB a legally binding agreement among all relevant parties. Under Public Resources Code section 71461, California Natural Resources Agency (CNRA) is directed by the Legislature to publish a framework governing agreements among two or more tracts of land overlying the same geologic storage reservoir or reservoirs, including the binding agreement that prohibits drilling or extraction activities for at least 100 years after injection. Consistent with that statute, CARB is considering the following;

(a) Geologic Operators would need to submit proof of a legally binding agreement among all relevant parties that would ensure:

(1) No drilling or extraction activities would penetrate the geologic reservoir for at least 100 years after the last date of carbon dioxide injection.

(2) Alignment with any other appropriate outcomes from the development of Public Resources Code section 71461 framework process.

(b) For geologic storage projects located in California and voluntarily seeking Permanence Certification under the LCFS CCS Protocol, CARB is considering exempting projects meeting the requirements described in this section from the CCS Protocol requirements under section C.9, Legal Understanding, Contracts, and Post-Closure Care. Projects located outside of California applying for Permanence Certification under the CCS Protocol would not be eligible for this exemption.

§ 95705. Carbon Capture and Storage Unified Permit Application.

The purpose of this section is to describe potential use cases, outline requirements, and define agency roles and responsibilities for the Carbon Capture and Storage Unified Permit Application (CCSUPA).

(a) The CCSUPA may be used on a voluntary basis by project operators of project types defined in subsection 95702. The CCSUPA will support project operators with improve knowledge of permitting documentation requirements and processes by promoting interagency collaboration between permitting authorities.

Regulatory Text Concept for Section 95705 on the Carbon Capture and Storage Unified Permit Application

CARB staff invites the public to provide feedback on what information should be included in guidance documents to best clarify and expedite the permitting process for CCUS and CDR projects. CARB has already received public input on common permitting application requirements for inclusion in the CCSUPA.

CARB staff are designing the CCSUPA, along with related guidance materials and an internet-based tool, to improve efficiency for project developers and permitting authorities by centralizing permitting information, enhancing interagency coordination, and supporting proactive applicant planning.

§ 95706. Carbon Capture, Removal, Utilization and Storage Protocols.

The purpose of this section is to incorporate and/or advance the adoption of protocols to support additional methods of carbon dioxide capture, removal, utilization, or storage.

Regulatory Text Concept for section 95706 on Carbon Capture, Removal, Utilization and Storage Protocols

CARB staff invites the public to provide feedback on additional pathways and technologies that should be considered for protocol development, as well as on key elements that should be included in such protocols, such as permanence, monitoring, reporting, verification, and quantification, to ensure effective integration with existing regulatory structures.

CARB staff are developing regulatory text concepts to align with Health and Safety Code section 39741.4, which directs CARB to consider the adoption of protocols to support additional methods of carbon dioxide utilization or storage. Such additional methods include carbon capture for use in products and in methods identified by CARB.

CARB staff are evaluating CCUS and CDR pathways and technologies that could be supported by the adoption of such protocols. Technologies under evaluation include:

(1) Project types identified in section 95702

(2) Marine carbon dioxide removal (e.g. coastal enhanced weathering, electrodialysis)

(3) Carbon mineralization or carbonate looping (e.g. terrestrial enhanced weathering, surficial mineralization)

(4) Biomass or bio-oil storage (e.g., pyrolysis to biochar, pyrolysis to bio-oil)

(5) Carbon utilization projects (e.g., cement, bio char, durable wood products)

(6) Other biogenic nature-based climate solutions