October 6, 2025

The Honorable Dr. Steven Cliff
Executive Officer
California Air Resources Board
1001 I Street
Sacramento, CA 95814

Re: Information Solicitation to Inform Implementation of Carbon Capture, Removal, Utilization, and Storage Program: Senate Bill 905

Dear Dr. Cliff:

Thank you for the opportunity to provide comments on the California Air Resources Board's (CARB) solicitation regarding implementation of Senate Bill 905 (Caballero, 2022) and the ongoing efforts to develop a successful Carbon Capture, Removal, Utilization, and Storage (CCRUS) Program.

As a California-based company pioneering carbon capture, utilization and storage (CCUS) via mineralization technology, Blue Planet strongly supports CARB's efforts to develop a robust CCRUS Program pursuant to SB 905 that will deliver scalable, permanent carbon capture and removal solutions. Moreover, we commend CARB for advancing a framework that will accelerate progress towards the 2022 Scoping Plan's goal to deploy 20 million metric tons CO_2-equivalent per year ($MMTCO_2e$/year) of CCRUS by 2030 and 100 $MMTCO_2e$/year by 2045. Carbon mineralization and storage/utilization in concrete aggregates offers one of the most significant carbon storage opportunities for California, while creating a value-added product that can support carbon management at scale.

We respectfully recommend CARB ensure that implementation of SB 905 does not focus exclusively on geologic sequestration of concentrated CO_2 streams, but rather encourages all forms of durable carbon storage and transport of CO_2 for utilization and storage. Specifically, we urge CARB to explicitly recognize the fundamental distinction between geologic sequestration of concentrated CO_2 streams and carbon mineralization pathways such as Blue Planet's technology, as well as other methods of moving CO_2 besides dedicated CO_2 pipelines. Unlike geologic storage, mineralization converts CO_2 into solid carbon minerals, rendering it chemically stable and eliminating the risk of leakage or future release. Blue Planet also moves CO_2 as a diffuse bicarbonate solution in water, avoiding the concerns associated with concentrated CO_2

pipelines. As outlined in our prior comments to CARB,[1] mineralization provides permanent storage with no risk of reversal, while also delivering co-benefits such as the capture of criteria pollutants, including NO_x, SO_x, and particulates.

Equitable treatment of mineralization and geologic sequestration will accelerate innovation and provide California with a broader portfolio of carbon management tools. Simultaneously, ensuring that statutory and regulatory definitions align with these scientific distinctions will both reduce unnecessary compliance burdens and accelerate deployment of the full range of carbon management solutions contemplated under SB 905.

About Blue Planet

Blue Planet is a California-based company pioneering technology and products for economically sustainable carbon management by converting captured CO_2 into high-value building materials. Our carbon mineralization process can be deployed across a wide array of difficult-to-decarbonize industries – including power plants, refineries, cement production and others – and in connection with direct air capture (DAC) projects, biomass facilities, or other carbon dioxide removal (CDR) strategies. Importantly, our technology captures not only CO_2, but also particulate matter, NO_x, SO_x and other pollutants hazardous to surrounding communities. We currently have operations at a plant in Pittsburg, California on the Sacramento Delta, and our carbon-sequestered aggregate has been utilized at San Francisco International Airport, where carbon-sequestered concrete is specified.

Blue Planet's technology produces coarse and fine limestone aggregate made from sequestered CO_2 utilizing the carbon mineralization process. It allows lower-cost carbon capture, including from direct air capture or other carbon removal pathways, by avoiding the need to purify and enrich captured CO_2 before use, reducing the cost and energy needs associated with carbon capture. It also can be deployed at scale anywhere; sources of captured or removed CO_2 do not need to be proximate to a CO_2 pipeline or geologic sequestration site to successfully manage carbon.

Carbon Mineralization and Utilization/Storage in Concrete, Negative Emissions, and Market Alignment

Carbon capture, mineralization, and utilization as aggregate in concrete offers tremendous potential not only to eliminate CO_2 emissions from point sources or advance CDR, but also to permanently sequester CO_2 as a value-added product that strengthens the economics of CCRUS strategies. Recent research from UC Davis and Stanford, published in *Science*,[2] found that replacing conventional building materials with carbon storing alternatives could sequester about 17 billion tons of CO_2 per year, *or roughly half of current global CO_2 emissions*. The researchers found that carbon storage in aggregates represents the single largest opportunity within the built environment. By embedding mineralized CO_2 in aggregates, Blue Planet's technology enables the production of carbon negative concrete mixes, moving beyond incremental reductions

[1] https://ww2.arb.ca.gov/system/files/webform/public_comments/22051/Blue%20Planet_SB%20905%202.27.25%20workshop%20comments.pdf
[2] https://www.science.org/doi/10.1126/science.adq8594

offered through other strategies to achieve net negative outcomes at the mix level. This positions mineralization as a negative emissions solution that actively reduces CO_2 and displaces carbon-intensive materials.

Storing carbon in concrete will advance the state's goals to reduce embodied carbon and can leverage the built environment to advance California's carbon neutrality goals. These technologies create a pathway to dramatically reduce emissions from hard-to-abate sectors and scale CDR. However, bringing these solutions to market and scaling them requires significant private-sector investment, which depends on CARB and other state agencies putting in place durable policies and frameworks to deploy projects – including committed offtake agreements, advance market commitments, clear protocols, strong market signals, and streamlined regulatory pathways to support their adoption.

While geological sequestration is a well-known approach, it requires access to underground storage sites, which are not always geographically available or economically feasible for many industrial emitters. Carbon mineralization provides a decentralized solution that can be implemented statewide without reliance on specific geologic formations. Other emerging CDR pathways, including DAC with utilization, biochar, and ocean-based carbon removal, also require regulatory clarity to scale.

Key Recommendations

Below, we offer high level feedback to guide CCRUS market development in California and respond to the questions posed in the solicitation to inform implementation for CCRUS. We look forward to continuing to work with CARB and stakeholders through the SB 905 process to refine these proposals and create a strong framework to advance the objectives of the Scoping Plan and SB 905.

Definitions, Applicability, and Project Categories

SB 905 and related statutory provisions contain definitions primarily tailored to geologic sequestration of CO_2, such as 'carbon capture and storage' defined in reference to subsurface injection. These definitions risk excluding or marginalizing pathways like carbon mineralization that achieve equivalent or superior permanence through different mechanisms.

In response to Question #1, we recommend that CARB adopt broader terms such as 'Durable Carbon Storage,' which would encompass carbon mineralization and other pathways that achieve permanent removal without the threat of leakage or carbon release. Within this framework, we propose the following definitions:

> **Durable Carbon Storage:** Methods of carbon storage that are not subject to potential reversal or leakage. Durable carbon storage includes carbon mineralization {and other pathways determined by CARB} and is not subject to ongoing emissions monitoring or financial responsibility requirements associated with geologic sequestration.
>
> **Carbon Mineralization**: An engineered process that uses captured carbon dioxide and

waste materials to form solid carbon minerals. Carbon mineralization is a form of durable carbon storage that permanently sequesters the carbon dioxide in a stable mineral form.

Carbon-Sequestered Aggregate: A form of carbon mineralization whereby captured carbon dioxide is utilized to produce synthetic limestone aggregate, which is an element of concrete. Carbon-sequestered aggregates permanently store captured carbon dioxide in mineral phase.

With respect to applicability and project categories, in response to Question #3, we first recommend that CARB consider explicitly recognizing projects that utilize captured carbon as a distinct category. The current list appropriately includes sequestration pathways, including mineralization, geologic storage, and biological systems, but does not fully address projects where captured CO_2 is used as a feedstock to displace carbon-intensive materials or processes.

While utilization alone may not always result in permanent storage, it can provide meaningful lifecycle emission reductions, create market demand for capture technologies, and accelerate deployment by improving project economics. We recognize that this may extend beyond the immediate statutory focus on permanent sequestration, but raising utilization as a complementary category would help ensure CARB's framework supports the full carbon management value chain. At a minimum, CARB could signal interest in tracking and quantifying these pathways for future program development, so that early-stage utilization projects receive recognition and do not fall outside the state's broader carbon neutrality framework.

Second, in response to Question #4, Blue Planet suggests that CARB refine its descriptions of project categories to better reflect how carbon removal occurs in practice. Concrete naturally absorbs and mineralizes ambient CO_2 over decades through the process of carbonation, and when paired with engineered pathways such as carbon aggregate, this uptake can represent a meaningful, durable removal pathway. Grouping this under the "passive air capture" category would both clarify the role of built-environment sinks and provide an important incentive for low-carbon building materials. The additional grouping of "passive air capture" would clarify the role of built-environment sinks and provide an important incentive for low-carbon or negative-emissions building materials.

Financial Responsibility, Monitoring & Reporting

Questions 5 through 14 focus specifically on the financial responsibility and monitoring provisions in SB 905, which were designed with geologic injection projects in mind. These are largely modeled on the federal Class VI well regulations under 40 CFR 146.85. Those requirements address the unique risks associated with subsurface injection of concentrated or supercritical CO_2, including the potential for leakage, migration, or long-term containment failure.

By contrast, carbon mineralization presents none of these risks. The captured CO_2 is permanently converted into solid carbon minerals that are chemically stable under ambient conditions. Indeed, reversing the mineralization process requires the same high-heat calcination process used to manufacture cement in the first place, making re-release in the natural environment impossible.

Given that mineralization projects are distinct from geologic sequestration, we recommend that CARB exempt these projects from the monitoring and financial responsibility requirements. Establishing a category of "durable carbon storage," inclusive of mineralization and other no-leakage pathways, would provide clarity that these projects are exempt from long-term liability requirements.

By aligning financial responsibility and monitoring requirements with the actual characteristics of mineralization projects, CARB can ensure appropriate oversight where it is warranted, while avoiding unnecessary burdens that would slow deployment of technologies that offer permanent carbon storage and meaningful co-pollutant reductions.

Minimizing Local Water & Air Quality Impacts, Climate-Smart Agriculture

Blue Planet Systems' mineralization process occurs in a closed system, having no impact on local water quality. All water is kept separate, recycled, and reused through reverse osmosis within the plant, which avoids chemical leaching risks that can arise in other open-environment CCUS approaches. This is in contrast to other approaches, such as enhanced weathering, where residues are spread on land and can interact with groundwater, causing the potential for leaching. Blue Planet's mineralization occurs in a closed system, avoiding chemical leaching risks that can arise in some open-environment approaches. The process water is recycled on-site via reverse osmosis, eliminating discharges to surface or groundwater. As such, these features align directly with SB 905's mandate to minimize local water and air pollution.

Integration with Existing Programs

CARB should incorporate CCUS strategies and protocols into as many programs as possible, including regulatory and compliance programs, as well as voluntary ones. This will help accelerate deployment and maximize progress towards the state's climate goals. Projects developed under SB 905 can support compliance and reporting across multiple initiatives, and CARB should incorporate protocols and rules related into CCRUS into a wide array of programs, including: Cap-and-Invest, the Low Carbon Fuel Standard (LCFS), corporate climate disclosure rules pursuant to SB 253 and SB 261, SB 27 California Carbon Sequestration and Climate Resiliency Project Registry, Mandatory Reporting Regulation, CEQA Guidelines, embodied carbon framework, public procurement and building standards, incentive programs, and others. Proactively aligning CCRUS protocols across these programs and signaling near-term rulemaking where appropriate will provide the clarity and market confidence needed to scale durable CDR and achieve the state's goals.

Advanced Market Commitments

As stated in our April 21, 2025, comment letter related to CARB's Draft Net-Zero Greenhouse Gas Emissions Strategy for the California Cement Sector Pursuant to SB 596,[3] public procurement and advanced market commitments (AMCs) are critical to scaling durable carbon

[3]https://ww2.arb.ca.gov/system/files/webform/public_comments/23416/Blue%20Planet_SB%20596%20Report%20Comments.pdf

storage technologies.[4] California agencies, especially Caltrans, are the largest user of concrete in the state. They drive markets for cement and concrete, and their choice whether or not to use low- or negative-carbon building materials will drive decisions and timelines by cement facilities and emerging low carbon cement and concrete providers.

Embedding mineralization within procurement frameworks can accelerate market adoption, reduce costs, and establish California as a global leader in low-carbon and negative-carbon construction. By leveraging state infrastructure investments, CARB and other state agencies can provide the market certainty needed to unlock private capital for early deployment of this technology and accelerate the transition of mineralization and storage/utilization from pilots to market-scale solutions.

Last, in our prior comments from April 11, 2025 on CARB's Kick-off Workshop on Building Embodied Carbon,[5] we emphasized the importance of recognizing that building materials can serve as both sources and sinks of carbon and urged CARB to classify carbon-sequestered aggregates as a distinct material category. We also recommended that embodied carbon accounting include both embodied carbon emissions and embodied carbon storage, and that CARB allow the use of the CarbonStar standard, developed by CSA/ANSI, as an alternative to environmental product declarations. CarbonStar uses a point-based system that awards credits for lowering embodied carbon compared to baseline, rewarding mixes that lower emissions or store carbon permanently, recognizing the benefits associated with negative emissions or storing carbon permanently. Referencing CarbonStar within CARB's framework would signal alignment with an established industry standard, provide market confidence in verification, and validate protocols for carbon-negative concrete.

Conclusion

We thank CARB for its thoughtful work in implementing SB 905 and advancing durable CCRUS strategies. Blue Planet is in strong support of these efforts and respectfully requests that CARB recognize mineralization in aggregates as a distinct, durable, negative-emission pathway in the implementation. We look forward to working with CARB, other industry partners, and stakeholders to bring this policy to life.

Sincerely,

Kevin Davis
Vice President of Market Development
Blue Planet Systems

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[4] For example, see page 96 of SB 596 Draft Net-Zero Greenhouse Gas Emissions Strategy for the California Cement Sector Report, which notes, "If used for concrete, an AMC can send a signal that there will be a market for low-carbon alternatives rather than conventional limestone-based cement." (https://ww2.arb.ca.gov/sites/default/files/2025-03/Draft%20Net-Zero%20GHG%20Emissions%20Strategy%20for%20the%20Cement%20Sector.pdf)

[5] https://ww2.arb.ca.gov/system/files/webform/public_comments/23186/Blue%20Planet_Embodied%20Carbon%20Workshop%20Comments.pdf