Frontier

# Cella Mineral Storage

## Carbon Dioxide Removal Purchase Application

**Fall 2022**

# General Application - Prepurchase

**(The General Application applies to everyone; all applicants should complete this)**

Company or organization name

Cella Mineral Storage

Company or organization location (we welcome applicants from anywhere in the world)

Nairobi, Kenya and New York, New York, USA.

Name(s) of primary point(s) of contact for this application

Claire Nelson, Corey Pattison

Brief company or organization description

Cella is a carbon mineralization company that aims to develop carbon storage in volcanic rocks and advance this technology to climate-change-mitigating scales.

## 1. Project Overview[1]

a. Describe how the proposed technology removes $CO_2$ from the atmosphere, including as many details as possible. Discuss location(s) and scale. Please include figures and system schematics. Tell us why your system is best-in-class, and how you're differentiated from any other organization working on a similar technology.

**Background:**

Carbon storage in basalt offers secure, long-term CO2 storage due to the potential for mineralization. This method involves in-situ injections of carbon into basaltic formations, where carbon is sequestered in an aqueous phase through dissolution and subsequently in mineral form through geochemical

[1] We use "project" throughout this template, but note that term is not intended to denote a single facility. The "project" being proposed to Frontier could include multiple facilities/locations or potentially all the CDR activities of your company.

reactions (Oelkers et al., 2008, Gislason and Oelkers, 2014). This process simply accelerates nature's long-term carbon cycle, where dissolved carbon (e.g., carbonic acid) chemically weathers silicate minerals hosted in volcanic rocks. The chemical weathering of silicate minerals releases metal cations (e.g., Ca2+) and produces alkalinity (e.g., CO32-), and these constituents combine and precipitate as carbonate minerals (e.g., CaCO3). Carbon is most thermodynamically stable in its solid mineral form; thus, mineralization offers various advantages compared to traditional carbon storage in saline formations, including increased security and permanence. Basalt is a porous and reactive rock that comprises silicate minerals that are rich in the divalent metal cations (like Ca2+) needed for carbonate mineral formation. Engineered mineralization of carbon in basalt has been proven to be a safe and permanent storage option for carbon dioxide in two basaltic settings: the CarbFix sites in Iceland (Snæbjörnsdóttir et al., 2020 and references therein) and the Wallula Basalt Pilot Project in Washington, USA (McGrail et al., 2017). These successful field demonstrations of carbon storage in basalt warrant the rapid deployment and scale-up of this carbon storage technology wherever possible.

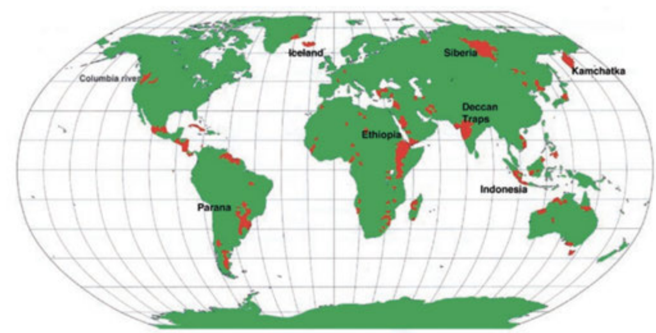


Figure 1. Global distribution of exposed basalt formations (red), from Oelkers et al., 2008.

Nevertheless, key questions remain regarding the efficiency of mineral storage at scale, and new methods are required to minimize fresh water demand and optimize high-quality verification strategies for commercial projects. Our goal at Cella is to advance this durable carbon storage technology through rapid deployment in Kenyan basalts. Situated on the East African Rift, where tectonic activity has led to extensive volcanism, our debut location in Kenya has large reservoirs of suitable basaltic rocks (Figure 1).

**Our project location:**

The favorable geology and its large and growing geothermal energy industry uniquely position Kenya to be a global carbon removal hub. Kenya is already emerging as a global leader in climate change resiliency, with ~92% of the country's energy grid supplied by renewable sources, including geothermal, hydropower, wind, and solar (EPRA Keyna, 2021), and this is projected to reach 100% by 2030. Geothermal energy accounts for nearly half of the total power generation, with a current installed capacity of ~ 863 MW. Planned development projects will double this by 2027. Beyond energy generation capacity, these assets also provide benefits for carbon storage in terms of deployment speed and climate impact. Firstly, the country's existing regulatory framework surrounding subsurface engineering, built around the world's 8th largest geothermal industry, already allows for injections of fluids into the subsurface, so our near-term method of mixing carbon dioxide with the geothermal brine waste is immediately implementable. Thus, Cella can rapidly bring mineralization storage capacity online, addressing a critical bottleneck for durable, non-EOR CO2 storage options to match the pace of proliferating DAC technologies. Secondly, the fact that Kenya's energy mix is already powered by ~92% renewable sources indicates that the renewable energy required by our CO2 capture partners (DAC companies) is not otherwise needed to displace fossil fuel dependency, as it is in the majority of other contexts. This makes Kenya the ideal location to develop large-scale commercial CDR projects. In fact, with significant growth in the capacity of its geothermal sector in recent years, DAC + mineralization can play a key role in Kenya by tapping into surplus capacity. It is estimated that 1.6 GWhr of renewable energy is curtailed daily due to inconsistent large scale energy demands; thus, DAC + mineralization can anchor demand to help realize exploitation of the ~9,000 MW of untapped geothermal potential (Geothermal Development Company, 2022), as well as alleviate issues of energy access. Based on the excess (not interfering with the country's needs) geothermal energy potential alone, Kenya could host ~20 Megaton-per-year scale carbon removal and storage plants.

Our siting strategy will co-locate industrial scale DAC + mineralization plants with privately owned geothermal power operations to directly tap into waste heat and generated electricity and, where economical, repurpose existing wells for CO2 injection. We have identified two options for our pilot site (Figure 2) and are negotiating the terms of a usage agreement with the respective owners of these geothermal concessions, which will include options for low-cost energy sources for our DAC partners. Because of the aforementioned regulatory regime governing Kenya's geothermal sector, we are able to operate under the existing exploration and exploitation licenses held by these partners to implement a water-dissolved method, enabling rapid deployment and scaling.

This application is specifically focused on the northern site, where, pending success of a 300 tCO2 pilot, we will begin Phase 1 with our DAC partners at ~2,200 tCO2/yr by 2024 ("this project"). Here, the site owner is developing a 140MW geothermal power plant which will come online in Q2 2023, generating enough electrical energy to power a ~3 MtCO2/yr DAC + mineralization operation, with an overall storage capacity for this concession to be as much as ~11.2 GtC.

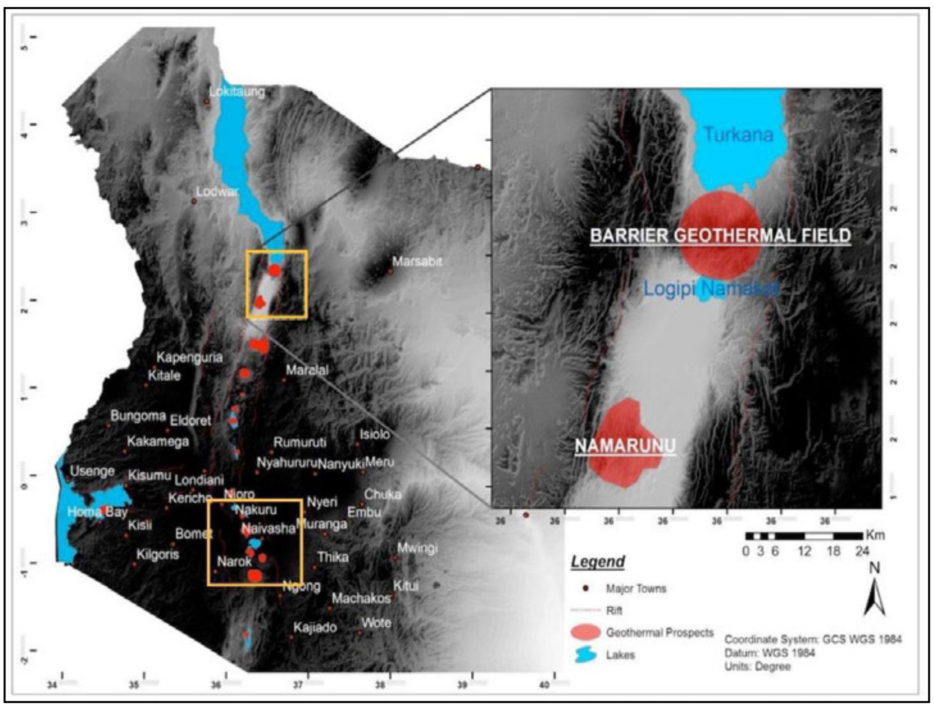


Figure 2. Project site locations (yellow boxes) in Kenya's Rift Valley.

**Our approach:**

In situ mineralization entails dissolving CO2 into water, injecting water-charged CO2 into basaltic rock, and inducing geochemical reactions that dissolve the basalt and subsequently cause the precipitation of carbonate minerals for permanent storage underground (Oelkers et al., 2008, Gislason and Oelkers, 2014). Cella will employ a new method of co-injecting CO2 with saline water + geothermal brine waste with a 100% water recovery margin, circumventing issues of water demand and enabling global access to this technology. This serves a two-fold purpose of carbon dioxide sequestration and the disposal of geothermal brine, which otherwise has been known to pollute surface fresh water sources. Kenya's vast resources of salty ground and surface water, in addition to its proximity to the coast, contribute to the scalability of this new technology in this location. The favorable geology and immense geothermal energy industry uniquely positions Kenya to be a global carbon removal hub, where DAC companies will enjoy the plentiful and ever-growing supply of renewable energy co-located with a permanent and safe storage service for CO2. In terms of our partnership model with DAC companies, the best way to scale in the immediate term is through charging a per-ton fee to DAC partners. This enables us to focus on our core business of mineral storage and MRV as a service. This, alongside working with our local partners to identify and develop other key pillars, such as options for inexpensive energy, is crucial for scaling a CDR ecosystem in Kenya. Positive initial engagement with interested DAC partners makes us confident that our near-term model of a water-dissolved injection method providing storage for multiple DAC companies in Kenya will achieve a climate-relevant impact.

Our overall goal at Cella is to increase the supply of high-quality carbon removal credits by providing a durable storage service for DAC companies at climate-relevant scale. This can only be achieved through developing and researching mineral carbon storage in new locations. Kenya is the optimal first deployment site that will enable Cella to develop and prove operational capacities and unit economics allowing us to scale globally. For example, the unique geology of our debut location allows us to innovate new injection techniques involving pure-phase (supercritical) CO2 injections that maximize the per-well CO2 capacity while improving storage efficiency at scale. Developing novel injection methods will accelerate the implementation of in-situ mineralization in a wide range of settings, including potentially offshore. Finally, providing our customers with the highest-quality verification of permanent storage is at the core of our values, and we will establish comprehensive and low-cost MRV techniques to verify mineralization at depth. With our projections reaching $9/ton by the end of the decade, we will approach the cost of traditional geologic storage in saline formations. We are confident that these advancements will put us on a path to rapidly become the market leader in both mineral storage capacity and cost.

b. What is the current technology readiness level (TRL)? Please include performance and stability data that you've already generated (including at what scale) to substantiate the status of your tech.

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c. What are the key performance parameters that differentiate your technology (e.g. energy intensity, reaction kinetics, cycle time, volume per X, quality of Y output)? What is your current measured value and what value are you assuming in your nth-of-a-kind (NOAK) TEA?

| **Key performance parameter** | **Current observed value (units)** | **Value assumed in NOAK TEA (units)** | **Why is it feasible to reach the NOAK value?** |
|---|---|---|---|
| Per-well injection capacity- water dissolved method | 300 tons | 50,000 tons | Fresh basalt with extremely high permeability, and high permitted water use per minute rates enable us |

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| | | | to quickly scale the amount of $CO_2$ we inject into each well with the water-dissolved method. |
| $CO_2$ compression energy requirements | 100 kwhr/ton $CO_2$ | 70 kwhr/ton $CO_2$ | The high water column at our site enables sufficient hydrostatic pressure to inject $CO_2$ at lower partial pressures, while still avoiding exsolution. This will minimize $CO_2$ compression energy costs at the surface. |
| Per-well injection capacity | 50,000 tons* | 0.5 MT | Our site contains an impermeable cap rock layer at depth, enabling us to safely experiment with novel techniques of pure-phase $CO_2$ injection, drastically improving per-well capacity from the best value for the water-dissolved method*. |

d. Who are the key people at your company who will be working on this? What experience do they have with relevant technology and project development? What skills do you not yet have on the team today that you are most urgently looking to recruit?

Our team combines industry-leading scientific expertise and proven experience delivering climate positive impact at scale in emerging markets. Dr. Claire Nelson (co-founder, CSO) is a postdoctoral research scientist at Columbia University's Lamont-Doherty Earth Observatory, an institution with a clear record of pioneering science that is the basis for the CDR industry today. She is a geochemist whose current research is focused on innovating novel injection strategies that optimize mineralization during large-scale injections of carbon into basalt. Her Ph.D. research at Northwestern University investigated basalt chemical weathering from the atomic to the regional scale in both subsurface and surficial environments, where she specifically developed novel isotopic tracer tools to quantify geochemical reactions involving basalt and carbon. Corey Pattison (co-founder, CEO) brings a decade of experience developing and managing large-scale climate adaptation and renewable power projects in Africa, both at the World Bank and as an advisor to billion-dollar climate finance initiatives. Catherine Berner supports development of Cella's commercial roadmap and go-to-market strategy. She brings deep operational experience designing and building award-winning factories while leading the product division at a venture-backed Kenyan startup. She has an MBA from Stanford and has worked as a private equity investor focused on carbon capture technologies. Their experience scaling large and impactful operations in emerging markets, deep familiarity with large sources of concessional finance, along with Claire's technical background, amount to the ideal combination of skills and experience that enable us to deliver a high-quality product that provides clear additionality, durability, and scale. We are joined by scientific advisors who have pioneered the field of carbon mineralization in basalt with a ~20-year track record of developing and innovating this carbon storage technology. Our scientific team includes the world's foremost experts on mineral carbon storage, senior geothermal engineers with experience designing carbon injection systems, and geologists whose academic research is specifically focused on carbon storage potential of Kenyan Rift basalts.

Our priority hires are to build engineering capacity for design and oversight of injection system

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| construction. |

e. Are there other organizations you're partnering with on this project (or need to partner with in order to be successful)? If so, list who they are, what their role in the project is, and their level of commitment (e.g., confirmed project partner, discussing potential collaboration, yet to be approached, etc.).

| **Partner** | **Role in the Project** | **Level of Commitment** |
|---|---|---|
| Olsuswa Energy Ltd. | Landowner and geothermal energy generation for DAC | Advanced discussions on site access and collaboration (LOI) |
| Marine Power Generation Ltd. | Landowner and geothermal energy generation for DAC | Advanced discussions on site access and collaboration |
| Geothermal Development Company | Assessment and evaluation of geothermal resources; well owner; steam provider | Preliminary discussions regarding research collaboration for expansion |
| Parallel Carbon Inc. | DAC partner | Advanced discussions on co-deployment |
| AirMyne Inc. | DAC partner | Advanced discussions on co-deployment |
| Sustaera Inc. | DAC partner | Advanced discussions on co-deployment |
| Captura Inc. | DAC partner | Advanced discussions on co-deployment |
| Climate Action Platform Africa | Public sector engagement strategy; establishing new local partnerships; identifying opportunities for DAC+mineralization to unlock climate-smart growth | Confirmed project partner |
| EED Advisors | Advisory support on Kenyan energy market | Initial discussions |
| Dr. Eric Oelkers- CNRS Toulouse | Lead Scientific Advisor | Confirmed project partner |
| Dr. David Goldberg- Columbia University | Scientific Advisory Committee | Confirmed project partner |
| Dr. Lydia Olaka- Technical University Kenya | Scientific Advisory Committee- Research partner; advisor on Kenyan hydrology, geology | Confirmed project partner and scientific consultant |

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| George Okoko | Student Researcher/Collaborator | Confirmed project collaborator |
| Maasai Human Rights Defenders | Local community engagement | Confirmed project partner |
| DAC Coalition | Increasing visibility of project and networking with potential DAC partners | Confirmed partner (Cella is a member) |

f. What is the total timeline of your proposal from start of development to end of CDR delivery? If you're building a facility that will be decommissioned, when will that happen?

We aim to conclude our pilot experiment by Q1 2024 and begin commercial deployment immediately thereafter, with CDR delivery in Q4 2024.

g. When will CDR occur (start and end dates)? If CDR does not occur uniformly over that time period, describe the distribution of CDR over time. Please include the academic publications, field trial data, or other materials you use to substantiate this distribution.

By Q2 2024, we will begin our Phase 1 CDR alongside a DAC partner (this project), starting CDR at a rate of 2,200 tons/well/year. With sufficient DAC capacity, the rate of CDR will immediately increase to 50,000 tons/well/year in 2025. By adding more wells and DAC capacity to this site, CDR will continue uniformly beyond 2060 at a rate of 3.07 MT/year, limited by the energy demand of DAC. With parallel scaling at our second site (Southern Kenya), using capacity estimates from Weise et al (2008), our theoretical storage capacity is 1.7-22.0 GtC.

h. Please estimate your gross CDR capacity over the coming years (your total capacity, not just for this proposal).

| Year | Estimated gross CDR capacity (tonnes) |
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| 2023 | 300 ton pilot |
| 2024 | 2,200 ton DAC phase 1 (this project) |
| 2025 | 100,000 ton DAC phase 2 |
| 2026 | 150,000 ton DAC phase 3 |
| 2027 | 367,270 tons |
| 2028 | 731,573 tons |

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| 2029 | 1,457,237 tons |
| 2030 | 3,066,000 tons |

i. List and describe at least three key milestones for this project (including prior to when CDR starts), that are needed to achieve the amount of CDR over the proposed timeline.

| | **Milestone description** | **Target completion date** (eg Q4 2024) |
|---|---|---|
| 1 | **Secure site access and energy generation options for DAC:** we've identified two potential sites which could store ~50,000 $tCO_2$/year at each well. The overall storage capacity at the best-studied concession (this project's site) is estimated at 700 Mt to 11.2 GtC. We are in advanced discussions on access agreement and energy use, as well as supplemental energy development. Energy generation at this site currently will support a 3.07 MT/yr DAC plant. We have signed a LOI with one site owner. Our goal is to make a final selection and reach agreement by the end of November 2022. | Q4 2022 |
| 2 | **Complete site characterization:** seismic tomography subsurface imaging; downhole analysis of existing wells for core samples/chip analysis (mineralogy, XRD, rxn rates); aqueous geochemistry (major ions, pH, T, saturation indices) for both subsurface characterization and pre-injection baseline; simulation of pilot injection for volumetrics and timeline assessment. | Q1 2023 |
| 3 | **Complete construction of demo injection site.** Well drilling completed and injection, monitoring, and water recycling infrastructure built. $CO_2$ for pilot obtained and site-specific injection parameters fully designed. | Q4 2023 |
| 4 | **Successful pilot injection**: The successful execution of a pilot injection of 300 $TCO_2$ is fundamental to proving the concept; we can use the injection system to scale up to ~50,000 $TCO_2$ for commercial use by Q4 24 with minor modifications. | Q1 2024 |
| 5 | **Co-deployment with DAC to commence commercial operations:** carbon capture combined with durable storage is necessary for carbon removal and, thus, to generate the credits for this pre-purchase. We've signed LOIs with DAC partners and are in active discussions with others. The timeline envisaged here aligns well with their deployment strategies. Though we do not seek at this point to be a provider of energy generation ourselves, we are in discussions with local partners, including project site owners, on arrangements that would unlock options for cheap energy (heat and electrical) that will enable DAC colocation with our injection site. | Q2 2024 |

j. What is your IP strategy? Please link to relevant patents, pending or granted, that are available publicly (if applicable).

> Our current strategy is to protect our injection and MRV methods through the use of trade secrets, as well as cultivating a team of the world's experts on basalt mineralization, which is only a handful of people. Please see confidential addendum for further plans for IP.

k. How are you going to finance this project?

> We will finance storage-specific capex and opex of the project through a mix of equity and grant financing. After consulting with development financing organizations, we believe that concessional financing is a potentially viable option for our subsequent fundraising rounds that will scale our injection capacities. There are immediate opportunities to raise and deploy concessional financing to cover the development of off-grid solar PV to provide cost-attractive electricity for DAC partners.

l. Do you have other CDR buyers for this project? If so, please describe the anticipated purchase volume and level of commitment (e.g., contract signed, in active discussions, to be approached, etc.).

> We have had initial discussions with SwissRe about the project.

m. What other revenue streams are you expecting from this project (if applicable)? Include the source of revenue and anticipated amount. Examples could include tax credits and co-products.

> We are not currently expecting additional forms of revenue; however, there is potential that a byproduct of the DAC+mineralization partnerships could result in a hydrogen production, which may be incorporated into the operations of the geothermal partner hosting the project site.

n. Identify risks for this project and how you will mitigate them. Include technical, project execution, ecosystem, financial, and any other risks.

| Risk | Mitigation Strategy |
|---|---|
| Project execution: ability to attract requisite talent; source construction material; transport materials and staff to potentially remote locations | Kenya hosts the world's eighth largest geothermal installed capacity globally, and with that there is plentiful local engineering and technologically-relevant talent for subsurface injection and monitoring. This applies also to the machinery and materials needed to drill injection wells and construct our injection system. We have already begun talent outreach and have an initial pool of qualified candidates for early project hires. We are also in discussion with companies that provide well drilling services. We are in advanced discussions |

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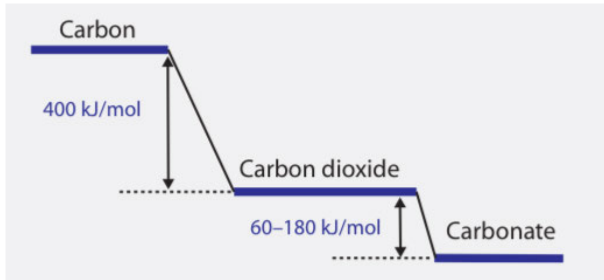
| | regarding two potential project sites. While one is located in a remote region in Kenya (Turkana), thus elevating project execution risks, the active development of a 140MW geothermal production plant on the site means that there is project-specific transport infrastructure and drilling services on site that will significantly mitigate the need for Cella to manage these challenges ourselves, as the utilization of these services is included in the access agreement currently under discussion. |
| Attracting (mostly US-based) DAC partners: We will be a first-of-its-kind anchor for an engineered carbon removal ecosystem in Africa. As the great majority of DAC partners are in North America and Europe, there is some uncertainty regarding the speed and scale with which they may deploy in Kenya. | We are proactively engaging potential DAC partners far upstream in our development to ensure that we are able to address their concerns and make Kenya an attractive DAC partner. Through this initial outreach we've seen significant interest in partnering with us in Kenya. We are in active discussion with several potential DAC partners, listed in the partnership section, and have signed LOIs with at least two by the time of this application. These partners have confirmed their intent to deploy in Kenya, if there is durable storage. The essential first step is proving storage, why a pre-purchase from Frontier would be catalytic in creating a Kenyan CDR ecosystem. Through supporting the initial construction and deployment of our commercial storage operation, a Frontier pre-purchase would effectively create an immediate financial incentive for DAC companies, as well as highlight the viability of a Kenyan CDR industry, sending a strong signal to both capture companies as well as funders and offtakers. |
| Unclear policy environment: Kenya currently hosts a dynamic market for reforestation and afforestation, but the government's regulatory stance on carbon removals as they scale is currently, like many countries, uncertain. In particular, this implicates import duties, taxation, and the potential creation of fiscal or other economic incentives. | Through our partners, who have developed strong working relationships in Kenyan climate tech and regulation thereof over many years, we are actively engaging directly with relevant authorities in the Ministries of Energy and Environment to help shape an enabling policy environment to grow a climate-relevant carbon removal ecosystem in Kenya. |

## 2. Durability

a. Describe how your approach results in permanent CDR (> 1,000 years). Include citations to scientific/technical literature supporting your argument. What are the upper and lower bounds on your durability estimate?




Mineral storage is entirely permanent and durable, with storage persisting for millions of years. The diagram above (credit: D. Goldberg) illustrates that mineralized carbon is the most thermodynamically stable form of carbon at shallow Earth conditions, as evidenced by the fact that >95% of all carbon on Earth is in lithologic form (Bates, 2019). The lowest temperature where calcite may begin to decarbonate is ~720C (Sharp et al., 2003); thus, with the absence of heating to this temperature, mineralized carbon will be stored permanently. By way of example, mineralized carbon is present in natural basalt formations from East Iceland that dated to >13 million years old (Neuhoff et a., 1999) as well as 55 million-year-old basalts from East Greenland (Neuhoff et al., 1997), and these minerals are thought to form shortly after the basaltic eruptions (Andrews and Jacobson, 2017), clearly indicating durability over geologic timescales.

b. What durability risks does your project face? Are there physical risks (e.g. leakage, decomposition and decay, damage, etc.)? Are there socioeconomic risks (e.g. mismanagement of storage, decision to consume or combust derived products, etc.)? What fundamental uncertainties exist about the underlying technological or biological process?

As stated above, the only way to reverse the permanence of mineral storage is heating to hundreds of degrees C, a process that would require a major tectonic or volcanic event.

## 3. Gross Removal & Life Cycle Analysis (LCA)

a. How much GROSS CDR will occur over this project's timeline? All tonnage should be described in **metric tonnes** of $CO_2$ here and throughout the application. Tell us how you calculated this value (i.e., show your work). If you have uncertainties in the amount of gross CDR, tell us where they come from.

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| Gross tonnes of CDR over project lifetime | 2,200 |
| Describe how you calculated that value | Geothermal completion tests performed at our site indicate a high injectivity potential, corresponding to extremely permeable subsurface formations. Modeled per-well injection capacities based on local permeability and our geothermal partners permitted water |

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| | injection rates indicate a maximum of ~136.9 tons CO2/well/day. By stepwise increasing our injection rates to this value starting at a conservative rate of ~6 tons/well/day (2,200 tons/well/yr- primarily limited by DAC scale-up), we will confirm our geostatic model of the subsurface and calibrate our expected time-to-mineralization calculations. |

b. How many tonnes of $CO_2$ have you captured and stored to date? If relevant to your technology (e.g., DAC), please list captured and stored tons separately.

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c. If applicable, list any avoided emissions that result from your project. For carbon mineralization in concrete production, for example, removal would be the $CO_2$ utilized in concrete production and avoided emissions would be the emissions reductions associated with traditional concrete production. Do not include this number in your gross or net CDR calculations; it's just to help us understand potential co-benefits of your approach.

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| While this project is specific to our co-deployment with DAC, we plan to incorporate existing technologies (e.g., Gunnarsson et al., 2018) to capture and store emissions from the co-located geothermal operation. At full capacity for this particular site, this would include ~13,533 tons CO2/year of avoided emissions. |

d. How many GROSS EMISSIONS will occur over the project lifetime? Divide that value by the gross CDR to get the emissions / removal ratio. Subtract it from the gross CDR to get the net CDR for this project.

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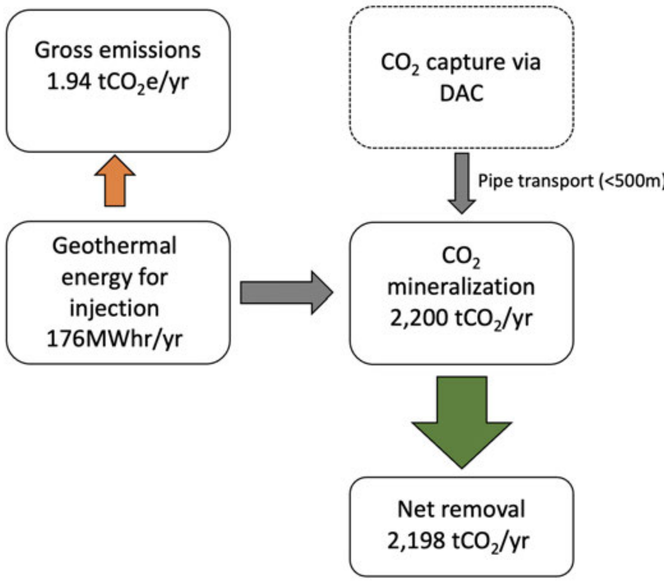
| Gross project emissions over the project timeline *(should correspond to the boundary conditions described below this table)* | 1.94tCO2 |
| Emissions / removal ratio *(gross project emissions / gross CDR–must be less than one for net-negative CDR systems)* | 0.0001 |
| Net CDR over the project timeline *(gross CDR - gross project emissions)* | 2,198.1 tCO2 |

e. Provide a process flow diagram (PFD) for your CDR solution, visualizing the project emissions numbers above. This diagram provides the basis for your life cycle analysis (LCA). Some notes:

- The LCA scope should be cradle-to-grave

- For each step in the PFD, include all Scope 1-3 greenhouse gas emissions on a $CO_2$ equivalent basis
- Do not include CDR claimed by another entity (no double counting)
- For assistance, please:
  - Review the diagram below from the CDR Primer, Charm's application from 2020 for a simple example, or CarbonCure's for a more complex example
  - See University of Michigan's Global $CO_2$ Initiative resource guide
- If you've had a third-party LCA performed, please link to it.




f. Please articulate and justify the boundary conditions you assumed above: why do your calculations and diagram include or exclude different components of your system?

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| Our core business is focused exclusively on storage, thus the boundary conditions for this analysis cover CO2 reception to mineralization, excluding emissions associated with DAC. Energy needs within this boundary cover pressurization of CO2 for injection. This electrical energy will come entirely from the co-located geothermal operation. |

g. Please justify all numbers used to assign emissions to each process step depicted in your diagram above. Are they solely modeled or have you measured them directly? Have they been independently measured? Your answers can include references to peer-reviewed publications, e.g. Climeworks' LCA paper.

| Process Step | $CO_2$(eq) emissions over the project lifetime (metric tonnes) | Describe how you calculated that number. Include references where appropriate. |
|---|---|---|
| Pressurization | 1.94tCO2e | The energy needs for this process step are electrical |

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| and injection of aqueous CO2 | | and will be sourced from geothermally produced electricity. Fugitive emissions of carbon dioxide and methane, due to the release of NCGs from produced steam, will account for project emissions in this step. We have modeled our emissions using the measured mass fraction of CO2+methane in steam emitted from the Olkaria geothermal plant in Kenya ~11.4g/kwh (Mutia 2010), which is the same size/capacity as our colocated plant. We multiplied that ratio by our projected electricity needs for this project to arrive at our emissions estimate. |

## 4. Measurement, Reporting, and Verification (MRV)

Section 3 above captures a project's lifecycle emissions, which is one of a number of MRV considerations. In this section, we are looking for additional details on your MRV approach, with a particular focus on the ongoing quantification of carbon removal outcomes and associated uncertainties.

a. Describe your ongoing approach to quantifying the CDR of your project, including methodology, what data is measured vs modeled, monitoring frequency, and key assumptions. If you plan to use an existing protocol, please link to it. Please see Charm's bio-oil sequestration protocol for reference, though note we do not expect proposals to have a protocol at this depth at the prepurchase stage.

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| We will monitor soil CO2 gas flux against background measurements that have been made at the concession site since 1993 using the procedure described by Fridriksson et al. (2006), taking measurements once a month for the first year, and once a year thereafter. Where monitoring well temperatures are high, we will use the geothermal sampling and analysis method described by Arnorsson et al., (2006) and Clark et al., (2020). Injectivity will be assessed by measuring the outflow rate of the monitoring fluid over time to ensure no changes in formation permeability (Gunnarsson et al., 2018). Monitoring fluid samples will be collected biweekly for the first year, bi-monthly for the subsequent 5 years, and twice annually for the remainder of the well lifetime and analyzed with the methods outlined in Snæbjörnsdóttir et al. (2017) and Nelson et al. (2022). |

b. How will you quantify the durability of the carbon sequestered by your project discussed in 2(b)? If direct measurement is difficult or impossible, how will you rely on models or assumptions, and how will you validate those assumptions? *(E.g. monitoring of injection sites, tracking biomass state and location, estimating decay rates, etc.)*

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| Durability of CDR will be established via proof of mineralization. The pilot and Phase 1 DAC (this project) will include reactive and unreactive tracer injections described in Matter et al. (2016), where mass balance calculations will be compared to measured data to quantify mineralized CO2. Ongoing direct measurements of monitoring fluid aqueous geochemistry will be performed thereafter to ensure continuous mineralization. Samples will be further analyzed according to our proprietary monitoring |

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| technique (see confidential addendum) to ensure highest-quality verification of mineralization. |

c. This tool diagrams components that we anticipate should be measured or modeled to quantify CDR and durability outcomes, along with high-level characterizations of the uncertainty type and magnitude for each element. We are asking the net CDR volume to be discounted in order to account for uncertainty and reflect the actual net CDR as accurately as possible. Please complete the table below. Some notes:

- In the first column, list the quantification components from the Quantification Tool relevant to your project (e.g., risk of secondary mineral formation for enhanced weathering, uncertainty in the mass of kelp grown, variability in air-sea gas exchange efficiency for ocean alkalinity enhancement, etc.).
- In the second column, please discuss the magnitude of this uncertainty related to your project and what percentage of the net CDR should be discounted to appropriately reflect these uncertainties. Your estimates should be based on field measurements, modeling, or scientific literature. The magnitude for some of these factors relies on your operational choices (i.e., methodology, deployment site), while others stem from broader field questions, and in some cases, may not be well constrained. We are not looking for precise figures at this stage, but rather to understand how your project is thinking about these questions.
- See this post for details on Frontier's MRV approach and a sample uncertainty discount calculation and this Supplier Measurement & Verification Q&A document for additional guidance.

| **Quantification component**<br>Include each component from the Quantification Tool relevant to your project | **Discuss the uncertainty impact related to your project**<br>Estimate the impact of this component as a percentage of net CDR. Include assumptions and scientific references if possible. |
|---|---|
| *Storage Leakage* | *<1%. Mineral storage has been proved as durable and secure in relevant environments. Moreover, employing a water-dissolved method ensures immediate storage via solubility trapping (Sigfusson et al., 2015). While existing literature focuses on freshwater-dissolved CO2, we are employing a new technique of saline groundwater+geothermal brine-dissolved CO2. We have designed our injection parameters to account for CO2 solubility differences between these methods, thus we anticipate that our pilot will prove equally negligible risk.* |
| Storage Quantification | 0% uncertainty. The quantification tool states that storage can be "quantified directly as a metered output from the DAC system". As we described above, we will quantify storage through geochemical monitoring of formation fluids to separately verify CDR. |
| Storage monitoring and maintenance | 0%. As stated in the linked quantification tool, durability is sufficiently established by "demonstration that the stable form has been achieved"; thus, there is no ongoing liability risk. |

d. Based on your responses to 4(c), what percentage of the net CDR do you think should be discounted for each of these factors above and in aggregate to appropriately reflect these uncertainties?

| |
|---|
| 0% |

e. Will this project help advance quantification approaches or reduce uncertainty for this CDR pathway? If yes, describe what new tools, models or approaches you are developing, what new data will be generated, etc.?

| |
|---|
| Yes, see confidential addendum. |

f. Describe your intended plan and partners for verifying delivery and registering credits, if known. If a protocol doesn't yet exist for your technology, who will develop it? Will there be a third party auditor to verify delivery against that protocol or the protocol discussed in 4(a)?

| |
|---|
| For the proposed project, Cella will provide evidence of mineralization to our DAC partners, who will register and sell credits. |

## 5. Cost

We are open to purchasing high-cost CDR today with the expectation the cost per tonne will rapidly decline over time. The questions below are meant to capture some of the key numbers and assumptions that you are entering into the separate techno-economic analysis (TEA) spreadsheet (see step 4 in Applicant Instructions). There are no right or wrong answers, but we would prefer high and conservative estimates to low and optimistic. If we select you for purchase, we'll work with you to understand your milestones and their verification in more depth.

a. What is the levelized price per net metric tonne of $CO_2$ removed for the project you're proposing Frontier purchase from? This does not need to exactly match the cost calculated for "This Project" in the TEA spreadsheet (e.g., it's expected to include a margin), but we will be using the data in that spreadsheet to consider your offer. Please specify whether the price per tonne below includes the uncertainty discount in the net removal volume proposed in response to question 4(d).

| |
|---|
| $227/tonne $CO_2$ |

b. Please break out the components of this levelized price per metric tonne.

| Component | Levelized price of net CDR for this project ($/tonne) |
|---|---|
| Capex | $52 |

| | |
|---|---|
| Opex (excluding measurement) | $160 |
| Quantification of net removal (field measurements, modeling, etc.)[2] | $15 |
| Third party verification and registry fees (if applicable) | |
| **Total** | $227 |

c. Describe the parameters that have the greatest sensitivity to cost (e.g., manufacturing efficiencies, material cost, material lifetime, etc.). For each parameter you identify, tell us what the current value is, and what value you are assuming for your NOAK commercial-scale TEA. If this includes parameters you already identified in 1(c), please repeat them here (if applicable). Broadly, what would need to be true for your approach to achieve a cost of $100/tonne?

| Parameter with high impact on cost | Current value (units) | Value assumed in NOAK TEA (units) | Why is it feasible to reach the NOAK value? |
|---|---|---|---|
| Annual CO2 sequestration capacity per well | 2,200 | 50,000 | Each well has an expected capacity of 50,000 tonnes CO2/yr based on formation permeability and water abstraction rates allowable by our permits. We expect to reach 80% of this with minimal change to operations. We are starting at a small scale to prove local viability, but will expand well capacity without the need for further capital investment. |
| Electricity Cost | $ 100/MWh | $80/MWh | At scale, we will partner directly with geothermal energy producers which will lock in a low cost of electricity. |
| Operating Labor | $72/tCO2 | $4 /tCO2 | Both the current project and NOAK will have operating labor associated with one well. For this project, we include significantly more labor costs per tonne sequestered. We expect the cost of this to significantly decline for future projects as we advance our operational expertise and increase well capacity. |

d. What aspects of your cost analysis are you least confident in?

[2] This and the following line item is not included in the TEA spreadsheet because we want to consider MRV and registry costs separately from traditional capex and opex.

The capital costs of the project are the largest unknown because there are no similar projects outside of Iceland. The accuracy of our capital cost estimate will improve as we move forward with site design and start engaging with engineering firms.

e. How do the CDR costs calculated in the TEA spreadsheet compare with your own models? If there are large differences, please describe why that might be (e.g., you're assuming different learning rates, different multipliers to get from Bare Erected Cost to Total Overnight Cost, favorable contract terms, etc.).

The largest difference is the assumed discount rate and cost of capital. We believe that we can access concessional finance that will give us a cost of capital significantly lower than assumed in the TEA spreadsheet.

f. What is one thing that doesn't exist today that would make it easier for you to commercialize your technology? (e.g., improved sensing technologies, increased access to X, etc.)

Increased access to more injection projects via regulatory support. For example, an addendum to or revision of the U.S. EPA VI permit requirements that are specific to injection of water-dissolved $CO_2$ would streamline our global expansion plans. Similarly, while the regulatory framework in Kenya currently allows for water-dissolved-$CO_2$ injection, a policy framework allowing for pure-phase $CO_2$ injection in Kenya would enable us to demonstrate and scale our novel injection methods.

## 6. Public Engagement

In alignment with Frontier's Safety & Legality criteria, Frontier requires projects to consider and address potential social, political, and ecosystem risks associated with their deployments. Projects with effective public engagement tend to:

- Identify key stakeholders in the area they'll be deploying
- Have mechanisms in place to engage and gather opinions from those stakeholders, take those opinions seriously, and develop active partnerships, iterating the project as necessary

The following questions help us gain an understanding of your public engagement strategy and how your project is working to follow best practices for responsible CDR project development. We recognize that, for early projects, this work may be quite nascent, but we are looking to understand your early approach.

a. Who have you identified as relevant external stakeholders, where are they located, and what process did you use to identify them? Please include discussion of the communities potentially engaging in or impacted by your project's deployment.

Our primary stakeholders include communities proximate to our planned project site in Kenya; owners of the land encompassing this site; geothermal and solar power developers; local, regional, and national government and DAC companies. These stakeholders are primarily located in Turkana, Naivasha, and Nairobi, Kenya, and the US. To begin identification and outreach to local communities and public authorities we've worked closely with our local partners who have an existing presence in these areas, including the World Bank's Social Sustainability and Inclusion unit in Kenya and Climate Action Platform Africa. Through these partners we connected with local environmental and indigenous rights organizations; namely, the Ogie Peoples Organization, the Wangari Maathai Organization, and Maasai human rights defenders, the Geothermal Development Company and the Kenyan government. We are particularly sensitive to the need to engage upstream with local communities and indigenous groups, like the Maasai community, who, as pastoralists, have seen their ability to practice traditionally nomadic restricted by the development of geothermal production in that region. Given the importance of geothermal partners for DAC+mineralization, it is a priority for us to ensure that we develop feedback channels with local communities and partners directly to ensure that our aims and impacts are well understood and, where possible, we can provide models of community consultation for our geothermal partners, as well. Our engagement with government is informed by pre-existing and ongoing efforts by Climate Action Platform Africa to support the Kenya government—and, particularly, the Ministry of Energy—in understanding the potential role that DAC+mineralization can play in driving down the cost of electricity through attracting anchor industrial demand and associated investment and integrating that vision into medium-term national planning, as reflected in the government's Energy Sector Roadmap 2040 draft white paper. Finally, we have engaged with DAC companies we've connected to through our membership in the DAC Coalition and through CDR community events.

b. If applicable, how have you engaged with these stakeholders and communities? Has this work been performed in-house, with external consultants, or with independent advisors? If you do have any reports on public engagement that your team has prepared, please provide. *See Project Vesta's community engagement and governance approach as an example and Arnestein's Ladder of Citizen Participation for a framework on community input.*

At Cella, engaging with communities upstream, with transparency and inclusion as guiding principles, is a core part of who we are—our team brings a decade of experience designing and executing stakeholder engagement strategies—and we believe it is an important in-house capacity. To develop our strategy for this project we've followed a snowball approach in which we've worked through trusted existing partners, outlined above, to both broaden and localize our network. In this way we've connected with local environmental NGOs and indigenous rights groups during the first half of 2022 and in August 2022 traveled to Naivasha to hold an initial round of consultations to socialize the project concept and listen to potential and current concerns. One outcome of these local consultations was agreement to develop a regular schedule of community consultations, organized by a leading Maasai human rights advocate, and to develop a more systematic means mechanism for two-way communication between Cella and local communities.

c. If applicable, what have you learned from these engagements? What modifications have you already made to your project based on this feedback, if any?

With reference to the local consultations noted above, other key outcomes included grievances over the lack of consultation from geothermal developers to date, as well as pollution from geothermal brine disposal in local surface fresh water sources. To help address the latter, we've focused our near-term injection method on mixing carbon dioxide with the geothermal brine waste. As noted above, this technique is immediately implementable under the regulatory framework in Kenya, and it can aid in the disposal of geothermal brine, in addition to carbon sequestration. Regarding DAC partners, we've generally engaged on a bilateral basis. We are currently exploring process modifications to take advantage of the various technical advantages of these partners–e.g. operating on an intermittent basis to take advantage of potentially cheaper energy grid resources that may be accessed with a time-of-use tariff; hosting a dilute stream of CO2; and use of brackish water sources–and enable our ability to scale rapidly by hosting a variety of DAC partners.

d. Going forward, do you have changes to your processes for (a) and (b) planned that you have not yet implemented? How do you envision your public engagement strategy at the megaton or gigaton scale?

We are currently working with a local Maasai group to systematize regular consultations, and we will need to develop capacity to implement this as well as build a more real-time platform to receive community feedback and respond. This is an in-house capacity we plan to onboard in Q2 2023. Given pre-existing reputational risks with the geothermal industry in Kenya, vis-a-vis local communities, we will need to also develop a proactive communications strategy to ensure that the objectives, risks, and impacts of Cella's activities are clearly understood. These activities, as well as a careful vetting of our land and energy providing partners will continue to be a core part of our scaling strategy, including beyond Kenya.

## 7. Environmental Justice[3]

As a part of Frontier's Safety & Legality criteria, Frontier seeks projects that proactively integrate environmental and social justice considerations into their deployment strategy and decision-making on an ongoing basis.

a. What are the potential environmental justice considerations, if any, that you have identified associated with your project? Who are the key stakeholders? Consider supply chain impacts, worker compensation and safety, plant siting, distribution of impacts, restorative justice/activities, job creation in marginalized communities, etc.

A Kenya CDR deployment entails several important opportunities to act on environmental justice. The first is that, with ~92% of Kenya's grid already being powered by renewable energy (and a target of 100% by 2030), CDR in Kenya inherently avoids difficult tradeoffs in the use of renewable energy, which, from a climate impact perspective, are best used to replace existing fossil fuels in contexts where those continue to serve the grid. In fact, because of the paradoxes of investment and development of the energy sector in emerging markets–whereby prices remain high because of lack of industrial demand and investment–CDR deployment in Kenya can play a critical role in bringing down the price of electricity through providing that anchor demand, potentially enabling energy access for millions of mostly rural households through a model of climate-smart growth. At the same time, there are environmental justice concerns, if the project contributes to environmental damage and/or social and economic inequality. These concerns are elevated in Kenya, as a country subject to the greatest impacts of climate change despite having contributed exceedingly marginally to the climate crisis. It is worth noting, however, that the distribution of benefits deriving from our efforts to address

[3] For helpful content regarding environmental justice and CDR, please see these resources: C180 and XPRIZE's Environmental Justice Reading Materials, AirMiners Environmental and Social Justice Resource Repository, and the Foundation for Climate Restoration's Resource Database

the crisis (e.g. in terms of technological transfer and investment) are emerging alongside climate impacts as vastly unequal: CDR is a projected $50 billion industry by 2030 that is currently largely focused on developing and deploying potentially valuable technologies in high emitting countries. With favorable geology; plentiful renewable energy sources; an existing regulatory framework for subsurface injection; and a young, technically-suited workforce, we believe strongly that Kenya represents one of the most promising CDR deployment sites globally and an opportunity to address this imbalance.

b. How do you intend to address any identified environmental justice concerns and / or take advantage of opportunities for positive impact?

We believe that the best way to achieve the opportunities for positive impact stated above is the successful delivery of our Kenyan project. As the first of its kind deployment in Africa, we encounter regular skepticism about this deployment strategy in spite of its merits, and thus the strongest argument for broader geographical distribution of CDR is practical demonstration of mineralization through our pilot, attracting DAC partner(s), and proving competitive unit economics through scaling. We are committed to relying 100% on renewable energy sources, so our ability to deliver on these latter two milestones will inherently contribute to unlocking affordable electricity in Kenya through creating anchor demand for scaling geothermal, solar, and wind generation capacity. Finally, through incorporating the use of geothermal brine, a potential water source pollutant, in our injection techniques, we are contributing to a cleaner and healthier environment in the communities where we work.

## 8. Legal and Regulatory Compliance

a. What legal opinions, if any, have you received regarding deployment of your solution?

We have consulted with partners leading government engagement as well as geothermal partners on the regulatory environment for subsurface injection. The consensus opinion we have received is that Kenya's existing regulatory regime governing the geothermal sector provides for the water dissolved approach. Our local legal counsel is currently undertaking a comprehensive and exhaustive review of all relevant laws.

b. What permits or other forms of formal permission do you require, if any, to engage in the research or deployment of your project? What else might be required in the future as you scale? Please clearly differentiate between what you have already obtained, what you are currently in the process of obtaining, and what you know you'll need to obtain in the future but have not yet begun the process to do so.

Our go to market strategy relies on partnership with private sector geothermal production companies who have operational exploration and exploitation licenses from the Kenyan Ministry of Energy. Our usage agreements with these partners will cover the ability for Cella to operate under these existing licenses, which are linked to the concession. We plan to go beyond our legal requirement and undertake an independent environmental impact assessment in Q1 2023. Based on available subsurface data, our current estimate for CO2 storage for these two sites alone are in the

| |
|---|
| multiple-gigaton range, so we are confident that this strategy will comfortably enable us to scale; however, if we did decide to operate our own concession we would need to apply for a exploration license with the Ministry of Energy, which would also necessitate an official Environmental Impact Assessment  from the National Environmental Management Agency. |

c. Is your solution potentially subject to regulation under any international legal regimes? If yes, please specify. Have you engaged with these regimes to date?

| |
|---|
| No |

d. In what areas are you uncertain about the legal or regulatory frameworks you'll need to comply with? This could include anything from local governance to international treaties. For some types of projects, we recognize that clear regulatory guidance may not yet exist.

| |
|---|
| Our regulatory uncertainty exists mainly in the medium-term when we plan to deploy new injection techniques that our team is developing, described in the confidential addendum. While a water dissolved approach fits within the existing regulatory framework, it is uncertain whether our new injection techniques would require new regulatory guidance and if so, what guidance that would entail. |

e. Do you intend to receive any tax credits during the proposed delivery window for Frontier's purchase?  If so, please explain how you will avoid double counting.

| |
|---|
| No |

## 9. Offer to Frontier

This table constitutes your **offer to Frontier**, and will form the basis of contract discussions if you are selected for purchase.

| | |
|---|---|
| **Proposed CDR** over the project lifetime (tonnes) *(should be net volume after taking into account the uncertainty discount proposed in 4(c))* | 2198 tons CO2 |
| **Delivery window** *(at what point should Frontier consider your contract complete? Should match 1(f))* | Q4 2024 |
| **Levelized Price** ($/metric tonne $CO_2$) *(This is the price per tonne of your offer to us for the tonnage described above)* | $227/tonne $CO_2$, |

# Application Supplement: Geologic Injection

**(Only fill out this supplement if it applies to you)**

## Feedstock and Use Case

1. What are you injecting? Gas? Supercritical gas? An aqueous solution? What compounds other than C exist in your injected material?

> For this project, we are co-injecting saline lake water and pure $CO_2$. The saline water contains Na, K, Ca, Mg, $HCO_3$, Cl, and minor amounts of $SO_4$.

2. Do you facilitate enhanced oil recovery (EOR), either in this project or elsewhere in your operations? If so, please briefly describe.

> No.

## Throughput and Monitoring

3. Describe the geologic setting to be used for your project. What is the trapping mechanism, and what infrastructure is required to facilitate carbon storage? How will you monitor that your durability matches what you described in Section 2 of the General Application?

> The geologic setting of our site comprises young (<1Ma) olivine basalts, pyroclastic deposits, and trachyte lavas (Allen and Darling, 1992). The trapping mechanism is geochemical. As acidic, $CO_2$-charged water reacts with minerals present in our target formation, fluid pH will rise and carbonate minerals will precipitate. The $CO_2$ will be kept at a partial pressure in co-injected water that is lower than the formation hydrostatic pressure, thus ensuring complete solubility trapping and ensuring $CO_2$ remains in a non-bouyant phase. While the water-dissolved method precludes the need for a structural cap rock (Sigfusson et al., 2016), impermeable cap rocks are present.
>
> The required infrastructure is outlined in our process flow diagram in the TEA spreadsheet. The infrastructure required is one injection well equipped with separate water and gas flow pipes, where the gas will be released into the water at depth for dissolution. A sampling pipe extending to the end of the well will allow for measurements to ensure complete dissolution (see Sigfusson et al., 2016). Water and gas will flow by gravity only. An additional well for monitoring will be installed.
>
> Fluid samples from the monitoring well will be continuously analyzed for major elements, pH, temperature, alkalinity+DIC, and electrical conductivity. Geochemical sampling of subsurface fluids will enable the verification of mineralization at depth, according to the procedures listed in Section 4 and the confidential addendum. Verification of mineralization will confirm the durability described in Section 2.

4. For projects in the United States, for which UIC well class is a permit being sought (e.g. Class II, Class VI, etc.)?

n/a

5. At what rate will you be injecting your feedstock?

We will begin injecting total feedstock at ~128 lpm (~6tons/CO2/day) to better constrain the site-specific reaction kinetics. We will stepwise increase this to our maximum capacity and monitor the reservoir's response to confirm no changes in permeability.

## Environmental Hazards

6. What are the potential environmental impacts associated with this injection project, what specific actions or innovations will you implement to mitigate those impacts? How will they be monitored moving forward?

Environmental impacts include minor disturbances to the land surface associated with construction of a water access pipe and small buildings for the project. As in-situ mineralization proceeds in the subsurface, we expect the land use change associated with site construction to be extremely minor. As such, the only potential impact is metal mobilization during chemical weathering reactions in the subsurface. These can be easily monitored with thorough and continuous analysis of monitoring fluids before and throughout the injection period. As our target formation is highly porous and permeable, we anticipate that physical damage to the subsurface environment is minimal, however this hazard will be assessed by monitoring the evolution of injectivity (see Section 4). We will also partake in geophysical monitoring that will proceed alongside the project inherent to the geothermal operation.

We also note that our process will mitigate environmental hazards of the geothermal operation. As we will source water from geothermal brine waste, this will prevent any contamination of surface water sources that has previously been a concern for geothermal operators.

7. What are the key uncertainties to using and scaling this injection method?

The main uncertainty of any mineralization project pertains to inducing the precipitation of secondary minerals that may reduce permeability and porosity over time, such as clay minerals. However, as the injectate is acidic (pH ~3), we don't anticipate any clogging to occur at or near the injection site, as the acidic fluids will encourage dissolution of primary minerals. While mineralization will occur some distance from the injection site, permeability evolution must be monitored. As has been demonstrated in natural basaltic systems (e.g., Neuhoff et al., 1999) secondary porosity can evolve due to the volume differences between primary (low volume, high density) and secondary (high volume, low density) minerals, where alteration may produce permeability-enhancing fractures (Kelemen and Hirth, 2012).

In addition, mineralization techniques are likely site-specific. Through our tracer injections, we will greatly improve our understanding of the target formation and subsurface hydrology. Until then, one uncertainty pertains to the complete site design at scale (e.g., number of injection wells, distance between them, monitoring well locations, etc). As we are committed to delivering the highest-quality

MRV, it is our priority to design the scaled site such that our sampling fluid geochemistry is reflective of post-injection conditions from the entire operation, without requiring the need for excess monitoring wells.