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Carbon Sequestration, Inc.

APPLICATION FOR STRIPE 2020 NEGATIVE EMISSIONS PURCHASE

Section 1: Project Info and Core Approach

1. Project name

Carbon Sequestration, Inc.

2. Project description. ***Max 10 words***

Carbon sequestration via logging and wood burial

3. Please describe your negative emissions solution in detail, making sure to cover the following points:
   a) Provide a technical explanation of the project, including demonstrations of success so far (preferably including data), and future development plans. Try to be as specific as possible: all relevant site locations (e.g. geographic regions), scale, timeline, etc. Feel free to include figures/diagrams if helpful. Be sure to discuss your key assumptions and constraints.
   b) If your primary role is to enable other underlying project(s) (e.g. you are a project coordinator or monitoring service), describe both the core underlying technology/approach with project-specific details (site locations, scale, timeline, etc.), and describe the function provided by your company/organization with respect to the underlying technology/approach.
   c) Please include or link to supplemental data and relevant references.

Max 1,500 words *(feel free to include figures)*

Carbon Sequestration, Inc. is the first commercial climate solution project to utilize the groundbreaking methodology developed by Dr. Ning Zeng from the University of Maryland - College Park. Dr. Zeng's methodology, known as carbon sequestration via wood burial, has the potential to be the cheapest and most efficient process of carbon sequestration in the market.

Our application of carbon sequestration via wood takes advantage of cheap 'slash,' which is the organic, unused material left over as a result of tree cutting forestry operations. After clear-cutting, an average of five to fifteen (5 - 15) green tons per acre of slash is left as residual forest waste. Ten green tons of wood product converts to approximately 9 tons of sequestered CO2. Dr. Zeng's methodology gives us an opportunity to utilize America's Gulf Coast forests as a carbon-sucking asset. Focusing on local relationships in East Texas and Western Louisiana, we have entered into an agreement with American Forest Management (AFM) in order to access unused timber waste. Partnering with the biggest forest management group in the country, grants us access to over one hundred thousand (100,000) tons of slash to sequester annually, with the potential to scale much larger. We have partnered with Kingham Dalton Wilson, Ltd. (KDW), a reputable construction and architecture firm with a large operating presence in East Texas, to design pit construction

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templates that vary in size, but are geologically secure in order to prevent the release of carbon dioxide.

The security of our sequestration pits is critical to the success of our methodology. In order to efficiently sequester tons of carbon dioxide through the burial of unused slash, we must ensure that our pit is able to maintain strength and security as a long-term solution. We have several scientists and engineers, including Dr. Zeng, on our team to assist us in navigating these challenges. Although we have operated on the assumption that our sequestration pits will be a long-term climate solution, we have also proactively integrated appropriate measures to monitor the release of greenhouse gases from the pit, including through EPA Form RR.

Our operations are located within a one hundred mile (100 mile) radius of Lufkin, Texas, which includes the Davy Crockett, Angelina and Sabine National Forests. Through our partnership with AFM, we have access to at least two possible locations. Our timeline anticipates pit construction and sequestration to begin in July, 2020, with 64,215 net tons of qualified carbon, after the carbon life cycle analysis, to be sequestered by December, 2020.

More detail is attached as a slide deck that we prepared for Stripe including our specific timeline, common concerns, pit designs, and additional information.

Section 2: 2020 Net-Negative Sequestration Volume

See Stripe Purchase Criteria 1: The project has volume available for purchase in 2020.

4. Based on the above, please estimate the **total net-negative sequestration volume** of your project (and/or the underlying technology) in 2020, in tons of CO2. (Note: We're looking for the net negative amount sequestered here, net lifecycle emissions. In Section 3; you'll discuss your lifecycle and why this number is what it is).

64,215 tCO2 - See Exhibit A

5. Please estimate how many of those tons are still available for purchase in 2020 (i.e. how many tons not yet committed). This may or may not be the same as the number above.

64,215 tCO2

6. (Optional) Provide any other detail or explanation on the above numbers if it'd be helpful. ***Max 100 words.***

Designed by construction firm KDW, our "mega pit," holds 71,019 tons of qualified carbon oxide, with a net of 64,215 tons after accounting for possible leakage and project emissions. The construction plans for this pit can be found in our Stripe presentation.

Section 3: Life Cycle Analysis

See Stripe Purchase Criteria 2: The project has a carbon negative complete lifecycle (including energy use, etc).

7. Provide a life cycle analysis of your negative emissions solution demonstrating its carbon negativity, as complete as possible given limited space, and making sure to cover the following points:
   a) Include a flow sheet diagram of direct ingoing and outgoing flows (GHG, energy, materials, etc) that bear on the LCA.
   b) Please be explicit about the boundary conditions of your LCA, and implications of those boundaries on your life cycle. Let us know why the conditions you've set are appropriate to analyze your project.

c) Make sure to identify assumptions, limitations, constraints, or factors that relate to ingoing and outgoing flows, citing values and sources (for example: land and resource scarcity, limitations on a required chemical, energy requirements). Also identify key sources of uncertainty in determining these values.
d) If your solution results in non-CO2 GHG emissions, please be sure to separately specify that (e.g. in units of GWP 20 or 100 years, ideally both).
e) For solutions that rely on modular components (for example: incoming energy flows or outgoing CO2 streams), feel free to cite values associated with those interfaces instead of fully explaining those components. For these values, please identify the upstream and downstream life cycle emissions of the component.
f) Explain how you would approach a more comprehensive LCA by citing references and underlying data needed for the analysis.

***Max 1,000 words** (feel free to include figures or link to an external PDF)*

See Exhibit A and Exhibit B.

The life cycle analysis will be streamlined by volumetrics independent verification, monitoring and measurement via proprietary mobile technology (Delta Perform), with reporting and methodology support by Professor Zeng and his colleagues.

8. Based on the above, for your project, what is the ratio of emissions produced as any part of your project life cycle to CO2 removal from the atmosphere? For true negative emissions solutions, we'd expect this ratio to be less than 1.

$\frac{(71019-64215)}{71019}$ = 0.09580535

Section 4: Permanence and Durability

See Stripe Purchase Criteria 3: The project provides durable, long-term storage of carbon.

9. Provide an upper and lower bound on the likely durability / permanence of sequestered carbon provided by your project, in years:

High end - 99% of sequestered carbon stable at year 100

Low end - 88% of sequestered carbon stable at year 100

10. Please provide a justification for your estimates, and describe sources of uncertainty related to: the form of storage, effects of environmental or climatic variability, difficulty in monitoring or quantification, etc. Specifically, discuss the risks to permanence for your project, the estimated severity/frequency of those risks (e.g. 10% of the acres of forest in this forest type are burned by fire over a 100 year period), and the time-horizon of permanence given those risks.

Max 500 words

See Exhibit A

We have no reason to believe that climate change will negatively impact the productivity of the East Texas and West Louisiana timberlands. We will actively monitor and measure any GHG emissions from the pit per EPA regulations for geologically stable CCS projects. Because we are dealing with solid carbon, as opposed to carbon oxide gas, analysis of the timing and science of decomposition of the buried biomass will be one of our primary focuses. In any case, we plan to mitigate carbon oxide and methane emissions with the installation of a gas collection system which will utilize a network of underground pipes which will collect any resulting emissions for disposal at the surface.

Section 5: Verification and Accounting

See Stripe Purchase Criteria 4: The project uses scientifically rigorous and transparent methods to verify that they're storing the carbon that they claim, over the period of time they claim to.

11. Provide detailed plans for how you will measure, report, and verify the negative emissions you are offering. Describe key sources of uncertainty associated with your monitoring, and how you plan to overcome them.
Max 500 words

We will implement a monitoring and measurement system via mobile app, identification, and categorization of biomass through moisture content and volumetric analysis and/or use of a traditional scale at the pit. **See Exhibit D - Lifetime of Buried Wood**.

12. Explain your precise claim to ownership of the negative emissions that you are offering. In particular, explain your ownership claim: 1) in cases in which your solution indirectly enables the direct negative emissions technology and 2) when, based on the LCA above, your solution relies on an additional upstream or downstream activity before resulting in negative emissions. Please address the notion of "double counting" if applicable to your project, and how you'll prevent it.
Max 200 words

The land underlying the pit will be owned in fee by the Company. Carbon Credits will be owned by limited partners in a Limited Partnership. Limited Partners credit owners have no liability for project liabilities.

Section 6: Potential Risks

This section aims to capture Stripe Purchase Criteria 5: The project is globally responsible, considering possible risks and negative externalities.

13. Describe any risks or externalities, any uncertainties associated with them, and how you plan to mitigate them. Consider economic externalities, regulatory constraints, environmental risk, social and political risk. For example: does your project rely on a banned or regulated chemical/process/product? What's the social attitude towards your project in the region(s) it's deployed, and what's the risk of negative public opinion or regulatory reaction?
Max 300 words

Some of the potential risks with this project from the pit are 1) there is greater than expected pit emissions of greenhouse gases, which pose a risk of reversal of credits, 2) the carbon market as an externality (i.e., double counting, applying/qualifying for credits, verification process (MMMRV), government approval - political risk), 3) execution problems, including availability of machinery and forestry expertise, 4) potential high energy and other input costs, 5) political and regulatory opposition, 6) the possible collapse in carbon pricing, 7) future technological breakthroughs in competing carbon technologies, and 8) inability to secure sufficient slash at low prices.

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Section 7: Potential to Scale

This section aims to capture Stripe Purchase Criteria 6: The project has the potential to scale to high net-negative volume and low cost (subject to the other criteria).

14. Help us understand how the cost and net-negative volume of your solution will change over time. Note that we aren't looking for perfect estimates. Instead, we're trying to understand what the long-term potential is and what the general cost curve to get there looks like. (Note: by "cost" here we mean the amount Stripe or any other customer would pay for your solution):

	Today	In ~5 years	In ~20 years
Est. Cost per net-negative ton (in $)	$42.50	$40.00	$30.00
Est. Net-negative volume (in tons of CO_2)	50,000	350,000	2,500,000

15. What are the drivers of cost? Which aspects of your costs could come down over the next 5 years, and by how much? Do you think your eventual scale potential is limited by cost or by volume? Why? Refer to any relevant constraints from question #7, like land or materials scarcity, and specify the boundary conditions for which you consider those constraints.

Max 300 words

Currently, our cost per net-negative ton of sequestered qualified carbon sits at $42.50. This price is driven by 2) chipping of slash ($10.00 per ton), 2) transportation of slash to sequestration pit ($5.00 per ton), 3) purchase of unused slash on nearby land controlled by American Forest Management ($5.00 per ton), 4) construction of the sequestration pit ($10.50 per ton), 5) methodology verification ($12.00 per ton), and other administration costs. Although most of these costs are associated with the sequestration and will remain unchanged, methodology approval, independent verification and land acquisition are one-time, fixed costs that will decrease as our operations expand. In two years, we expect our methodology to be approved. We will retain responsibility for the annual cost and effort of monitoring and verifying the stability and volumes of the sequestration sites.

Section 8: Only for projects with significant land usage

See Stripe's Purchase Criteria 2: The project has a net cooling effect on the climate (e.g. carbon negative complete life cycle, albedo impact, etc.) ***This section is only for projects with significant land usage requirements: Forest, Soil, and BECCS/Biochar/Biomass sequestration projects.***

16. Location: Please provide baseline information about the geographic location(s) of your project; and link shapefile(s) of project area(s).

Max 100 words

Our geographic focus is East Texas, with locations dependent upon availability of slash and other timber residue within a one hundred mile (100 mile) radius from Lufkin, Texas. Through our partnership with the American Forestry Management (AFM), we have identified two potential locations to access available slash in 2020.

17. Land ownership: Please describe the current (and historical as relevant) land ownership and management for the area(s) provided in (16). If your project is not the landowner, describe your relationship to the landowner.
Max 150 words

The real property underlying the pit will be owned in fee by Carbon Sequestration, Inc.

18. Land use: For forest projects, please provide details on forest composition as well as forest age and basal crop area/density. For soil projects, please provide details on land use and crop type (if agricultural), soil organic carbon baselines, and regenerative methodology. For BECCS, biochar, or wooden building materials projects, please provide details on biomass crop type and methodology as applicable.
Max 500 words

The tree/wood products will primarily come from loblolly pine (*pinus taeda*). Heavily compacted and fine particle clays are required for the pit site. Geoclime, LLC, a provider of geological soil analysis, will be responsible for soil sampling and pit design.

19. Net effect on climate: Please discuss the non-CO2 impacts of your project that may not be covered in your LCA, such as your impact on albedo.
Max 150 words

As shown in Exhibit C, assuming we can access 50% of the available East Texas and West Louisiana market, annual tonnage is scalable to 18% of all green tonnage harvested, or approximately 3,521,814 tCO2. Basic scalability from the existing timber industry as shown on Exhibit C is 18,876,512 tCO2 annually, equal to offsetting the carbon footprint of 1,179,782 Americans annually. We believe the lowest hanging fruit is in utilizing the existing timber industry to sequester carbon. This does not include active forest management and our involvement in the Trillion Trees initiative, which we are collaborating with congressional members. Additionally, our efforts will increase awareness and ownership of negative emissions in areas that have been traditionally skeptical of the idea.

Section 9: Other

20. What one thing would allow you to supercharge your project's progress? This could be anything (offtakes/guaranteed annual demand, policy, press, etc.).
Max 100 words

Increasing annual commitment with negative emissions contracts/market, available to Stripe and other partners.

21. (Optional) Is there anything else we should know about your project?
Max 500 words

N/A

Section 10: Submission details

*This section **will not** be made public.*

22. Please insert below the name and title of the person submitting this application on behalf of your company (or, if you are submitting this application on your own behalf, your own details). By submitting this application, you confirm that you have read and accept the Project Overview (available HERE), as well as the further conditions set out below. As a reminder, all submitted applications will be made public upon Stripe's announcement. *Once you've read and completed this section, submit your application by March 20th by clicking the blue "Share" button in the upper right, and share the document with* ***nets-review-2020@stripe.com****.*

Name of company or person submitting this application

[redacted]

Name and title of person submitting this application (may be same as above)

[redacted]

Date on which application is submitted

[redacted]

We intend to make the selection process as informal as possible. However, we do expect that (a) the content of your application is, to the best of your knowledge, complete and correct; (b) you do not include any content in your application that breaches any third party's rights, or discloses any third party's confidential information; (c) you understand that we will publicly publish your application, in full, at the conclusion of the selection process. You also understand that Stripe is not obliged to explain how it decided to fund the projects that are ultimately funded, and - although extremely unlikely - it is possible that Stripe may decide to not proceed, or only partially proceed, with the negative emissions purchase project. Finally, if you are selected as a recipient for funding, Stripe will not be under any obligation to provide you with funding until such time as you and Stripe sign a formal written agreement containing the funding commitment.

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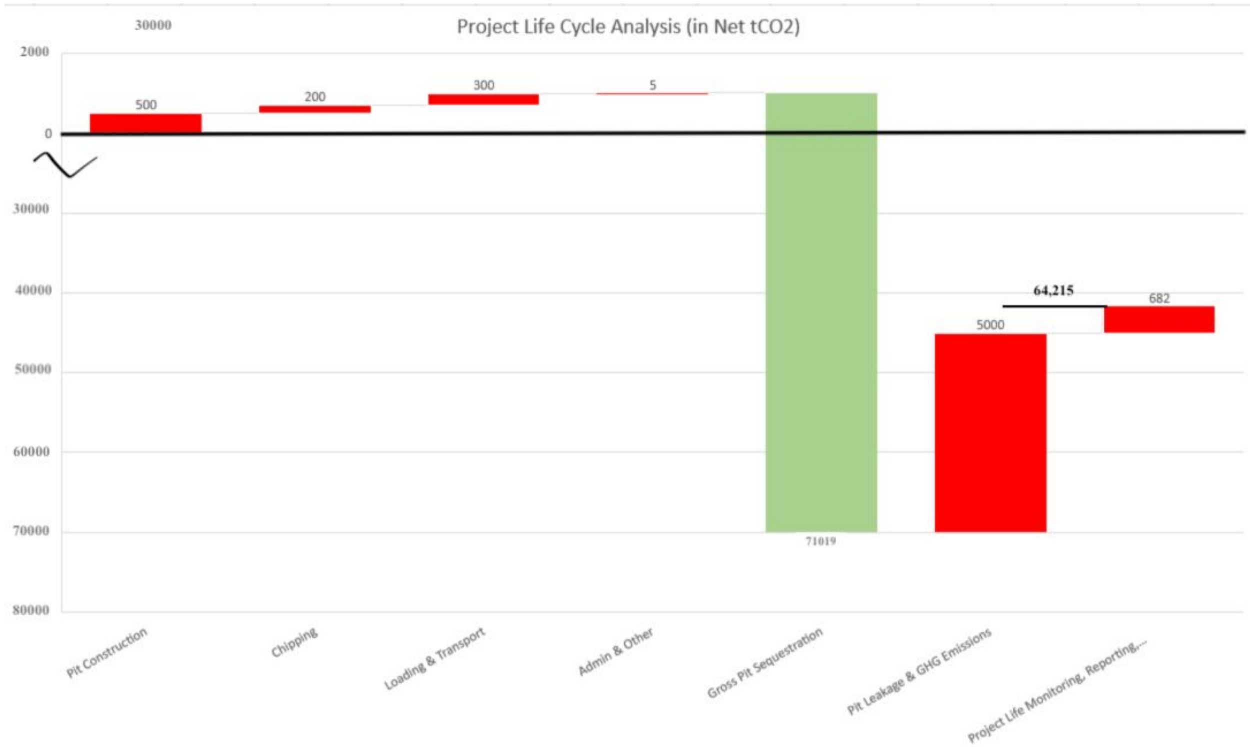
EXHIBIT A: LIFE CYCLE ANALYSIS

Cost of Carbon Sequestration		**Calculation date: 2020-3-16**			
Inputs, marginal cost, undiscounted				**Calculations**	**Parameter**
Value	**Parameter**			3,600,000	Pit volume, cubic feet
0.38	Wood chip density, dry		**Pit Measurements**	133,333	Pit volume, cubic yards
0.5	Carbon fraction of wood			101,941	Pit volume, cubic meters
3.666666667	Ratio, CO2:carbon			38,737	Wood chips, metric tons/pit, dry weight
3.28084	Feet per meter			71,019	tCO2/pit, gross
22.23	Lbs CO2/gal diesel			65,337	tCO2/pit, 100year net storage
2204.62	Lbs/metric ton			952	Truckloads of chips/pit
31.5	Chips, cubic feet/green ton			3,175	Trucking fuel, gallons/pit
			Summary of Life Cycle	33,333	Excavator fuel, gallons/pit (may count only digging, not covering)
$ -	Stumpage price, $/green tons		**Analysis**	20,000	Loader fuel, gallons/pit
140	Truck volume, for chips, cubic feetyards, 53' trailer			50,000	Chipper fuel, gallons/pit
20	Truck miles per load, round trip			8,000	Chip spreading fuel, gallons/pit
$1.50	Truck cost per mile, dollars			111,333	Total fuel, gallons/pit
$120	Chipper cost per hour			1,123	Total fuel emissions, tCO2/pit
40	Chipper cu yds produced/hour			**64,215**	**Net sequestration, tCO2/pit, net of fuel emissions**
$120	Loader cost per hour				
40	Loader volume per hour				
400	Pit burial area length, feet				
450	Pit burial area width, feet				
40	Excavator cu yds/hr, undisturbed volume				
$90	Chip spreading/compacting, $/hour				
100	Chip spreading/compacting cubic yards/hour				
$180,000	Pit cost, permitting and construction				
$110,000	Pit closure				
$150,000	Pit 15 years maintenance				
$50,000	Pit initial verification				
$60,000	Pit verification, years 5 and 10, total				
$40,000	Pit stabilization verification, year 15				
0.92	Fraction of carbon remaining stored for 100 years				
6	Loader, fuel gal/hr				
15	Chipper fuel gal/hr				
6	Truck miles per gallon				
6	Chip spreading, fuel, gal/yr				
10	Excavator fuel gal/hr				
Fixed Costs, one time					
$120,000	Methodology development				
$60,000	Methodology validation				

EXHIBIT B: LIFE CYCLE ANALYSIS GRAPH



July 2020	Aug 2020	Sept 2020	Nov 2020	Dec 2020	2021	-	2121

EXHIBIT C: SCALABILITY OF SLASH

Table 6B � Volume of roundwood products by species group, State and ownership group, [CSI - TX/LA Timber Report]

Species Group and State	Total	National Forest	Other Public	Forest Industry	Nonindustrial Private
			green tons		
Softwoods					
Louisiana	20,286,780	382,644	426,655	9,536,065	9,941,417
Texas	12,798,249	0	408,427	7,258,482	5,131,340
Total softwoods	33,085,030	382,644	835,082	16,794,547	15,072,757
Hardwoods					
Louisiana	2,571,876	36,706	73,060	1,320,413	1,141,697
Texas	3,474,370	0	124,105	1,524,654	1,825,612
Total hardwoods	6,046,246	36,706	197,165	2,845,067	2,967,308
All species	39,131,275	419,349	1,032,247	19,639,614	18,040,065

Numbers in rows and columns may not add to totals due to rounding.

Table 6B � Volume of roundwood products by species group, State and ownership group, [CSI - US Timber Report]

Species Group and State	Total	National Forest	Other Public	Forest Industry	Nonindustrial Private
			green tons		
Softwoods					
Alabama	29,855,138	90,264	670,625	23,085,996	6,008,253
Arkansas	13,958,576	367,804	105,340	6,361,708	7,123,724
Florida	17,020,147	229,851	1,244,145	13,427,341	2,118,810
Georgia	40,251,883	65,821	743,889	32,315,123	7,127,051
Kentucky	678,170	547	4,691	671,983	949
Louisiana	20,286,780	382,644	426,655	9,536,065	9,941,417
Mississippi	24,054,040	555,960	894,646	17,284,962	5,318,472
North Carolina	16,620,705	18,091	871,825	11,965,276	3,765,513
Oklahoma	2,699,128	35,598	16,451	1,637,924	1,009,155
South Carolina	23,146,457	420,100	567,130	20,367,921	1,791,305
Tennessee	2,077,362	0	42,624	1,921,062	113,675
Texas	12,798,249	0	408,427	7,258,482	5,131,340
Virginia	10,637,641	19,185	286,303	9,996,765	335,389
Total softwoods	214,084,276	2,185,864	6,282,752	155,830,607	49,785,053
Hardwoods					
Alabama	8,729,679	49,318	184,753	6,701,506	1,794,102
Arkansas	4,928,816	134,781	48,366	2,635,678	2,109,990
Florida	1,267,987	34,638	142,294	949,065	141,990
Georgia	7,015,516	14,734	161,419	5,732,517	1,106,846
Kentucky	5,546,326	23,323	91,674	5,413,924	17,405
Louisiana	2,571,876	36,706	73,060	1,320,413	1,141,697
Mississippi	6,376,682	231,660	206,989	4,766,948	1,171,084
North Carolina	7,065,255	3,981	260,176	5,750,529	1,050,569
Oklahoma	583,111	5,935	2,742	406,198	168,236
South Carolina	3,902,203	66,763	98,478	3,431,582	305,380
Tennessee	6,568,319	0	113,567	6,167,043	287,709
Texas	3,474,370	0	124,105	1,524,654	1,825,612
Virginia	7,537,619	68,590	168,775	7,017,127	263,127
Total hardwoods	65,567,758	690,429	1,676,399	51,817,184	11,383,746
All species	279,652,034	2,876,294	7,959,151	207,647,791	61,168,799

Numbers in rows and columns may not add to totals due to rounding.

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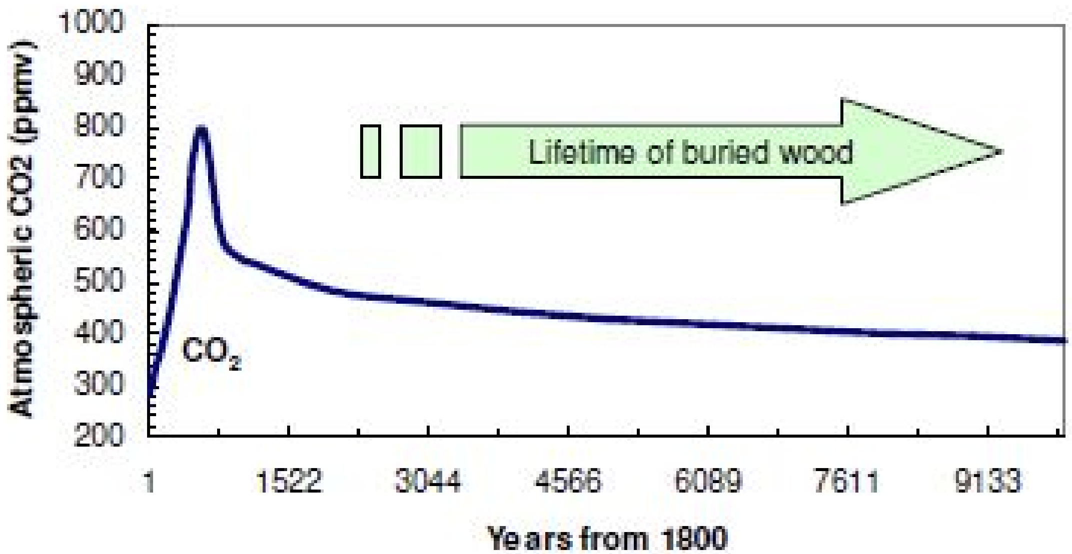
EXHIBIT D: LIFETIME OF BURIED WOOD



Graph derived from Dr. Ning Zeng's [Carbon Sequestration via Wood Burial.](#)
For reference, also see articles on examples of the lifetime of buried wood in [Venice](#) and [Boston.](#)