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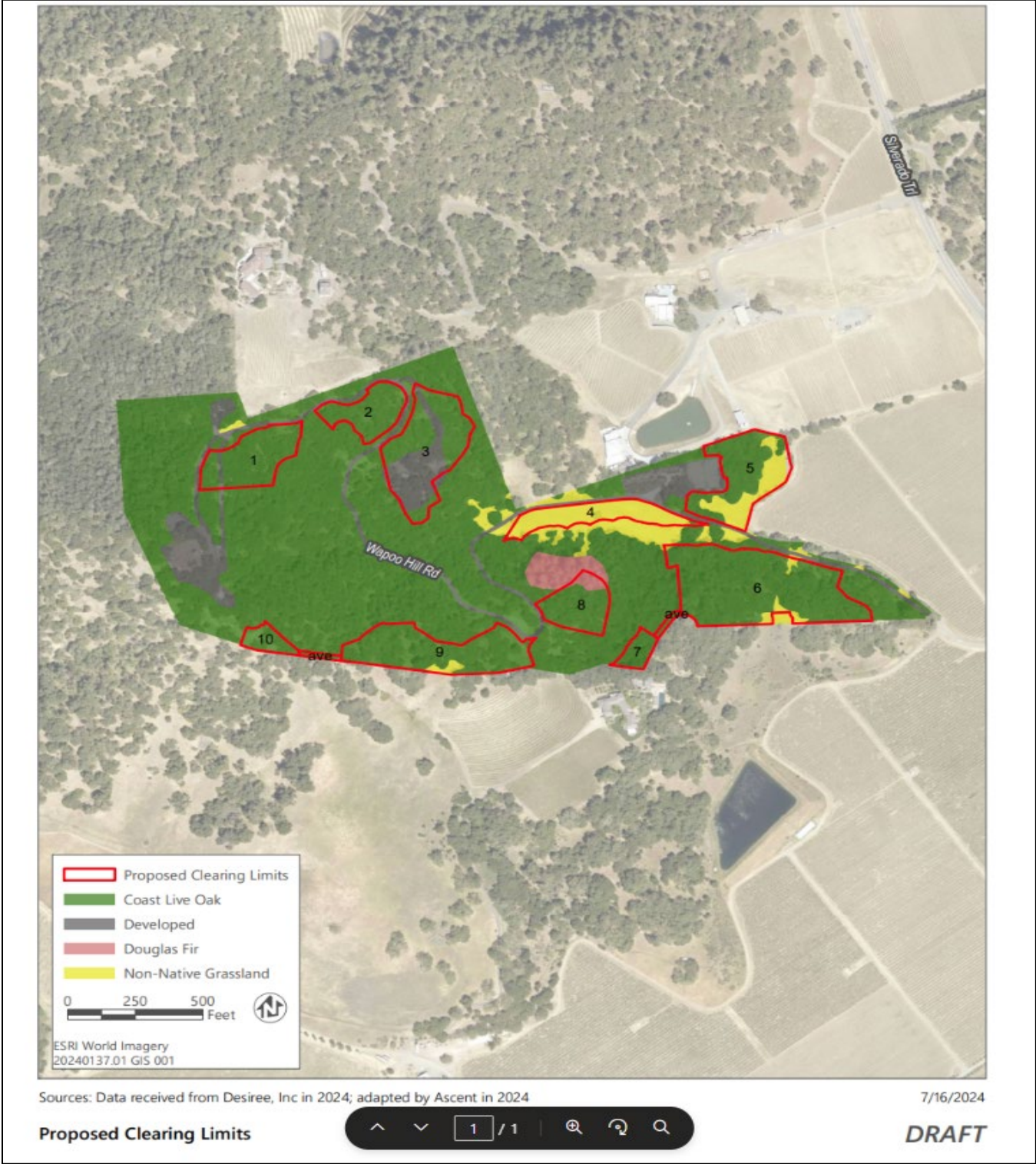
From: Brenda Hom and Dimitri Antoniou (Ascent)

Subject: Final Boisset Vineyard Greenhouse Gas Analysis

INTRODUCTION AND PURPOSE

Boisset Collection LLC (applicant) proposes to develop a 13.1-acre vineyard located at 5681 Silverado Trail in unincorporated Napa County (project). During this process, existing onsite vegetation would be removed, including trees, predominantly coast live oaks, and ground cover comprising native plants, weeds, and non-native grasslands (WRA 2023). All felled trees and woody mass would be converted to biochar (either onsite with portable units or offsite) to ensure that stored carbon is not released into the atmosphere. This would be followed by ripping and disking, installation of trellis and irrigation, erosion control and winterization measures, and planting grapevines. Work is anticipated to begin in April 2026 and be completed in October 2026. Figure 1 below provides a map of the proposed clearing limits. The vineyard would obtain Napa Green Vineyard certification and would be farmed using sustainable hand farming viticultural practices, and the grapes harvested from the cultivated bespoke 1 meter by 1 meter vineyards would be used to produce an ultra-premium cabernet-based wine (Desiree, Inc. 2025). In addition to obtaining Napa Green Vineyard certification, the project proposes to include one electric vehicle (EV) charger onsite, to support passenger vehicle charging and farm equipment charging, and any onsite farm equipment would either use renewable fuels or be electric (Desiree, Inc. 2025).

This study quantifies the net change in greenhouse gas (GHG) emissions from project implementation. This quantification includes the effects of activities that increase (e.g., construction vehicle fuel consumption, the loss of trees and grasslands and their associated carbon sequestration potential) and decrease (e.g., carbon sequestration from the growth of vineyards) the amount of GHG in the atmosphere. Considering that removed woody mass would be converted to biochar, this analysis assumes no net loss in current carbon stock from onsite woody mass. Detailed calculations are provided in Appendix A of this document.



Source: Data received from Desiree, Inc in 2024; adapted by Ascent in 2024.

Figure 1 Proposed Clearing Limits for Boisset Vineyard

REGULATORY CONTEXT

CALIFORNIA AIR RESOURCES BOARD

On April 29, 2015, Executive Order (EO) B-30-15 established a California GHG reduction target of 40 percent below 1990 levels by 2030. Senate Bill (SB) 32 of 2016 amended the Health and Safety Code to include Section 38566, which contains language to authorize the California Air Resources Board (CARB) to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030. Approved on September 16, 2022, Assembly Bill (AB) 1279, The California Climate Crisis Act, declares the policy of the state to achieve net zero GHG emissions as soon as possible, but no later than 2045, and achieve and maintain net negative GHG emissions thereafter, and to ensure that by 2045, statewide anthropogenic GHG emissions are reduced to at least 85 percent below the 1990 levels. AB 1279 also requires CARB to ensure that the State's Climate Change Scoping Plan (Scoping Plan) identifies and recommends measures to achieve carbon neutrality and to identify and implement policies and strategies for carbon dioxide (CO₂) removal solutions and carbon capture, utilization, and storage technologies.

CARB is required to prepare and regularly update the Scoping Plan showing how state GHG reduction targets would be met. In response to AB 1279, CARB adopted the 2022 Scoping Plan to Achieve Carbon Neutrality (2022 Scoping Plan). This is the most current version of the Scoping Plan (CARB 2022) and outlines a strategy to achieve AB 1279's GHG reduction targets. The 2022 Scoping Plan outlines the strategies that the state will implement to achieve carbon neutrality by reducing GHG emissions to meet the anthropogenic target and by expanding actions to capture and store carbon through the state's natural and working lands and using a variety of mechanical approaches. Some of the primary actionable strategies relating to local development include an overall emphasis on increasing cropland, grassland, and forest preservation and conservation, increased use of organic agriculture practices, increased adoption of compost production and application to improve carbon storage, and increases in infrastructure and practices to promote alternatives to agriculture waste burning to increase long-term carbon storage (e.g., biomass energy generation).

The major element of the 2022 Scoping Plan is the decarbonization of every sector of the economy, including rapidly moving to zero-emission transportation. The 2022 Scoping Plan, in Appendix D Local Actions, recommends a number of project-design features that land use development projects could incorporate to demonstrate consistency with the overarching objectives of the plan. Namely, these actions pertain to building decarbonization and electrification of the on road transportation network. Several air districts in California have developed CEQA guidelines based on these principles, explained below.

BAY AREA AIR DISTRICT

The Bay Area Air District (District) adopted its 2022 CEQA Guidelines, which updated and superseded the District's prior 2017 CEQA Guidelines (Bay Area Air District 2022). The District's 2022 CEQA Guidelines provide recommended procedures for evaluating air quality and climate impacts in CEQA documents. The 2022 CEQA Guidelines recommend GHG thresholds of significance for land use plans and projects, which rely primarily on building electrification (e.g., no natural gas), electric vehicle infrastructure above current requirements, and vehicle miles traveled (VMT) efficiency. However, these guidelines do not include recommended GHG thresholds of significance directly relevant to this type of proposed project (i.e., vineyard development). Further, the District has not developed a quantitative significance threshold for construction-related GHG emissions because construction emissions are temporary and variable. However, the District recommends that the lead agency quantify and disclose GHG emissions during construction. Even though the significance of construction-related GHG emissions is not determined, to minimize GHG emissions and emissions of other air quality pollutants, the District recommends that projects should

incorporate the following best management practices for reducing GHG emissions (Table 6-1 in the 2022 CEQA Guidelines) (Bay Area Air District 2022):

- ▶ Use zero-emission and hybrid-powered equipment to the greatest extent possible, particularly if emissions occur near sensitive receptors or within the Bay Area Air District-designated Community Air Risk Evaluation (CARE) area or AB 617 community.
- ▶ Require all diesel-fueled off-road construction equipment to be equipped with US Environmental Protection Agency (EPA) Tier 4 Final compliant engines or better as a condition of the bid contract.
- ▶ Require all on-road heavy-duty trucks to be zero emissions or meet the most stringent emissions standard, such as model year 2024 to 2026, as a condition of the bid contract.
- ▶ Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 2 minutes (a 5-minute limit is required by the state airborne toxics control measure [Title 13, Sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site and develop an enforceable mechanism to monitor idling time to ensure compliance with this measure.
- ▶ Prohibit off-road diesel-powered equipment from being in the “on” position for more than 10 hours per day.
- ▶ Use CARB-approved renewable diesel fuel in off-road construction equipment and on-road trucks.
- ▶ Use EPA SmartWay-certified trucks for deliveries and equipment transport.
- ▶ Require all construction equipment to be maintained and properly tuned in accordance with the manufacturer’s specifications. Equipment should be checked by a certified mechanic and determined to be running in proper condition prior to operation.
- ▶ Where grid power is available, prohibit portable diesel engines and provide electrical hookups for electric construction tools, such as saws, drills, and compressors, and use electric tools whenever feasible.
- ▶ Where grid power is unavailable, use alternative fuels, such as propane or solar electrical power, for generators at construction sites.
- ▶ Encourage and provide carpools, shuttle vans, transit passes, and/or secure bicycle parking to construction workers and offer meal options onsite or shuttles to nearby meal destinations for construction employees.
- ▶ Reduce electricity use in the construction office by using LED bulbs, powering off computers every day, and replacing heating and cooling units with more efficient ones.
- ▶ Minimize energy used during site preparation by deconstructing existing structures to the greatest extent feasible.
- ▶ Recycle or salvage nonhazardous construction and demolition debris, with a goal of recycling at least 15 percent more by weight than the diversion requirement in Title 24.
- ▶ Use locally sourced or recycled materials for construction materials (goal of at least 20 percent based on costs for building materials and based on volume for roadway, parking lot, sidewalk, and curb materials). Wood products used should be certified through a sustainable forestry program.
- ▶ Use low-carbon concrete, minimize the amount of concrete used, and produce concrete on-site if it is more efficient and lower-emitting than transporting ready-mix.
- ▶ Develop a plan to efficiently use water for adequate dust control because substantial amounts of energy can be consumed during the pumping of water. Include all requirements in applicable bid documents, purchase orders, and contracts, with successful contractors demonstrating the ability to supply the compliant on- or off-road construction equipment for use prior to any ground-disturbing and construction activities.

SACRAMENTO METROPOLITAN AIR QUALITY MANAGEMENT DISTRICT

In addition to guidance provided by the Bay Area Air District, the Sacramento Metropolitan Air Quality Management District (SMAQMD) has also developed guidance pertaining to the evaluation of GHG emissions for projects located within the Sacramento-Metropolitan area. In February 2021, SMAQMD updated Chapter 6 of the Guide to Air Quality Assessment in Sacramento County to include thresholds of significance for GHG emissions (SMAQMD 2021).

SMAQMD recommends methods for analyzing project-generated GHGs in CEQA analyses and offers multiple potential GHG reduction measures for land use development projects. SMAQMD developed thresholds of significance to provide a uniform scale to measure the significance of GHG emissions from land use and stationary source projects in compliance with CEQA to align with the statewide GHG target of 40 percent below 1990 levels by 2030, with the passage of SB 32 for land use development projects (SMAQMD 2021). While the project is not located in the Sacramento area, SMAQMD's guidance provides additional numerical GHG emissions levels that could apply to other projects outside of the SMAQMD's jurisdiction, given that GHG emissions are a global concern. SMAQMD recommends that a 1,100 metric tons of carbon dioxide equivalent (MTCO₂e) emissions level be applied as a bright-line threshold of significance for evaluating construction emissions of GHGs. SMAQMD also recommends a tiered approach to evaluating the significance of operational emissions (similar to the Bay Area Air District). All projects are required to implement the following tier 1 best management practices (BMP):

- ▶ BMP 1 – Projects shall be designed and constructed without natural gas infrastructure.
- ▶ BMP 2 – Projects shall meet the current CalGreen Tier 2 standards, except all-electric vehicle capable spaces shall instead be electric vehicle ready.

Further, when projects meet the above design features, operational emissions can be screened out using an annual emission level of 1,100 MTCO₂e.

While SMAQMD's guidance was developed in consideration of near-term statewide GHG reduction goals (i.e., a 40 percent reduction from the 1990 statewide inventory by 2030), SMAQMD's recommended BMPs are reflective of the Bay Area Air District's thresholds for determining significance in its 2022 CEQA Air Quality Guidelines. As stated in its Justification Report, BAAQMD's thresholds were designed to ensure that local governments do their "fair share" to contribute to the statewide goal of achieving carbon neutrality by 2045, as codified in AB 1279 (BAAQMD 2022). Moreover, SMAQMD's tier 1 and tier 2 BMPs are similar to the direction provided in Appendix D, "Local Actions," of the 2022 Scoping Plan which identifies building decarbonization, VMT reductions, and the electrification of the mobile source sector as key priority areas that local jurisdictions can target to do their "fair share" in assisting the state in meeting its long-term goal of carbon neutrality by 2045 (CARB 2022).

Because SMAQMD's tier 1 and tier 2 BMPs would result in building decarbonization, VMT reductions, and the infrastructure to support EVs, they are considered appropriate thresholds for projects outside of the Sacramento region. In addition, Napa County, as the CEQA Lead Agency recommended the consideration of SMAQMD's adopted GHG thresholds and guidance for this assessment.

NAPA COUNTY

Napa County is developing, and as of August 1, 2025, released the public draft Regional Climate Action and Adaptation Plan (RCAAP), which will serve as a regional roadmap for reducing GHG emissions and adapting to climate change. The RCAAP is a regional effort including six jurisdictions: the County of Napa, the City of American Canyon, the City of Calistoga, the City of Napa, the City of St. Helena, and the Town of Yountville.

The RCAAP includes a baseline GHG emissions inventory, GHG emissions forecasts for future years (i.e., 2030, 2035, 2045), and establishes GHG reduction targets consistent with goals outlined in the 2022 CARB Scoping Plan, as follows:

- ▶ 42 percent reduction below 2019 levels by 2030,
- ▶ 57 percent reduction below 2019 levels by 2035,
- ▶ 85 percent reduction below 2019 levels by 2045, and
- ▶ Carbon neutrality by 2045.

Further, the RCAAP includes a policy framework, including 46 strategies with associated measures and actions, across major GHG emissions sectors, designed to achieve GHG reduction targets. While the RCAAP is currently still in draft form and therefore cannot be relied upon under CEQA for project-level analyses, the policy framework presented in the RCAAP is still relevant to the project (Napa County 2025). The following strategies would, if adopted as currently drafted, apply directly to vineyard projects:

- ▶ BE-4 Increase Sustainable Winery Certification
- ▶ TR-3 Expand Electric Vehicle Charging Infrastructure
- ▶ SW-2 Reduce Construction and Demolition Waste
- ▶ AG-1 Reduce Fossil Fuel Consumption in Field Equipment
- ▶ AG-2 Promote Sustainable Agriculture Equipment
- ▶ AG-3 Expand Carbon Farming Practices
- ▶ AG-7 Increase Sustainable Vineyard Certification
- ▶ AG-9 Avoid or Minimize Carbon Sequestration Losses Associated with Development Projects

METHODS

A variety of methods were used to quantify project-generated emissions. Specific methods for each source are described below in detail. Activities that could potentially generate GHG emissions are listed first, followed by activities that decrease those emissions.

EMISSIONS SOURCES

Construction

Initial vegetation removal, land clearing, and irrigation installation would require heavy-duty diesel equipment and daily construction worker commute trips, which generate GHG exhaust emissions. Using anticipated equipment use information, emissions factors for each piece of equipment were obtained from CalEEMod's Appendix G (CalEEMod 2024), which provides emissions factors in grams per hour. GHG emissions were quantified by applying default equipment load factors and anticipated total equipment hours. Regarding vehicular travel from construction workers, passenger vehicle emissions factors were derived from CARB's Emissions Estimator Model (EMFAC) 2021 for Napa County (CARB 2024). Default CalEEMod trip lengths for projects in Napa County were used to quantify emissions. Table 1 below summarizes the primary inputs used to quantify construction emissions. Attachment A includes all model inputs and outputs.

Table 1 Construction Activity Data

Activity	Equipment	Equipment Hours	Workers/day
Vegetation Clearing	1 D8 Dozer	160	5
	1 Medium Excavator	80	
	1 Haul Truck (onsite use)	60	
	1 Wood Chipper	80	
Ripping/Disking	1 D8 Dozer	40	25
Irrigation Installation	1 Medium Excavator	80	10
	1 Backhoe	80	
Erosion Control	NA	NA	5

Notes: Erosion control activities do not require the use of heavy-duty diesel equipment. NA = Not Applicable.

Source: Neigher, pers. comm., 2024.

Operations

EMISSIONS INCREASES

Vineyard Production

Emissions associated with vineyard production include vehicle use from employees, truck hauling from the grape harvest, and periodic mowing. Table 2 below shows the assumed levels of these activities. These activity levels were multiplied by the appropriate CalEEMod emissions factor to calculate total emissions.

Table 2 Operations Activity Data

Activity	Model Input	Assumption
Employee Commute	1,260 trips/year (1 manager, 22 workers, 2 trips/day)	10 miles/trip
Grape Hauling	32 Haul Trips/year	10 miles/trip
Landscape Maintenance	1 lawn mower	48 hours/year

Note: Trip lengths derived from CalEEMod defaults for Napa County. Mowing assumed 4 hours/month.

Source: Neigher, pers. comm., 2024.

Water Pumping

For irrigation and heat protection, the vineyard would use 9.83 acre-feet per year of groundwater pumped from the Gate Hill Well (Richard C. Slade and Associates LLC 2024: 10). This groundwater pumping has associated electricity usage, which in turn has GHG emissions. These GHG emissions were calculated assuming 453 kilowatt-hours per acre-foot for groundwater pumping (Next 10 2024: 18), and an assumed emissions intensity of 44 pounds of carbon dioxide equivalent (CO₂e) per megawatt-hour from Marin Clean Energy (California Energy Commission 2024). This emissions intensity was assumed to decline over time to reach a value of zero in 2045, per the State of California's carbon neutrality goals from AB 1279.

Felled Trees

The existing onsite trees sequester atmospheric carbon through photosynthesis. The project would cause trees to be cut down and removed, resulting in the loss of their future potential to sequester carbon. It was estimated that a total of 1,380 trees would be felled during construction activity, of the species and average diameter at breast height (DBH)

shown in the table below (WRA Environmental Consultants 2024: 3). These trees were matched with their appropriate carbon sequestration values from the United States Department of Agriculture's (USDA's) i-Tree tool (USDA 2024). Removing the existing trees also results in the removal of carbon currently stored in the trees. However, as the project description indicates that these would ultimately be turned into biochar, it was assumed that potential (i.e., if they were burned) emissions associated with the carbon stock in existing trees would not occur; therefore, not resulting in any increase to atmospheric carbon.

Tables 3 shows the calculation of lost sequestration potential and Table 4 quantifies, for informational purposes, the amount of stored carbon from the removed trees, which is applied as a no net increase in emissions in the analysis below.

Table 3 Lost Sequestration Potential from Removed Trees on Project Site

Species	Estimated No. Across Grading Limits	Average Diameter at Breast Height (Inches)	MTCO ₂ e sequestered, per tree per year from i-Tree	MTCO ₂ e sequestered per year across all trees within grading limits
California buckeye (<i>Aesculus californica</i>)	37	6.0	0.088	3.25
Pacific madrone (<i>Arbutus menziesii</i>)	269	7.1	0.114	30.70
Douglas fir (<i>Pseudotsuga menziesii</i>)	24	8.5	0.048	1.15
Coast live oak (<i>Quercus agrifolia</i>)	977	17.1	0.174	170.24
California black oak (<i>Quercus kelloggii</i>)	73	61.9	0.004	0.33
Total	1,380	NA	0.149^a	205.67

Note: MTCO₂e = metric tons of carbon dioxide equivalent, NA = not applicable

^a Weighted average sequestration rate per tree based on the distribution of tree species.

Source: Prepared by Ascent in 2024.

Table 4 Stored Carbon from Removed Trees on Project Site

Species	USDA Species Group ^a	Estimated No. Across Grading Limits	Average Diameter at Breast Height (Inches)	Mass per Felled Tree (kg) ^a	MTCO ₂ e Sequestered in Mass of Felled Trees in Grading Limits ^b
California buckeye (<i>Aesculus californica</i>)	Mixed Hardwood	37	6.0	73	5
Pacific madrone (<i>Arbutus menziesii</i>)	Mixed Hardwood	269	7.1	110	54
Douglas fir (<i>Pseudotsuga menziesii</i>)	Douglas-Fir	24	8.5	196	9
Coast live oak (<i>Quercus agrifolia</i>)	hard maple\oak\hickory\beech	977	17.1	1,296	2,322
California black oak (<i>Quercus kelloggii</i>)	hard maple\oak\hickory\beech	73	61.9	29,694	3,974
Total		1,380	NA	NA	6,364

Note: MTCO₂e = metric tons of carbon dioxide equivalent, NA = not applicable, USDA = United States Department of Agriculture

^a Based on the biomass equation in "National-Scale Biomass Estimators for the United States Tree Species" Jenkins et al. 2003.

^b Half of the tree mass is carbon, based on the composition of lignin and cellulose. Convert carbon to CO₂ by multiplying 44/12.

Source: Prepared by Ascent in 2025.

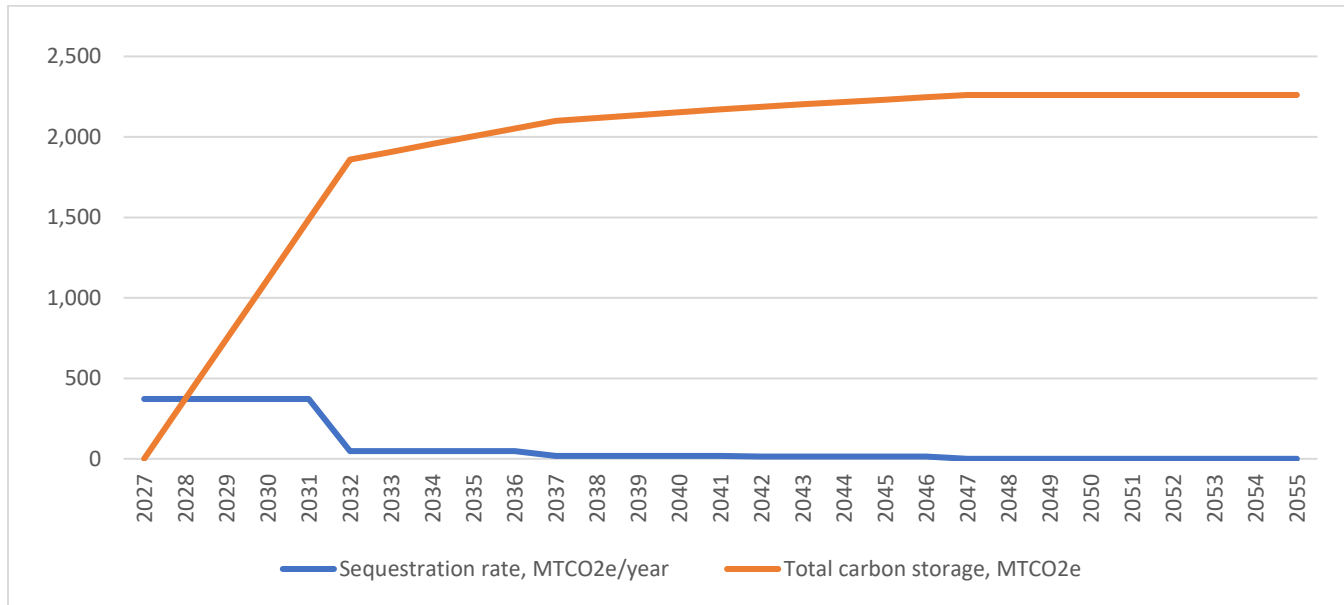
Cleared Ground Cover

In addition to the trees described above, the project site has ground cover plants, including grasses, weeds, and native plants (WRA 2023). This ground cover occurs on approximately 70 percent of the site (calculated based on an acre-weighted average of data from PPI Engineering's Soil Loss Analysis [2023]). Data on the quantities of each specific ground cover plant onsite were unavailable. However, data was available regarding the quality of acreage to be removed (i.e., 45 percent high-quality and 55 percent low-quality) (WRA, 2024). Low-quality was assumed to be non-native grassland and high-quality was assumed to be native grasslands. Applying the 70 percent of total ground cover of the site to the 16.7 acres to be developed and further weighting the ratio between high-and low-quality land, a weighted average value of 9.4 MTCO₂e per acre of sequestration potential was calculated using native and nonnative grassland values presented in Kotkeen, Baldocchi, and Harte (2011: 4).

DECREASES IN EMISSIONS

Vineyard Growth

The new grapevines planted onsite would sequester carbon through photosynthesis. Sequestration rates for grapevines were calculated based on a study by Song, Zhu, Zhang, Li, and Wang (2023). This study showed carbon storage over 20 years in a vineyard based on a density of 1,350 vines per acre. The Boisset property, however, is assumed to have an average of 2,833 vines per acre (averaged across possible density values of 4,000, 2,700, and 1,800 vines per acre provided in response to the Request for Information [Neigher, pers. comm., 2024]), which is 2.1 times higher than the study's density. Due to the denser planting on the Boisset property, the sequestration rates calculated based on the study data were multiplied by the ratio of the densities, or 2.1, for this analysis. Figure 2 below shows the sequestration rates (in metric tons of carbon dioxide equivalent, or MTCO₂e, per year) and the total carbon stored (in MTCO₂e) for the Boisset property. The grapevines grow quickly in the first few years after planting (thus sequestering more carbon during this time). However, as they reach their full size, their growth rate slows, and thus, they sequester carbon at a slower rate. As stated above, the data on carbon storage encompassed a 20-year period; as a conservative estimate, it was assumed that the sequestration rate would slow to zero after 20 years because, at that time, the vines would be fully grown.



Note: MTCO₂e = metric tons of carbon dioxide equivalent.

Source: Prepared by Ascent in 2024.

Figure 2 Carbon Sequestration Rates and Total Carbon Sequestered by Grapevines in the Boisset Vineyard

Cover Crops and Mulching

Crops planted onsite sequester carbon through photosynthesis, and adding mulch improves the ability of the soil to store carbon. The types and quantities of cover crops and mulching were sourced from the Erosion Control Plan (PPI Engineering 2024: 7-10). These values were matched with the appropriate carbon sequestration rates from the California Department of Food and Agriculture's COMET-Planner tool (2024). These rates are 1.07, 1.64, and 0.341 MTCO₂e per year for non-leguminous cover crops, leguminous cover crops, and mulching, respectively.

Preserved Trees and Grasslands (Excluded)

It was assumed that approximately 16.7 acres of woodlands with a non-native grassland understory would be preserved. This acreage value represents a 1:1 ratio to the approximately 16.7 acres of land graded during vineyard construction (see the project's Supplemental Project Information [Neigher, pers. comm., 2024]). Table 5 below shows the carbon sequestered by this preservation. However, this information is provided solely for disclosure purposes, and GHG sequestration associated with undeveloped land on the site is not included in the project's net GHG estimates.

Table 5 Carbon Sequestration from Preserved Trees and Grasslands

Item	Description	Value	Source
A	Acres of land graded	16.7	Supplemental Project Information provided by Neigher, pers. comm., 2024.
B	Total trees within grading limits	1,380	WRA Environmental Consultants 2024: 3
C	Estimated trees per acre	83	B/A
D	Acres of woodland preserved	26.6	Assumes 2:1 ratio of land preserved to land graded
E	Total trees preserved	2,179	C x D

Item	Description	Value	Source
F	Weighted average MTCO ₂ e sequestered, per tree per year	0.149	Table 3
G	MTCO ₂ e sequestered, per acre of grassland per year	9.4	See "Cleared Ground Cover" section above; derived based on data from Kotkeen, Baldocchi, and Harte (2011: 4)
H	Total MTCO ₂ e sequestered per year due to preservation of trees	324	E x F
I	Total MTCO ₂ e sequestered per year due to preservation of grasslands	248	D x G x assumed grassland ground cover of 70 percent (See "Cleared Ground Cover" section above)
J	Total MTCO ₂ e sequestered per year due to preservation of trees and grasslands	572	H + I

Note: MTCO₂e = metric tons of carbon dioxide equivalent.

Source: Prepared by Ascent in 2024.

ASSESSMENT AND RECOMMENDATIONS

The following section provides criteria used to evaluate project significance in the CEQA context, a summary of emissions results, and project recommendations.

EVALUATION CRITERIA

The criteria used to evaluate project impacts on climate change under CEQA are based on Section 15064 of the CEQA Guidelines and relevant portions of Appendix G of the State CEQA Guidelines, which recommend that a lead agency consider a project's consistency with relevant, adopted plans and discuss any inconsistencies with applicable regional plans, including plans to reduce GHG emissions. Implementation of the project would result in a cumulatively considerable contribution to climate change if it would:

- ▶ generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- ▶ conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

As described above, both the Bay Area Air District and SMAQMD have developed CEQA guidance and project-specific criteria that may be used for development projects to demonstrate consistency with California's GHG reduction goals, outlined in the 2022 Scoping Plan. Using available guidance from applicable air districts (Bay Area Air District and SMAQMD), the project would result in a cumulatively significant climate change effect if it would:

- ▶ generate construction emissions exceeding 1,100 MTCO₂e/year for any year of construction and not incorporate recommended qualitative construction BMPs.
- ▶ Be inconsistent with qualitative project design features recommended by applicable air districts (i.e., prohibition of natural gas and meeting CalGreen Tier 2 Standards for EV charging) and exceed SMAQMD's operational GHG screening level of 1,100 MTCO₂e/year

EMISSIONS RESULTS

Table 6 shows the net effect of the increases and decreases in emissions from construction sources (e.g., equipment use) and operational emissions sources (e.g., net changes in carbon sequestration potential). The net changes in carbon sequestration account for the sequestration loss from existing grassland and trees and the additional

sequestration from vineyard growth. During construction, this includes loss from the annual sequestration potential of removed trees and cleared grassland. During operations, in addition to the loss of annual sequestration potential, additional sequestration from vineyard growth is also included. The maximum operational year represents the first year in which annual sequestration from vineyard growth plateaus and, thus, contributes to the highest annual emissions across the project lifetime.

Based on modeling conducted, the maximum construction and operational years would be 2026 and 2047, respectively.

Table 6 Construction and Operational Emissions Results (MTCO₂e per year)

Emissions Source	Max Construction Year (2026)	Max Operation Year (2047)
Construction Equipment	54	N/A
Vineyard Operations	N/A	4
Loss of Sequestration Potential ¹	316	316
Sequestration from Vineyard	N/A	-21
Total	370	299
Threshold	1,100 MTCO ₂ e	1,100 MTCO ₂ e
Exceeds Numerical Threshold?	No	No

Note: Represents the annual rate of loss in sequestration potential from the removed trees and cleared grass. In the construction year, these emissions would combine with equipment use emissions to represent the maximum year. Totals may not sum exactly due to rounding.

Source: Prepared by Ascent in 2025.

As shown in Table 6, project construction and operation would not exceed the recommended GHG emissions limit of 1,100 MTCO₂e/year. In addition, the project would not include any natural gas infrastructure, consistent with the State's recommendation for local land use development projects, outlined in the 2022 Scoping Plan and elaborated by the Bay Area Air District and SMAQMD's CEQA guidance. Regarding the requirement to include EV charging infrastructure consistent with CalGreen Tier 2 standards, the project does not propose the development of any onsite parking. The vineyard would be hand-farmed seasonally, and the harvested product would be loaded into delivery trucks to transport for production. Because the project would not support regular vehicle use or construct onsite parking, installation of EV infrastructure would not be required; nonetheless, one EV charger would be installed (see below for further discussion).

As discussed above, the recently released public draft RCAAP includes GHG reduction strategies that could apply to the proposed project. However, considering the RCAAP is not adopted, this analysis does not rely on consistency with the RCAAP as a CEQA threshold of significance but does provide a review of project design features and their consistency with vineyard-related GHG (draft) strategies in the RCAAP. See Table 7 below.

Table 7 (Draft) RCAAP Consistency Analysis

RCAAP Draft GHG Reduction Strategy	Max Operation Year (2047)
BE-4 Increase Sustainable Winery Certification	The project would obtain Napa Green Certification. Consistent.
TR-3 Expand Electric Vehicle Charging Infrastructure	The project would include one onsite EV charger that can be used by passenger vehicles or electric field equipment. Consistent
SW-2 Reduce Construction and Demolition Waste	Felled trees and biomass would be converted to biochar, reducing waste generation and avoiding GHG emissions that could occur from landfilling or burning. Consistent.
AG-1 Reduce Fossil Fuel Consumption in Field Equipment	The project would include one onsite EV charger that can be used by passenger vehicles or electric field equipment. In addition, if field equipment is required, EVs or alternative fuels (e.g., renewable diesel) would be used. Consistent.

AG-2 Promote Sustainable Agriculture Equipment	The project would include one onsite EV charger that can be used by passenger vehicles or electric field equipment. In addition, if field equipment is required, EVs or alternative fuels (e.g., renewable diesel) would be used. Consistent.
AG-3 Expand Carbon Farming Practices	The project would obtain Napa Green Vineyard certification which would include prohibitions on pesticide use, irrigation assessment to optimize water use, and the vineyard would be hand-farmed, reducing the use of onsite diesel or gasoline equipment. Consistent.
AG-7 Increase Sustainable Vineyard Certification	The project would obtain Napa Green Vineyard certification which would include prohibitions on pesticide use, irrigation assessment to optimize water use, and the vineyard would be hand-farmed, reducing the use of onsite diesel or gasoline equipment. Consistent.
AG-9 Avoid or Minimize Carbon Sequestration Losses Associated with Development Projects	The Project consists of the planting of ten (10) strategically arranged vineyard blocks, with an average slope of 26% between all blocks. The Project has been designed to meet the 2 to 1 oak woodland retention General Plan Policy CON-24 goal, resulting in a balanced mix agriculture and native habitats in keeping with the General Plan's policies supporting both agriculture and conservation. Consistent.

As shown above, a number of GHG reduction strategies are currently proposed in the draft RCAAP that pertain to vineyard operations, and the project has been designed to be consistent with these.

Other guidance relating to GHG emissions and best practices come from the Bay Area Air District, which provides a qualitative best management practices (BMP) approach for construction-related GHG emissions. All BMPs were reviewed in the context of this project, and while many of them apply to traditional construction activities, some would apply to the project. The following measures should be implemented, consistent with Bay Area Air District's CEQA Guidelines:

- ▶ Require all diesel-fueled off-road construction equipment be equipped with EPA Tier 4 Final compliant engines or better as a condition of the bid contract.
- ▶ Minimize idling time either by shutting equipment off when not in use or reducing the time of idling to no more than 2 minutes (a 5-minute limit is required by the state airborne toxics control measure [Title 13, Sections 2449(d)(3) and 2485 of the California Code of Regulations]). Provide clear signage that posts this requirement for workers at the entrances to the site and develop an enforceable mechanism to monitor idling time to ensure compliance with this measure.
- ▶ Prohibit off-road diesel-powered equipment from being in the "on" position for more than 10 hours per day.
- ▶ Use CARB-approved renewable diesel fuel in off-road construction equipment and on-road trucks.

CONCLUSION

With incorporation of the above BMPs for construction activity and because the project construction and operational emissions would not exceed 1,100 MTCO₂e/year, the project would not result in a cumulatively considerable increase in GHG emissions.

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Attachment A

GHG Emissions Modeling

Carbon Sequestration Summary

Increase or decrease

Increase
Increase
Increase
Increase

Decrease
Decrease
Decrease

Short Name

Construction
Operations
Water Pumping
Cleared Grasslands

Preserved Trees
Vines
Soil Management Practices (COMET-Planner)

Annual emissions, MT CO2e over 30-year timeframe

	Construction	Operations	Operations	Operations
	2026	2027	2028	2029
Construction vehicle (on and offroad) emissions	54	-	-	-
Vineyard Operations		4	4	4
Water pumping for irrigation	0	0	0	0
Lost annual sequestration from cleared grasslands	110	110	110	110
Lost annual sequestration from removed trees	206	206	206	206
Sequestration from preserved trees	-	-	-	-
Sequestration from vines growing	0	-372	-372	-372
Adding cover crops and mulching (use COMET-planner)	0	-21	-21	-21
Annual emissions	369	-74	-74	-74
Cumulative emissions	369	295	221	146

Operations	Operations	Operations	Operations	Operations	Operations	Operations	Operations	Operations
2030	2031	2032	2033	2034	2035	2036	2037	
-	-	-	-	-	-	-	-	-
4	4	4	4	4	4	4	4	4
0	0	0	0	0	0	0	0	0
110	110	110	110	110	110	110	110	110
206	206	206	206	206	206	206	206	206
-	-	-	-	-	-	-	-	-
-372	-372	-48	-48	-48	-48	-48	-48	-18
-21	-21	-21	-21	-21	-21	-21	-21	-21
-74	-74	249	249	249	249	249	249	280
72	-3	246	496	745	994	1243	1523	

Operations	Operations	Operations	Operations	Operations	Operations	Operations	Operations	Operations
2038	2039	2040	2041	2042	2043	2044	2045	
-	-	-	-	-	-	-	-	-
4	4	4	4	4	4	4	4	4
0	0	0	0	0	0	0	0	-
110	110	110	110	110	110	110	110	110
206	206	206	206	206	206	206	206	206
-	-	-	-	-	-	-	-	-
-18	-18	-18	-18	-15	-15	-15	-15	-15
-21	-21	-21	-21	-21	-21	-21	-21	-21
280	280	280	280	283	283	283	283	283
1803	2083	2362	2642	2925	3208	3491	3773	

Operations	Operations	Operations	Operations	Operations	Operations	Operations	Operations	Operations	Operations
2046	2047	2048	2049	2050	2051	2052	2053	2054	
-	-	-	-	-	-	-	-	-	-
4	4	4	4	4	4	4	4	4	4
-	-	-	-	-	-	-	-	-	-
110	110	110	110	110	110	110	110	110	110
206	206	206	206	206	206	206	206	206	206
-	-	-	-	-	-	-	-	-	-
-15	0	0	0	0	0	0	0	0	0
-21	-21	-21	-21	-21	-21	-21	-21	-21	-21
283	297	297	297	297	297	297	297	297	297
4056	4354	4651	4948	5246	5543	5840	6138	6435	

Operations

2055

-

4

-

110

206

-

0

-21

297

6732

Water Pumping

Quantity	Description
9.83	Acre-feet per year
453	kWh per acre-foot of groundwater pumped
4,453	kWh per year
4.45	MWh per year
44	2022 MCE Light green power mix, lbs CO2e / MWh
0.02	2022 MCE Light green power mix, MT CO2e / MWh
0.09	2022 Irrigation emissions per year, MT CO2e

Source
WAA page 10:The sum of these proposed future onsite uses of groundwater pumped from the Gate Hill Well is 9.83 AFY.
Unit conversion
Unit conversion
Unit conversion
Unit conversion
0 Assumed to be zero to comply with AB 1279 (carbon neutrality by 2045)

Other notes
Shows Napa is in San Francisco Bay
Shows CCA provider for the Project is MCE

Interpolate emissions from 2025 - 2055	
2022	0.09
2045	

Yr index	Yr	Irrigation emissions per year, MT CO2e
1	2026	0.07
2	2027	0.07
3	2028	0.07
4	2029	0.06
5	2030	0.06
6	2031	0.05
7	2032	0.05
8	2033	0.05
9	2034	0.04
10	2035	0.04
11	2036	0.03
12	2037	0.03
13	2038	0.03
14	2039	0.02
15	2040	0.02
16	2041	0.02
17	2042	0.01
18	2043	0.01
19	2044	0.00
20	2045	0.00
21	2046	0.00
22	2047	0.00
23	2048	0.00
24	2049	0.00
25	2050	0.00
26	2051	0.00
27	2052	0.00
28	2053	0.00
29	2054	0.00
30	2055	0.00

NEXT 10

TABLE 4 California Electricity (kWh/AF) and Natural Gas (MMBtu/AF) Energy Intensities by Hydrologic Region, by Water Cycle Stage

	North Coast	San Francisco Bay	Central Coast	South Coast	Sacramento River	San Joaquin River	Tulare Lake	North Lahontan	South Lahontan	Colorado River
Electricity Energy Intensity (kWh/AF)										
1. Water Generation/Extraction										
Groundwater Pumping	343	453	479	647	350	365	450	320	433	494

Felled Trees

Species	Total No. across Plots	Average / Plot	Average diameter at Breast Height (inches)	Estimated No. across Grading Limits	Estimated No. across Property	lbs CO2e per tree sequestered over NEXT 20 years	MT CO2e per tree sequestered over NEXT 20 years	MTCO2e sequestered per tree per year	MTCO2e sequestered per year across all trees within grading limits
California buckeye (<i>Aesculus californica</i>)	3	0.2	6	37	123	3,878	1.8	0.088	3.3
Pacific madrone (<i>Arbutus menziesii</i>)	22	1.6	7.1	269	899	5,033	2.3	0.114	30.7
Douglas fir (<i>Pseudotsuga menziesii</i>)	2	0.1	8.5	24	82	2,109	1.0	0.048	1.1
Coast live oak (<i>Quercus agrifolia</i>)	80	5.7	37.1	977	3,269	7,683	3.5	0.174	170.2
California black oak (<i>Quercus kelloggii</i>)	6	0.4	61.9	73	245	197	0.1	0.004	0.3
Total	113	8.1	--	1,380	4,617	NA	NA	0.149	205.7

[1] Based on biomass equation in "National-Scale Biomass Estimators for United States Tree Species" Jenkins et al. 2003
[2] Half of tree mass is carbon, based on the composition of lignin and cellulose. Convert C to CO2 by multiplying 44/12. <https://climate.earthathome.org/photosynthesis-calculating-biomass-and-carbon-storage-in-trees/>
[3] <https://treerier.com/tree-age-calculator/>

MyTree Benefits

Over 20 years.

Buckeye spp. (*Aesculus*)

Serving Size: 6.00 in. diameter

Condition: Excellent

Location: Napa, Ca, United States

Expected over 20 years: \$93.92

Discover benefits of all your community trees!

Carbon Dioxide Uptake \$90.18

Carbon Sequestered¹ 1,057.54 lbs

CO₂ Equivalent² 3,877.65 lbs

MyTree Benefits

Over 20 years.

Pacific madrone (*Arbutus menziesii*)

Serving Size: 7.10 in. diameter

Condition: Excellent

Location: Napa, Ca, United States

Expected over 20 years: \$121.54

Discover benefits of all your community trees!

Carbon Dioxide Uptake \$117.04

Carbon Sequestered¹ 1,372.54 lbs

CO₂ Equivalent² 5,032.64 lbs

MyTree Benefits

Over 20 years.

Douglas fir (*Pseudotsuga menziesii*)

Serving Size: 8.50 in. diameter

Condition: Excellent

Location: Napa, Ca, United States

Expected over 20 years: \$52.06

Discover benefits of all your community trees!

Carbon Dioxide Uptake \$49.06

Carbon Sequestered¹ 575.31 lbs

CO₂ Equivalent² 2,109.47 lbs

MyTree Benefits

Over 20 years.

Coastal live oak (*Quercus agrifolia*)

Serving Size: 17.10 in. diameter

Condition: Excellent

Location: Napa, Ca, United States

Expected over 20 years: \$188.91

Discover benefits of all your community trees!

Carbon Dioxide Uptake \$178.89

Carbon Sequestered¹ 2,095.37 lbs

CO₂ Equivalent² 7,683.03 lbs

437.8

MyTree Benefits

Over 20 years.

California black oak (*Quercus kelloggii*)

Serving Size: 61.90 in. diameter

Condition: Excellent

Location: Napa, Ca, United States

Expected over 20 years: \$34.60

Discover benefits of all your community trees!

Carbon Dioxide Uptake \$4.99

Carbon Sequestered¹ 53.79 lbs

CO₂ Equivalent² 197.23 lbs

Table 4. Parameters and equations* for estimating total aboveground biomass for all hardwood and softwood species in the United States.

Species group		Parameters		Data points ¹	Max ¹¹ dbh cm	RMSE ¹ log units	R ²
		β ₀	β ₁				
Hardwood	Aspen/alder/cottonwood/willow	-2.2094	2.3867	230	70	0.507441	0.953
	Soft maple/birch	-1.9123	2.3651	316	66	0.491685	0.958
	Mixed hardwood	-2.4800	2.4835	289	56	0.360458	0.980
	Hard maple/oak/hickory/beechn	-2.0127	2.4342	485	73	0.236483	0.988
Softwood	Cedar/larch	-2.0336	2.2592	196	250	0.294574	0.981
	Douglas-fir	-2.2304	2.4435	165	210	0.218712	0.992
	True fir/hemlock	-2.5384	2.4814	395	230	0.182329	0.992
	Pine	-2.5356	2.4349	331	180	0.253781	0.987
	Spruce	-2.0773	2.3323	212	250	0.250424	0.988
Woodland ¹¹	Juniper/oak/mesquite	-0.7152	1.7029	61	78	0.384331	0.938

* Biomass equation:
 $bm = \text{Exp}[\beta_0 + \beta_1 \ln dbh]$

where

bm = total aboveground biomass (kg) for trees 2.5cm dbh and larger

dbh = diameter at breast height (cm)

Exp = exponential function

ln = natural log base "e" (2.718282)

¹ Number of data points generated from published equations (generally at 5 cm dbh intervals) for parameter estimation.

¹¹ Maximum dbh of trees measured in published equations.

¹ Root mean squared error or estimate of the standard deviation of the regression error term in natural log units.

¹ Woodland group includes both hardwood and softwood species from dryland forests.

Cleared Ground Cover

ience.iop.org/article/10.1088/1748-9326/6/4/044001/pdf

kg per meter per year C sequestration data - screenshot below

Non-native grassland values used. From BRRS:

The Study Area is composed of developed, **non-native grassland**, coast live oak woodland, and ephemeral streams.

non-native	native	native	nonnative
0.26	0.54		
0.36	0.85		
0.35	0.63		
0.48	0.83	0.937778	0.38 kg C per meter squared per year (average) from LE Koteen et al
0.35	1.38	0.000938	0.00038 MT C per meter squared per year
0.48	1	3.795055	1.537807 MT C per acre per year
	0.83	13.92	5.64 MT CO2e per acre per year
	1.38	16.7	16.7 Disturbed acres
	1	70.3%	70.3% Percent of disturbed acres assumed to have non-native grassland understory (from soil loss analysis)
		163.28	66.0 MT CO2e per year across all disturbed acres (non native only_

	Acre	Percent	Weighted Avg. Sequestration
Low Quality Conversion	9.18	0.55	9.35 weighted MT C per acre per percent of high-to-low quality land converted (WRA 2024)
High-Quality Conversion	7.48	0.45	109.5 MT CO2e per year (weighted based on native/nonnative land coverage)
	16.7	11.70597	applied percent of disturbed acres per Soil Loss Analysis (70 percent)

Table 1. Ecosystem carbon pools and annual fluxes, units are kg m⁻². TV = Tennessee Valley. BLP = Bolinas Lagoon Preserve. Soil carbon, annual root, shoot and combined productivity, and soil respiration for native and non-native grass communities at Tennessee Valley and the Bolinas Lagoon Preserve, for the water years 2003–4, 2004–5 and 2005–6. Values in parentheses represent +/– one standard deviation, *n* = 5. ANOVA was used to detect differences between mean values. Different letters indicate significant differences at *p* < 0.05.

Site		2003–4					
	Species type	Shoot productivity (carbon)	Root productivity (carbon)	Root to shoot ratio	Total productivity (carbon)	Soil respiration ^a	Total soil carbon
TV	Agrostis (native)	0.33 (0.11) a	0.21 (0.07) a	0.82	0.54 (0.13) a	0.42 (0.16) a	17.6 (0.4) a
	Festuca (native)	0.35 (0.16) a	0.50 (0.04) b	1.83	0.85 (0.17) b	0.67 (0.20) b	16.9 (0.4) a
	Non-native	0.12 (0.04) b	0.14 (0.02) a	1.65	0.26 (0.05) c	0.44 (0.12) a	14.9 (0.4) b
BLP	Native	0.26 (0.15) a	0.37 (0.05) a	1.45	0.63 (0.16) a	^a	14.7 (0.4) a
	Non-native	0.17 (0.04) a	0.20 (0.03) b	1.36	0.36 (0.05) b	^a	9.5 (0.2) b
		2004–5					
TV	Agrostis (native)	0.42 (0.08) a	0.41 (0.14) a	1.29	0.83 (0.16) a	0.72 (0.18) a	
	Festuca (native)	0.37 (0.13) a	1.01 (0.08) b	3.43	1.38 (0.16) b	0.78 (0.26) a	
	Non-native	0.22 (0.04) b	0.14 (0.02) c	0.96	0.35 (0.04) c	0.77 (0.14) a	
BLP	Native	0.26 (0.10) a	0.74 (0.09) a	2.97	1.00 (0.14) a	0.99 (0.13) a	
	Non-native	0.28 (0.07) b	0.20 (0.03) b	0.8	0.48 (0.07) b	0.68 (0.15) b	
		2005–6					
TV	Agrostis (native)	0.42 (0.06) a	0.41 (0.34) a	1.29	0.83 (0.35) a	0.74 (0.17) a	
	Festuca (native)	0.37 (0.10) a	1.01 (0.47) b	3.43	1.38 (0.48) b	0.79 (0.18) ab	
	Non-native	0.22 (0.03) b	0.14 (0.12) c	0.96	0.35 (0.12) c	0.84 (0.20) b	
BLP	Native	0.26 (0.08) a	0.74 (0.09) a	2.97	1.00 (0.12) a	0.76 (0.13) a	
	Non-native	0.28 (0.05) b	0.20 (0.03) b	0.8	0.48 (0.06) b	0.64 (0.14) a	

^a These values are derived from soil respiration measurements from soil collars. in which the aboveground vegetation was removed.

Construction/Ops Summary

Item	MTCO2e per year	One-time or annual?	Notes
Project Construction (Offroad)	23.00	One-time in 2026	Includes fuel consumed by: Dozer, Excavator, Backhoe, Wood Chipper, Haul Truck
Project Construction (Onroad)	31.22	One-time in 2026	Includes worker trips during construction
Project Operations (Onroad)	3.50	Annual starting in 2026	Includes worker trips, grape hauling during crush, and lawnmowing

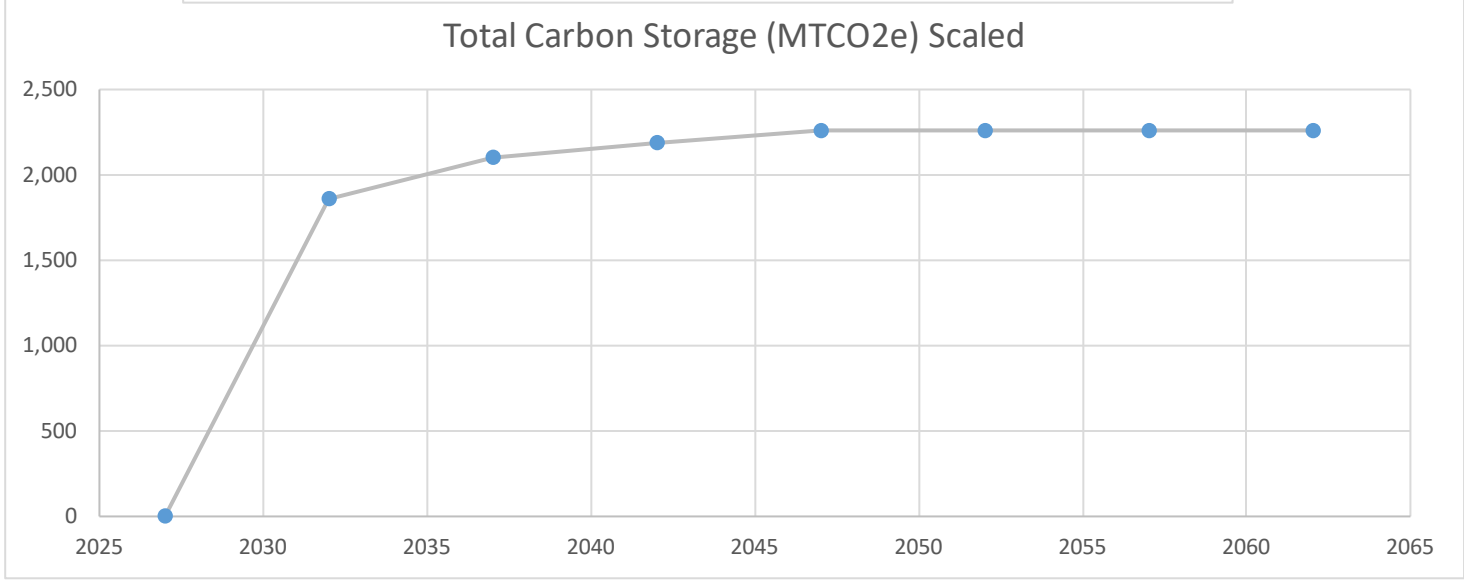
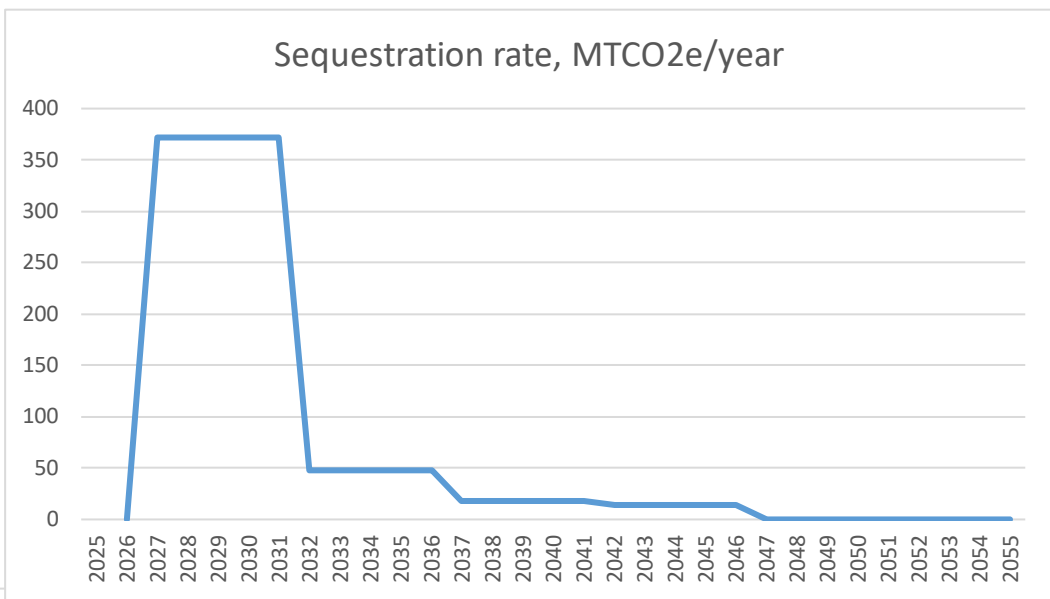
Note: See "Construction and Ops Detail" tab for the derivation of these values

Vineyard Growth

Song et al: A Simple Method Using an Allometric Model to Quantify the Carbon Sequestration Capacity in Vineyards https://www.mdpi.com/2223-7747/12/5/997	
The amounts of the total carbon storage in the 5-year-old, 10-year-old, 15-year-old, and 20-year-old vineyards were 50.22 t·ha−1, 56.73 t·ha−1, 59.10 t·ha−1, and 61.06 t·ha−1, respectively.	
Vines per hectare (Song et al)	3,335
Vines per acre (Song et al)	1,350
Vines per acre (Boisset Project)	2,833
Density scalar	2.1 <----Boisset project vineyard is more dense than Song et al-scale results accordingly

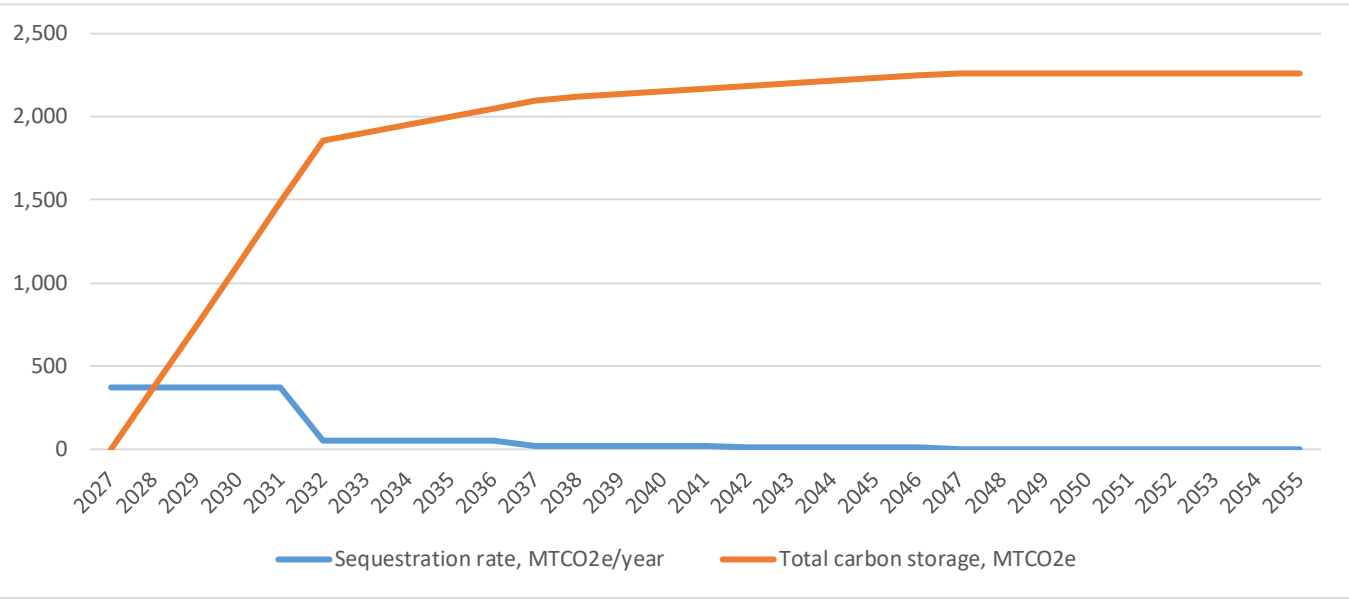
QC check	TRUE	TRUE
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		Convert from C to CO2e	Scale up to denser Boisset vineyard	Convert from per hectare to per acre	Convert to metric tons	Get total carbon storage at Boisset Calculate sequestration rate	
Calculation of MT CO2e of carbon at Boisset	SONG ET AL	SONG ET AL	BOISSET	BOISSET	BOISSET	BOISSET	BOISSET
Year	Total Carbon Storage (tC·ha−1) Unscaled	Total Carbon Storage (tCO2e·ha−1) Unscaled	Total Carbon Storage (tCO2e·ha−1) Scaled	Total Carbon Storage (tCO2e·acre−1) Scaled	Total Carbon Storage (MTCO2e·acre−1) Scaled	Total Carbon Storage (MTCO2e) Sc	Sequestration rate (MTCO2e / yr)
2027	0	0	-	-	-	-	371.8326447
2032	50.22	184	386.57	156.44	141.92	1,859.16	48.20052802
2037	56.73	208	436.68	176.72	160.32	2,100.17	17.54765767
2042	59.1	217	454.93	184.10	167.02	2,187.50	14.51198693
2047	61.06	224	470.01	190.21	172.55	2,260.46	0
2052	61.06	224	470.01	190.21	172.55	2,260.46	0
2057	61.06	224	470.01	190.21	172.55	2,260.46	0
2062	61.06	224	470.01	190.21	172.55	2,260.46	NA
		3.67	2.10	0.40	0.91		



Average sequestration rate per year per acre (MTCO2e/acre/year)		
5.751817014		
Show by-year carbon sequestration rate		
Sequestration rate, MTCO2e/year	Total carbon storage, MTCO2e	
2025		
2026	0	0
2027	372	0
2028	372	372
2029	372	744
2030	372	1,115
2031	372	1,487
2032	48	1,859
2033	48	1,907
2034	48	1,956
2035	48	2,004
2036	48	2,052
2037	18	2,100
2038	18	2,118
2039	18	2,135
2040	18	2,153
2041	18	2,170
2042	15	2,188
2043	15	2,202
2044	15	2,217
2045	15	2,231
2046	15	2,246
2047	0	2,260
2048	0	2,260
2049	0	2,260
2050	0	2,260
2051	0	2,260
2052	0	2,260
2053	0	2,260
2054	0	2,260
2055	0	2,260

Year	Sequestration rate, MTCO2e/year	Total carbon storage, MTCO2e
2021	0	0
2022	0	0
2023	0	0
2024	0	0
2025	0	0
2026	0	0
2027	372	372
2028	372	744
2029	372	1116
2030	372	1488
2031	372	1860
2032	48	1908
2033	48	1956
2034	48	2004
2035	48	2052
2036	48	2100
2037	18	2118
2038	18	2136
2039	18	2154
2040	18	2172
2041	18	2190
2042	15	2208
2043	15	2220
2044	15	2232
2045	15	2244
2046	15	2256
2047	0	2260
2048	0	2260
2049	0	2260
2050	0	2260
2051	0	2260
2052	0	2260
2053	0	2260
2054	0	2260
2055	0	2260



Cover Crops and Mulching

Block	Disturbed Acres	Planted Acres	Percent of distubed acres with cover crops	Percent of disturbed acres with mulch	Sequestration (MT CO2e / disturbed acre / year
1	1.5	1.1	80%	100%	1.23
2	1.0	0.7	80%	100%	1.23
3	2.5	2.1	85%	100%	1.29
4	1.2	0.8	80%	100%	1.23
5	2.1	1.7	80%	100%	1.23
6	4.2	3.6	90%	100%	1.34
7	0.3	0.2	85%	100%	1.29
8	1.1	0.8	90%	100%	1.34
9	2.4	1.9	90%	100%	1.34
10	0.4	0.2	85%	100%	1.29
Avenue	0.1	0.0	0%	0%	0.00
Avenue	0.1	0.0	0%	0%	0.00
Total	16.7	13.1			

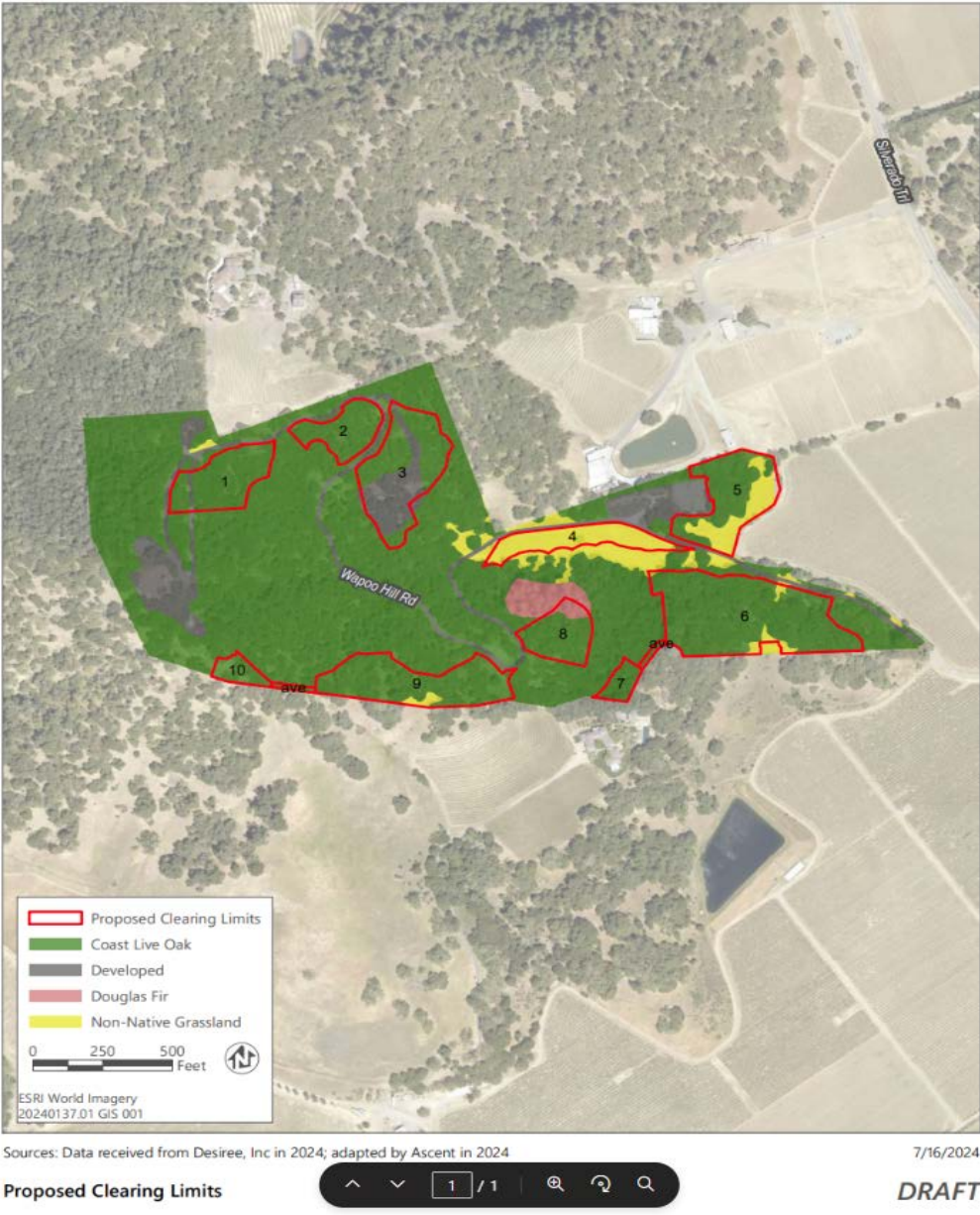
Total sequestration from cover cropping and mulching for all acres, MT CO2e/year
21.4

BOISSET COLLECTION
WAPPO HILL

Average Slope Of Proposed Vineyard Blocks

Block	Gross Acres	Net Acres	Slope #1	Slope #2	Average Slope
1A	1.2	1.0	25%	27%	26%
1B	0.3	0.1	25%	33%	29%
2	1.0	0.7	21%	34%	28%
3	2.5	2.1	23%	27%	25%
4	1.2	0.8	18%	19%	19%
5	2.1	1.7	20%	23%	22%
6	4.2	3.6	23%	29%	26%
7	0.3	0.2	28%		28%
8	1.1	0.8	25%	28%	27%
9	2.4	1.9	23%	28%	26%
10	0.4	0.2	27%		27%
Total	16.7	13.1			26%

Acres Cleared from GIS
[20240137_01_001_Data_20240716.pdf](#)
[Submittal-1-Wappo Hill Track I ECP\(2661282.1\).pdf](#)



Off-Road and On-Road GHG Emissions Summary

Using proposed construction and operational activity data, this sheet calculates GHG emissions from the use of offroad equipment and onroad worker vehicle use

Off-Road Emission Factor Calculation

			g/hp-hr		
Equipment	HP-Hrs	LE	CO2	CH4	N2O
Dozer	48400	0.40	528.560357	0.02144072	0.004288144
Excavator	49760	0.38	526.9882079	0.021376947	0.004275389
Backhoe	6720	0.37	529.8626973	0.021493549	0.00429871
Wood Chipper	1200	0.42	620.04	0.03	0.01
Haul Truck	5040	0.38	530.118455	0.021503923	0.004300785

On-Road Emissions Factors

Passanger Vehicle GHG Emissions Per Trip					
Grams GHG/Trip			MT GHG/Trip		
CO2	CH4	N2O	CO2	CH4	N2O
65.553	0.069	0.032	0.000065553	0.000000069	0.000000032
				CO2e/trip	0.000076152
Passanger Vehicle GHG Emissions Per Mile Traveled					
Grams GHG/Mile			MT GHG/Mile		
CO2	CH4	N2O	CO2	CH4	N2O
247.931	0.002	0.004	0.000247931	0.000000002	0.000000004
				CO2e/mil	0.000249077

Grape Haul Truck GHG Emissions Per Trip					
Grams GHG/Trip			MT GHG/Trip		
CO2	CH4	N2O	CO2	CH4	N2O
23.874	0.025	0.03	0.000023874	0.000000025	0.00000003
				CO2e/trip	0.000032739
Grape Haul Truck GHG Emissions Per Mile Traveled					
Grams GHG/Mile			MT GHG/Mile		
CO2	CH4	N2O	CO2	CH4	N2O
774.364	0.011	0.055	0.000774364	0.000000011	0.000000055
				CO2e/mile	0.000789676

Operational Lawn Emission Factor

			g/hp-hr		
Equipment	Hrs/yr	LE	CO2	CH4	N2O
1 Mower	48	0.38	657.61	0.03	0.01

Conversion Factors

Grams-Metric Tons

0.000001 g/MT

Carbon Dioxide Equivalent (CO2e)

Gas

GWP

CO2 1

CH4 27

N2O 273

Table 9 | GWP100 values and atmospheric lifetimes for a range of GHGs, based on AR6 WGI (Forster et al. 2021).

Gas	AR6 – GWP100	Lifetime
CO ₂	1	N/A
CH ₄ (biogenic)	27.0	11.8
CH ₄ (fossil – combustion) ^a	27.0	11.8
CH ₄ (fossil – fugitive and process)	29.8	11.8
N ₂ O	273	109
HFC-32	770	5.4
HFC-143a	5807	51
CF ₄	7379	50,000
C ₂ F ₆	12,410	10,000
C ₃ F ₈	9289	2600
C ₄ F ₁₀	10,022	2600
CSF ₁₂	9218	4100
C ₆ F ₁₄	8617	3100
C ₇ F ₁₆	8409	3000
c-C ₄ F ₈	13,902	3000
HFC-125	3744	30
HFC-134a	1526	14
HFC-152a	164	1.6
HFC-227ea	3602	36
HFC-23	14,590	228
HFC-236fa	8889	213
HFC-245fa	962	7.9
HFC-365mfc	913	8.9
HFC-43-10-mee	1599	17
SF ₆	25,184	3200
NF ₃	17,423	569

Project Construction (Offroad) GHG Emissions Calculation

Total Grams			Total Metric Tons		
CO2	CH4	N2O	CO2	CH4	N2O
10232928.51	415	208	10	0.00042	0.00021
9964714.626	404	213	10	0.00040	0.00021
1317450.61	53	29	1	0.00005	0.00003
312501.672	13	6	0	0.00001	0.00001
1015282.865	41	22	1	0.00004	0.00002

Total MT 22.843 0.000927 0.000477

Total CO2E 23.0

One-time in 2026

Construction and Operational Onroad GHG Emissions Calculation

Construction	Activity	Total	CO2e
	Trips	2750	0.2
	VMT	32175	8.0
			31.2
Operations			
Worker	Trips	1260	0.1
	VMT	12600	3.1
Grape Hauling			
	Trips	32	0.0010
	VMT	320	0.3
			3.5

One-time in 2026

Annual starting in 2026

QC check: g Co2e/VMT

770 all onroad

970 construction

249 LDA

790 grape hauling

Operataional GHG Emissions From Crop Mowing

Total Grams			Total Metric Tons		
CO2	CH4	N2O	CO2	CH4	N2O
11994.78816	0.51072	0.10944	0.011995	5.1072E-07	1.0944E-07
			0.012		

Annual starting in 2026

GHG Model Inputs

This sheet sumamrizes construction activty data for offroad and onroad equipment used to quantify GHG emissions

Off-Road Equipment Activity Data

Phase	Equipment	Total hrs	hrs/day	Work Days	HP-Hrs	HP	Source
Veg. Clearing	D8 Dozer	160	8	20	38720	242	CAT C15
	Excavator	80	8	10	24880	311	CAT 336
	Haul Truck	60	8	7.5	5040	84	CalEEmod Default
	Wood Chipper	80	4	20	1200	15	CalEEmod Appendix G
Ripping	D8 Dozer	40	8	5	9680	242	CAT C15
Irrigation Install	Excavator	80	8	10	24880	311	CAT 336
	Backhoe	80	8	10	6720	84	CalEEmod Default

Notes
Equipment list and use hours provided by applicant. Horsepower estimates determined by Ascent.

On-Road Worker Trip Activity Data

	Start	End	Work Days	Workers/day	Trips/day (2 trips/worker)	Trip Length (one- way miles)	Worker VMT	
Phase								
Veg Clearing	1-Apr-25	15-May-25	33	5	330	11.7	3861	per phase
Ripping	16-May-25	1-Jul-25	33	25	1650	11.7	19305	per phase
Irrigation	2-Jul-25	15-Aug-25	33	10	660	11.7	7722	per phase
Erosion	1-Oct-25	15-Oct-25	11	5	110	11.7	1287	per phase
Total					2750		32175	total

Operations	Work Days	Worker/day	Trips/Year	Trip Lenght	VMT/yr
Manager	260	1	520	10	5200
Annual Pruning	14	15	420	10	4200
Annual Harvest	8	20	320	10	3200
Total			1260		12600
Grape Hauling			32	10	320

Notes
Phase duration and workers per phase provided by applicant. Trip length derived from CalEEmod default for Napa County.

Off-Road Equipment Emissions Factors

This sheet is an output from CalEEMod's Appendix G which is used to derive GHG emissions factors for offroad equipment

Table G-11. Statewide Average Annual Offroad Equipment Emission Factors (grams per horsepower-hour)

Equipment	Year	Fuel	Low HP	High HP	CO2	CH4	N2O
Aerial Lifts	2025	Diesel	50	75	527.864	0.021	0.004
Aerial Lifts	2025	Diesel	75	100	528.027	0.021	0.004
Aerial Lifts	2025	Diesel	100	175	527.719	0.021	0.004
Aerial Lifts	2025	Diesel	175	300	527.713	0.021	0.004
Aerial Lifts	2025	Diesel	300	600	527.713	0.021	0.004
Aerial Lifts	2026	Diesel	50	75	527.871	0.021	0.004
Aerial Lifts	2026	Diesel	75	100	527.893	0.021	0.004
Aerial Lifts	2026	Diesel	100	175	527.719	0.021	0.004
Aerial Lifts	2026	Diesel	175	300	527.713	0.021	0.004
Aerial Lifts	2026	Diesel	300	600	527.713	0.021	0.004
Bore/Drill Rigs	2025	Diesel	50	75	497.786	0.020	0.004
Bore/Drill Rigs	2025	Diesel	75	100	522.567	0.021	0.004
Bore/Drill Rigs	2025	Diesel	100	175	530.619	0.022	0.004
Bore/Drill Rigs	2025	Diesel	175	300	525.609	0.021	0.004
Bore/Drill Rigs	2025	Diesel	300	600	521.059	0.021	0.004
Bore/Drill Rigs	2025	Diesel	600	750	530.305	0.022	0.004
Bore/Drill Rigs	2025	Diesel	750	999	526.939	0.021	0.004
Bore/Drill Rigs	2026	Diesel	50	75	504.170	0.020	0.004
Bore/Drill Rigs	2026	Diesel	75	100	525.082	0.021	0.004
Bore/Drill Rigs	2026	Diesel	100	175	529.787	0.021	0.004
Bore/Drill Rigs	2026	Diesel	175	300	525.411	0.021	0.004
Bore/Drill Rigs	2026	Diesel	300	600	521.126	0.021	0.004
Bore/Drill Rigs	2026	Diesel	600	750	531.707	0.022	0.004
Bore/Drill Rigs	2026	Diesel	750	999	526.939	0.021	0.004
Cranes	2025	Diesel	50	75	525.413	0.021	0.004
Cranes	2025	Diesel	75	100	526.436	0.021	0.004
Cranes	2025	Diesel	100	175	528.683	0.021	0.004
Cranes	2025	Diesel	175	300	527.564	0.021	0.004
Cranes	2025	Diesel	300	600	527.585	0.021	0.004
Cranes	2025	Diesel	600	750	527.208	0.021	0.004
Cranes	2025	Diesel	750	999	527.447	0.021	0.004
Cranes	2026	Diesel	50	75	525.501	0.021	0.004
Cranes	2026	Diesel	75	100	526.523	0.021	0.004
Cranes	2026	Diesel	100	175	528.820	0.021	0.004
Cranes	2026	Diesel	175	300	527.563	0.021	0.004
Cranes	2026	Diesel	300	600	527.461	0.021	0.004
Cranes	2026	Diesel	600	750	527.258	0.021	0.004
Cranes	2026	Diesel	750	999	527.133	0.021	0.004
Crawler Tractors	2025	Diesel	50	75	527.857	0.021	0.004
Crawler Tractors	2025	Diesel	75	100	528.471	0.021	0.004
Crawler Tractors	2025	Diesel	100	175	527.479	0.021	0.004
Crawler Tractors	2025	Diesel	175	300	527.288	0.021	0.004
Crawler Tractors	2025	Diesel	300	600	528.093	0.021	0.004
Crawler Tractors	2025	Diesel	600	750	524.386	0.021	0.004
Crawler Tractors	2025	Diesel	750	999	533.878	0.022	0.004
Crawler Tractors	2026	Diesel	50	75	544.396	0.022	0.004
Crawler Tractors	2026	Diesel	75	100	528.629	0.021	0.004
Crawler Tractors	2026	Diesel	100	175	527.281	0.021	0.004
Crawler Tractors	2026	Diesel	175	300	527.271	0.021	0.004
Crawler Tractors	2026	Diesel	300	600	528.096	0.021	0.004
Crawler Tractors	2026	Diesel	600	750	524.705	0.021	0.004
Crawler Tractors	2026	Diesel	750	999	534.142	0.022	0.004
Excavators	2025	Diesel	50	75	527.223	0.021	0.004
Excavators	2025	Diesel	75	100	524.872	0.021	0.004
Excavators	2025	Diesel	100	175	528.086	0.021	0.004
Excavators	2025	Diesel	175	300	528.274	0.021	0.004
Excavators	2025	Diesel	300	600	526.988	0.021	0.004
Excavators	2025	Diesel	600	750	530.428	0.022	0.004
Excavators	2025	Diesel	750	999	534.921	0.022	0.004
Excavators	2026	Diesel	50	75	533.887	0.022	0.004
Excavators	2026	Diesel	75	100	525.128	0.021	0.004
Excavators	2026	Diesel	100	175	527.886	0.021	0.004
Excavators	2026	Diesel	175	300	528.178	0.021	0.004
Excavators	2026	Diesel	300	600	527.153	0.021	0.004
Excavators	2026	Diesel	600	750	530.733	0.022	0.004

Excavators	2026	Diesel	750	999	534.915	0.022	0.004
Forklifts	2025	Diesel	50	75	520.490	0.021	0.004
Forklifts	2025	Diesel	75	100	527.108	0.021	0.004
Forklifts	2025	Diesel	100	175	527.465	0.021	0.004
Forklifts	2025	Diesel	175	300	528.244	0.021	0.004
Forklifts	2025	Diesel	300	600	531.099	0.022	0.004
Forklifts	2025	Diesel	600	750	531.099	0.022	0.004
Forklifts	2025	Diesel	750	999	527.640	0.021	0.004
Forklifts	2026	Diesel	50	75	520.592	0.021	0.004
Forklifts	2026	Diesel	75	100	527.097	0.021	0.004
Forklifts	2026	Diesel	100	175	527.468	0.021	0.004
Forklifts	2026	Diesel	175	300	528.244	0.021	0.004
Forklifts	2026	Diesel	300	600	531.099	0.022	0.004
Forklifts	2026	Diesel	600	750	531.099	0.022	0.004
Forklifts	2026	Diesel	750	999	527.640	0.021	0.004
Graders	2025	Diesel	50	75	544.098	0.022	0.004
Graders	2025	Diesel	75	100	522.945	0.021	0.004
Graders	2025	Diesel	100	175	531.194	0.022	0.004
Graders	2025	Diesel	175	300	527.706	0.021	0.004
Graders	2025	Diesel	300	600	525.708	0.021	0.004
Graders	2025	Diesel	600	750	525.708	0.021	0.004
Graders	2025	Diesel	750	999	528.121	0.021	0.004
Graders	2026	Diesel	50	75	563.142	0.023	0.005
Graders	2026	Diesel	75	100	524.029	0.021	0.004
Graders	2026	Diesel	100	175	530.815	0.022	0.004
Graders	2026	Diesel	175	300	527.697	0.021	0.004
Graders	2026	Diesel	300	600	524.468	0.021	0.004
Graders	2026	Diesel	600	750	524.468	0.021	0.004
Graders	2026	Diesel	750	999	528.121	0.021	0.004
Off-Highway Tractors	2025	Diesel	50	75	526.613	0.021	0.004
Off-Highway Tractors	2025	Diesel	75	100	529.622	0.021	0.004
Off-Highway Tractors	2025	Diesel	100	175	527.455	0.021	0.004
Off-Highway Tractors	2025	Diesel	175	300	527.781	0.021	0.004
Off-Highway Tractors	2025	Diesel	300	600	526.647	0.021	0.004
Off-Highway Tractors	2025	Diesel	600	750	524.144	0.021	0.004
Off-Highway Tractors	2025	Diesel	750	999	527.647	0.021	0.004
Off-Highway Tractors	2026	Diesel	50	75	526.237	0.021	0.004
Off-Highway Tractors	2026	Diesel	75	100	530.185	0.022	0.004
Off-Highway Tractors	2026	Diesel	100	175	527.971	0.021	0.004
Off-Highway Tractors	2026	Diesel	175	300	527.666	0.021	0.004
Off-Highway Tractors	2026	Diesel	300	600	526.897	0.021	0.004
Off-Highway Tractors	2026	Diesel	600	750	524.464	0.021	0.004
Off-Highway Tractors	2026	Diesel	750	999	527.646	0.021	0.004
Off-Highway Trucks	2025	Diesel	50	75	522.493	0.021	0.004
Off-Highway Trucks	2025	Diesel	75	100	530.118	0.022	0.004
Off-Highway Trucks	2025	Diesel	100	175	526.643	0.021	0.004
Off-Highway Trucks	2025	Diesel	175	300	526.221	0.021	0.004
Off-Highway Trucks	2025	Diesel	300	600	528.587	0.021	0.004
Off-Highway Trucks	2025	Diesel	600	750	528.690	0.021	0.004
Off-Highway Trucks	2025	Diesel	750	999	524.321	0.021	0.004
Off-Highway Trucks	2026	Diesel	50	75	536.370	0.022	0.004
Off-Highway Trucks	2026	Diesel	75	100	526.275	0.021	0.004
Off-Highway Trucks	2026	Diesel	100	175	526.869	0.021	0.004
Off-Highway Trucks	2026	Diesel	175	300	526.158	0.021	0.004
Off-Highway Trucks	2026	Diesel	300	600	529.168	0.021	0.004
Off-Highway Trucks	2026	Diesel	600	750	528.767	0.021	0.004
Off-Highway Trucks	2026	Diesel	750	999	523.660	0.021	0.004
Other Construction Equipment	2025	Diesel	50	75	522.348	0.021	0.004
Other Construction Equipment	2025	Diesel	75	100	527.743	0.021	0.004
Other Construction Equipment	2025	Diesel	100	175	526.485	0.021	0.004
Other Construction Equipment	2025	Diesel	175	300	528.599	0.021	0.004
Other Construction Equipment	2025	Diesel	300	600	528.419	0.021	0.004
Other Construction Equipment	2025	Diesel	600	750	528.780	0.021	0.004
Other Construction Equipment	2025	Diesel	750	999	527.554	0.021	0.004
Other Construction Equipment	2026	Diesel	50	75	522.680	0.021	0.004
Other Construction Equipment	2026	Diesel	75	100	527.541	0.021	0.004
Other Construction Equipment	2026	Diesel	100	175	527.138	0.021	0.004
Other Construction Equipment	2026	Diesel	175	300	529.258	0.021	0.004
Other Construction Equipment	2026	Diesel	300	600	528.521	0.021	0.004
Other Construction Equipment	2026	Diesel	600	750	529.144	0.021	0.004

Other Construction Equipment	2026	Diesel	750	999	527.519	0.021	0.004
Other General Industrial Equipment	2025	Diesel	50	75	528.191	0.021	0.004
Other General Industrial Equipment	2025	Diesel	75	100	528.455	0.021	0.004
Other General Industrial Equipment	2025	Diesel	100	175	528.383	0.021	0.004
Other General Industrial Equipment	2025	Diesel	175	300	528.509	0.021	0.004
Other General Industrial Equipment	2025	Diesel	300	600	528.188	0.021	0.004
Other General Industrial Equipment	2025	Diesel	600	750	528.187	0.021	0.004
Other General Industrial Equipment	2025	Diesel	750	999	528.190	0.021	0.004
Other General Industrial Equipment	2026	Diesel	50	75	528.133	0.021	0.004
Other General Industrial Equipment	2026	Diesel	75	100	529.857	0.021	0.004
Other General Industrial Equipment	2026	Diesel	100	175	528.383	0.021	0.004
Other General Industrial Equipment	2026	Diesel	175	300	528.627	0.021	0.004
Other General Industrial Equipment	2026	Diesel	300	600	528.188	0.021	0.004
Other General Industrial Equipment	2026	Diesel	600	750	528.187	0.021	0.004
Other General Industrial Equipment	2026	Diesel	750	999	528.190	0.021	0.004
Other Material Handling Equipment	2025	Diesel	50	75	525.353	0.021	0.004
Other Material Handling Equipment	2025	Diesel	75	100	528.778	0.021	0.004
Other Material Handling Equipment	2025	Diesel	100	175	527.405	0.021	0.004
Other Material Handling Equipment	2025	Diesel	175	300	528.011	0.021	0.004
Other Material Handling Equipment	2025	Diesel	300	600	528.583	0.021	0.004
Other Material Handling Equipment	2025	Diesel	600	750	527.804	0.021	0.004
Other Material Handling Equipment	2025	Diesel	750	999	527.804	0.021	0.004
Other Material Handling Equipment	2026	Diesel	50	75	525.353	0.021	0.004
Other Material Handling Equipment	2026	Diesel	75	100	528.736	0.021	0.004
Other Material Handling Equipment	2026	Diesel	100	175	527.402	0.021	0.004
Other Material Handling Equipment	2026	Diesel	175	300	528.000	0.021	0.004
Other Material Handling Equipment	2026	Diesel	300	600	527.861	0.021	0.004
Other Material Handling Equipment	2026	Diesel	600	750	527.804	0.021	0.004
Other Material Handling Equipment	2026	Diesel	750	999	527.804	0.021	0.004
Pavers	2025	Diesel	50	75	524.498	0.021	0.004
Pavers	2025	Diesel	75	100	526.537	0.021	0.004
Pavers	2025	Diesel	100	175	528.494	0.021	0.004
Pavers	2025	Diesel	175	300	528.337	0.021	0.004
Pavers	2025	Diesel	300	600	527.676	0.021	0.004
Pavers	2025	Diesel	600	750	527.836	0.021	0.004
Pavers	2026	Diesel	50	75	525.253	0.021	0.004
Pavers	2026	Diesel	75	100	525.804	0.021	0.004
Pavers	2026	Diesel	100	175	528.486	0.021	0.004
Pavers	2026	Diesel	175	300	528.275	0.021	0.004
Pavers	2026	Diesel	300	600	527.269	0.021	0.004
Pavers	2026	Diesel	600	750	528.473	0.021	0.004
Paving Equipment	2025	Diesel	50	75	523.953	0.021	0.004
Paving Equipment	2025	Diesel	75	100	527.686	0.021	0.004
Paving Equipment	2025	Diesel	100	175	526.935	0.021	0.004
Paving Equipment	2025	Diesel	175	300	528.599	0.021	0.004
Paving Equipment	2025	Diesel	300	600	527.009	0.021	0.004
Paving Equipment	2025	Diesel	600	750	528.037	0.021	0.004
Paving Equipment	2025	Diesel	750	999	528.095	0.021	0.004
Paving Equipment	2026	Diesel	50	75	526.691	0.021	0.004
Paving Equipment	2026	Diesel	75	100	527.706	0.021	0.004
Paving Equipment	2026	Diesel	100	175	527.529	0.021	0.004
Paving Equipment	2026	Diesel	175	300	528.621	0.021	0.004
Paving Equipment	2026	Diesel	300	600	526.904	0.021	0.004
Paving Equipment	2026	Diesel	600	750	526.629	0.021	0.004
Paving Equipment	2026	Diesel	750	999	528.095	0.021	0.004
Rollers	2025	Diesel	50	75	527.546	0.021	0.004
Rollers	2025	Diesel	75	100	528.034	0.021	0.004
Rollers	2025	Diesel	100	175	527.452	0.021	0.004
Rollers	2025	Diesel	175	300	528.085	0.021	0.004
Rollers	2025	Diesel	300	600	529.722	0.021	0.004
Rollers	2026	Diesel	50	75	527.546	0.021	0.004
Rollers	2026	Diesel	75	100	528.012	0.021	0.004
Rollers	2026	Diesel	100	175	527.368	0.021	0.004
Rollers	2026	Diesel	175	300	528.142	0.021	0.004
Rollers	2026	Diesel	300	600	528.943	0.021	0.004
Rough Terrain Forklifts	2025	Diesel	50	75	529.994	0.021	0.004
Rough Terrain Forklifts	2025	Diesel	75	100	528.726	0.021	0.004
Rough Terrain Forklifts	2025	Diesel	100	175	527.759	0.021	0.004
Rough Terrain Forklifts	2025	Diesel	175	300	528.299	0.021	0.004
Rough Terrain Forklifts	2025	Diesel	300	600	527.807	0.021	0.004

Rough Terrain Forklifts	2025	Diesel	600	750	527.403	0.021	0.004
Rough Terrain Forklifts	2026	Diesel	50	75	530.057	0.022	0.004
Rough Terrain Forklifts	2026	Diesel	75	100	528.889	0.021	0.004
Rough Terrain Forklifts	2026	Diesel	100	175	527.710	0.021	0.004
Rough Terrain Forklifts	2026	Diesel	175	300	527.851	0.021	0.004
Rough Terrain Forklifts	2026	Diesel	300	600	528.219	0.021	0.004
Rough Terrain Forklifts	2026	Diesel	600	750	527.403	0.021	0.004
Rubber Tired Dozers	2025	Diesel	50	75	527.918	0.021	0.004
Rubber Tired Dozers	2025	Diesel	75	100	531.632	0.022	0.004
Rubber Tired Dozers	2025	Diesel	100	175	528.125	0.021	0.004
Rubber Tired Dozers	2025	Diesel	175	300	528.560	0.021	0.004
Rubber Tired Dozers	2025	Diesel	300	600	532.172	0.022	0.004
Rubber Tired Dozers	2025	Diesel	600	750	527.876	0.021	0.004
Rubber Tired Dozers	2026	Diesel	50	75	527.921	0.021	0.004
Rubber Tired Dozers	2026	Diesel	75	100	534.030	0.022	0.004
Rubber Tired Dozers	2026	Diesel	100	175	528.033	0.021	0.004
Rubber Tired Dozers	2026	Diesel	175	300	528.489	0.021	0.004
Rubber Tired Dozers	2026	Diesel	300	600	532.550	0.022	0.004
Rubber Tired Dozers	2026	Diesel	600	750	527.876	0.021	0.004
Rubber Tired Loaders	2025	Diesel	50	75	528.023	0.021	0.004
Rubber Tired Loaders	2025	Diesel	75	100	522.879	0.021	0.004
Rubber Tired Loaders	2025	Diesel	100	175	526.161	0.021	0.004
Rubber Tired Loaders	2025	Diesel	175	300	526.675	0.021	0.004
Rubber Tired Loaders	2025	Diesel	300	600	527.135	0.021	0.004
Rubber Tired Loaders	2025	Diesel	600	750	526.188	0.021	0.004
Rubber Tired Loaders	2025	Diesel	750	999	529.003	0.021	0.004
Rubber Tired Loaders	2026	Diesel	50	75	528.023	0.021	0.004
Rubber Tired Loaders	2026	Diesel	75	100	523.446	0.021	0.004
Rubber Tired Loaders	2026	Diesel	100	175	526.415	0.021	0.004
Rubber Tired Loaders	2026	Diesel	175	300	526.593	0.021	0.004
Rubber Tired Loaders	2026	Diesel	300	600	527.198	0.021	0.004
Rubber Tired Loaders	2026	Diesel	600	750	526.611	0.021	0.004
Rubber Tired Loaders	2026	Diesel	750	999	529.048	0.021	0.004
Scrapers	2025	Diesel	50	75	531.265	0.022	0.004
Scrapers	2025	Diesel	75	100	530.077	0.022	0.004
Scrapers	2025	Diesel	100	175	531.820	0.022	0.004
Scrapers	2025	Diesel	175	300	527.149	0.021	0.004
Scrapers	2025	Diesel	300	600	528.942	0.021	0.004
Scrapers	2025	Diesel	600	750	527.905	0.021	0.004
Scrapers	2025	Diesel	750	999	527.722	0.021	0.004
Scrapers	2026	Diesel	50	75	528.761	0.021	0.004
Scrapers	2026	Diesel	75	100	529.585	0.021	0.004
Scrapers	2026	Diesel	100	175	531.008	0.022	0.004
Scrapers	2026	Diesel	175	300	527.080	0.021	0.004
Scrapers	2026	Diesel	300	600	528.854	0.021	0.004
Scrapers	2026	Diesel	600	750	527.106	0.021	0.004
Scrapers	2026	Diesel	750	999	527.722	0.021	0.004
Skid Steer Loaders	2025	Diesel	50	75	528.374	0.021	0.004
Skid Steer Loaders	2025	Diesel	75	100	528.023	0.021	0.004
Skid Steer Loaders	2025	Diesel	100	175	527.077	0.021	0.004
Skid Steer Loaders	2025	Diesel	175	300	528.013	0.021	0.004
Skid Steer Loaders	2025	Diesel	300	600	528.537	0.021	0.004
Skid Steer Loaders	2025	Diesel	600	750	528.537	0.021	0.004
Skid Steer Loaders	2025	Diesel	750	999	527.040	0.021	0.004
Skid Steer Loaders	2026	Diesel	50	75	528.621	0.021	0.004
Skid Steer Loaders	2026	Diesel	75	100	528.023	0.021	0.004
Skid Steer Loaders	2026	Diesel	100	175	528.071	0.021	0.004
Skid Steer Loaders	2026	Diesel	175	300	528.075	0.021	0.004
Skid Steer Loaders	2026	Diesel	300	600	528.537	0.021	0.004
Skid Steer Loaders	2026	Diesel	600	750	528.537	0.021	0.004
Skid Steer Loaders	2026	Diesel	750	999	527.040	0.021	0.004
Surfacing Equipment	2025	Diesel	50	75	530.261	0.022	0.004
Surfacing Equipment	2025	Diesel	75	100	532.453	0.022	0.004
Surfacing Equipment	2025	Diesel	100	175	528.391	0.021	0.004
Surfacing Equipment	2025	Diesel	175	300	528.396	0.021	0.004
Surfacing Equipment	2025	Diesel	300	600	527.121	0.021	0.004
Surfacing Equipment	2025	Diesel	600	750	527.646	0.021	0.004
Surfacing Equipment	2025	Diesel	750	999	527.980	0.021	0.004
Surfacing Equipment	2026	Diesel	50	75	530.215	0.022	0.004
Surfacing Equipment	2026	Diesel	75	100	532.222	0.022	0.004

Surfacing Equipment	2026	Diesel	100	175	527.796	0.021	0.004
Surfacing Equipment	2026	Diesel	175	300	528.804	0.021	0.004
Surfacing Equipment	2026	Diesel	300	600	527.817	0.021	0.004
Surfacing Equipment	2026	Diesel	600	750	526.986	0.021	0.004
Surfacing Equipment	2026	Diesel	750	999	527.948	0.021	0.004
Sweepers/Scrubbers	2025	Diesel	50	75	525.363	0.021	0.004
Sweepers/Scrubbers	2025	Diesel	75	100	527.853	0.021	0.004
Sweepers/Scrubbers	2025	Diesel	100	175	528.031	0.021	0.004
Sweepers/Scrubbers	2025	Diesel	175	300	528.031	0.021	0.004
Sweepers/Scrubbers	2025	Diesel	300	600	528.031	0.021	0.004
Sweepers/Scrubbers	2025	Diesel	600	750	528.031	0.021	0.004
Sweepers/Scrubbers	2025	Diesel	750	999	528.031	0.021	0.004
Sweepers/Scrubbers	2026	Diesel	50	75	525.912	0.021	0.004
Sweepers/Scrubbers	2026	Diesel	75	100	527.890	0.021	0.004
Sweepers/Scrubbers	2026	Diesel	100	175	528.031	0.021	0.004
Sweepers/Scrubbers	2026	Diesel	175	300	528.031	0.021	0.004
Sweepers/Scrubbers	2026	Diesel	300	600	528.031	0.021	0.004
Sweepers/Scrubbers	2026	Diesel	600	750	528.031	0.021	0.004
Sweepers/Scrubbers	2026	Diesel	750	999	528.031	0.021	0.004
Tractors/Loaders/Backhoes	2025	Diesel	50	75	527.224	0.021	0.004
Tractors/Loaders/Backhoes	2025	Diesel	75	100	529.863	0.021	0.004
Tractors/Loaders/Backhoes	2025	Diesel	100	175	525.997	0.021	0.004
Tractors/Loaders/Backhoes	2025	Diesel	175	300	526.844	0.021	0.004
Tractors/Loaders/Backhoes	2025	Diesel	300	600	525.863	0.021	0.004
Tractors/Loaders/Backhoes	2025	Diesel	600	750	503.925	0.020	0.004
Tractors/Loaders/Backhoes	2025	Diesel	750	999	528.147	0.021	0.004
Tractors/Loaders/Backhoes	2026	Diesel	50	75	527.604	0.021	0.004
Tractors/Loaders/Backhoes	2026	Diesel	75	100	529.707	0.021	0.004
Tractors/Loaders/Backhoes	2026	Diesel	100	175	526.226	0.021	0.004
Tractors/Loaders/Backhoes	2026	Diesel	175	300	527.587	0.021	0.004
Tractors/Loaders/Backhoes	2026	Diesel	300	600	526.330	0.021	0.004
Tractors/Loaders/Backhoes	2026	Diesel	600	750	515.505	0.021	0.004
Tractors/Loaders/Backhoes	2026	Diesel	750	999	527.971	0.021	0.004
Trenchers	2025	Diesel	50	75	522.319	0.021	0.004
Trenchers	2025	Diesel	75	100	530.152	0.022	0.004
Trenchers	2025	Diesel	100	175	527.186	0.021	0.004
Trenchers	2025	Diesel	175	300	529.781	0.021	0.004
Trenchers	2025	Diesel	300	600	529.637	0.021	0.004
Trenchers	2025	Diesel	600	750	527.929	0.021	0.004
Trenchers	2025	Diesel	750	999	528.023	0.021	0.004
Trenchers	2026	Diesel	50	75	524.655	0.021	0.004
Trenchers	2026	Diesel	75	100	529.355	0.021	0.004
Trenchers	2026	Diesel	100	175	526.909	0.021	0.004
Trenchers	2026	Diesel	175	300	527.799	0.021	0.004
Trenchers	2026	Diesel	300	600	529.258	0.021	0.004
Trenchers	2026	Diesel	600	750	527.846	0.021	0.004
Trenchers	2026	Diesel	750	999	528.023	0.021	0.004

Landscape Equipment Emissions Factors

This sheet is an output from CalEEMod's Appendix G which is used to derive GHG emissions factors for landscape equipment

Table G-26. Statewide Average Annual Landscape Equipment Emission Factors (grams per horsepower-hour)

Landscape Equipment	Land Use Type	Year	Fuel	Low HP	High HP	CO2	CH4	N2O
Chippers/Stump Grinders/Shredder Preempt	Residential	2025	Gasoline 4-Stroke	0	2	644.02	0.03	0.01
Chippers/Stump Grinders/Shredder Preempt	Residential	2025	Gasoline 4-Stroke	2	5	644.02	0.03	0.01
Chippers/Stump Grinders/Shredder Preempt	Residential	2025	Gasoline 4-Stroke	5	15	620.04	0.03	0.01
Lawn Mowers	Non-residential	2025	Gasoline 4-Stroke	0	2	693.15	0.03	0.01
Lawn Mowers	Non-residential	2025	Gasoline 4-Stroke	2	5	693.42	0.03	0.01
Lawn Mowers	Non-residential	2025	Gasoline 4-Stroke	5	15	657.61	0.03	0.01
Lawn Mowers	Non-residential	2025	Gasoline 4-Stroke	15	25	657.61	0.03	0.01
Lawn Mowers	Residential	2025	Gasoline 4-Stroke	0	2	693.15	0.03	0.01
Lawn Mowers	Residential	2025	Gasoline 4-Stroke	2	5	693.42	0.03	0.01
Lawn Mowers	Residential	2025	Gasoline 4-Stroke	5	15	657.61	0.03	0.01
Lawn Mowers	Residential	2025	Gasoline 4-Stroke	15	25	657.61	0.03	0.01

*Yellow columns include idles and starts, which are calculated on a per-trip basis.

Operati onal Year	Vehicle Type	TOG RUNEX (g/mi)	TOG IDLEX (g/trip)	TOG STREX (g/trip)	TOG DIURN (g/trip)	TOG HOTS OAK (g/trip)	TOG RUNL OSS (g/trip)	ROG RUNE X (g/mi)	ROG IDLEX (g/trip)	ROG STREX (g/trip)	ROG DIURN (g/trip)	ROG HOTS OAK (g/trip)	ROG RUNL OSS (g/trip)	NOx RUNE X (g/mi)	NOx IDLEX (g/trip)	NOx STREX (g/trip)	CO RUNE X (g/mi)	CO IDLEX (g/trip)	CO STREX (g/trip)	SOx RUNE X (g/mi)	SOx IDLEX (g/trip)	SOx STREX (g/trip)	PM2.5 RUNE X (g/mi)	PM2.5 IDLEX (g/trip)	PM2.5 STREX (g/trip)	PM2.5 PMTW (g/mi)	PM2.5 PMBW (g/mi)	PM10 RUNE X (g/mi)	PM10 IDLEX (g/trip)	PM10 STREX (g/trip)	PM10 PMTW (g/mi)	PM10 PMBW (g/mi)	CO RUNEX (g/mi)	CO IDLEX (g/trip)	CO STREX (g/trip)	CH RUNEX (g/mi)	CH IDLEX (g/trip)	CH STREX (g/trip)	N O RUNEX (g/mi)	N O IDLEX (g/trip)	N O STREX (g/trip)	Total per trip emissions (g CO2/trip)	Total per trip emissions (g CH4/trip)	Total per trip emissions (g N2O/trip)
2025	HHDT	0.085	0.53	0	-	-	-	0.02	0.269	0	-	-	-	1.916	3.83	2.786	0.499	4.292	0.003	0.015	0.006	0	0.024	0.003	0	0.009	0.028	0.025	0.003	0	0.035	0.081	1606.186	718.159	0.038	0.063	0.236	0	0.256	0.117	0	718.197	0.236	0.117
2025	LDA	0.011	0	0.343	0.307	0.088	0.158	0.008	0	0.313	0.307	0.088	0.158	0.038	0	0.243	0.648	0	3.107	0.002	0	0.001	0.001	0	0.002	0.002	0.003	0.001	0	0.002	0.008	0.008	247.931	0	65.553	0.002	0	0.069	0.004	0	0.032	65.553	0.069	0.032
2025	LDT1	0.044	0	0.743	0.782	0.212	0.448	0.03	0	0.679	0.782	0.212	0.448	0.146	0	0.459	1.531	0	6.629	0.003	0	0.001	0.002	0	0.003	0.002	0.003	0.002	0	0.003	0.008	0.01	326.585	0	90.117	0.007	0	0.128	0.011	0	0.043	90.117	0.128	0.043
2025	LDT2	0.015	0	0.438	0.322	0.088	0.19	0.01	0	0.4	0.322	0.088	0.19	0.066	0	0.341	0.812	0	3.833	0.003	0	0.001	0.001	0	0.002	0.002	0.003	0.001	0	0.002	0.008	0.009	335.951	0	87.336	0.003	0	0.086	0.006	0	0.038	87.336	0.086	0.038
2025	LHDT1	0.168	0.027	0.114	0.132	0.033	0.122	0.139	0.019	0.105	0.132	0.033	0.122	1.246	0.087	0.384	1.062	0.186	1.753	0.008	0	0	0.025	0.001	0	0.002	0.027	0.026	0.001	0	0.01	0.078	774.364	9.402	14.472	0.011	0.004	0.021	0.055	0.001	0.029	23.874	0.025	0.03
2025	LHDT2	0.19	0.018	0.058	0.069	0.017	0.06	0.163	0.014	0.053	0.069	0.017	0.06	1.396	0.129	0.203	0.74	0.119	0.882	0.008	0	0	0.033	0.002	0	0.003	0.032	0.035	0.002	0	0.011	0.081	833.898	15.159	7.54	0.01	0.002	0.011	0.095	0.002	0.015	22.699	0.013	0.017

Equipment Load Factors

This sheet is an output from CalEEMod's Appendix G which is used to obtain equipment load factors to derive GHG emissions factor

Table G-12. Horsepower and Load Factors for Construction Equipment by Fuel Type

Equipment	Fuel	Horsepower	Load Factor
Aerial Lifts	Diesel	46	0.31
Air Compressors	Diesel	37	0.48
Bore/Drill Rigs	Diesel	83	0.50
Cement and Mortar Mixers	Diesel	10	0.56
Concrete/Industrial Saws	Diesel	33	0.73
Cranes	Diesel	367	0.29
Crawler Tractors	Diesel	87	0.43
Dumpers/Tenders	Diesel	16	0.38
Excavators	Diesel	36	0.38
Forklifts	Diesel	82	0.20
Generator Sets	Diesel	14	0.74
Graders	Diesel	148	0.41
Off-Highway Tractors	Diesel	38	0.44
Off-Highway Trucks	Diesel	376	0.38
Other Construction Equipment	Diesel	82	0.42
Other General Industrial Equipment	Diesel	35	0.34
Other Material Handling Equipment	Diesel	93	0.40
Pavers	Diesel	81	0.42
Paving Equipment	Diesel	89	0.36
Plate Compactors	Diesel	8	0.43
Pressure Washers	Diesel	14	0.30
Pumps	Diesel	11	0.74
Rollers	Diesel	36	0.38
Rough Terrain Forklifts	Diesel	96	0.40
Rubber Tired Dozers	Diesel	367	0.40
Rubber Tired Loaders	Diesel	150	0.36
Scrapers	Diesel	423	0.48
Signal Boards	Diesel	6	0.82
Skid Steer Loaders	Diesel	71	0.37
Surfacing Equipment	Diesel	399	0.30
Sweepers/Scrubbers	Diesel	36	0.46
Tractors/Loaders/Backhoes	Diesel	84	0.37
Trenchers	Diesel	40	0.50
Welders	Diesel	46	0.45

Cover Crops- COMET Planner

Calculated weighted average sequestration rate for cover crops and mulching, MT CO2e / acre / year

Plant	Type	Seeding Rate (lbs/acre)	Carbon Sequestration Rate (MT CO2e / year)
Dwarf Barley	Grass	50	1.067
Blando Brome	Grass	8	1.067
Zorro Fescue	Grass	12	1.067
Crimson Clover	Legume	6	1.638

Weighted Average sequestration rate for cover crops	Average sequestration rate for mulching
1.112078947	0.341

https://comet-planner-cdfahsp.com/
ECP

A permanent cover crop strategy will be utilized. The permanent cover crop will be generated the first year by seeding with the following mix: Dwarf Barley at 50 lbs/acre, Blando Brome at 8 lbs/acre, Zorro Fescue at 12 lbs/acre, and Crimson Clover at 6 lbs/acre. A pre-approved alternative seed mix may be allowed.

Straw mulch shall be applied to all disturbed areas at a rate of 3,000 lbs/acre prior to October 15 of the year of construction.

NRCS Conservation Practices		Unit Value (acres or feet)	Carbon Dioxide	Nitrous Oxide	Methane	Total CO2 Equivalent	Estimated Payment*
	Add Mulch to Orchard/Vineyards - Natural Materials ⓘ	1000 Acre(s)	528	-187	--	341	\$1,074,960
	Add Legume/Legume Mix Cover Crop to Orchard/Vineyard Alleys - Basic (Organic and Non-organic) ⓘ	1000 Acre(s)	1,692	-54	--	1,638	\$308,940
	Add Non-Legume Cover Crop to Orchard/Vineyard Alleys - Basic (Organic and Non-organic) ⓘ	1000 Acre(s)	1,057	10	--	1,067	\$308,940
	Conventional Till to No Till in Orchard/Vineyard Alleys - No-till or Strip-till ⓘ	1000 Acre(s)	319	25	--	344	\$95,160
	Compost (C/N < or = 11) Application to Orchards or Vineyards, Purchased from a certified composting facility - 2 tons/acre ⓘ	1000 Acre(s)	1,685	-156	2	1,531	\$300,000
Totals			5,281	-362	2	4,921	\$2,088,000
Estimated Payment Cannot exceed \$100,000							*Download  Clear All

Soil Loss

Transect	Acres	Percent Ground Cover	Weighted average percent ground cover
1A	1.24	70%	70%
1B	0.27	70%	
2	1.01	70%	
3	2.49	80%	
4A	0.63	70%	
4B	0.55	70%	
5A	0.79	60%	
5B	1.26	60%	
6A	1.77	70%	
6B	2.39	70%	
6/7	0.07	70%	
7	0.34	70%	
8	1.06	70%	
9A	0.80	70%	
9B	0.73	70%	
9C	0.83	70%	
9/10	0.07	70%	
10	0.37	70%	

Trees/Acre Parameters

Project Data			
Item	Quantity	Source	Notes
Acres of land cleared	16.7	Proposed Clearing Limits (extracted from GIS files); also mentioned in Supplemental Project Info (link below) Supplemental Project Info	
Acres of vineyard planted	13.1		
Acres of Coast Live Oak Removed	13.28	BRRS	The Project Area currently contains 13.28 acres of oak woodland . . . The dominant tree is coast live oak (Quercus agrifolia), with scattered cover of California black oak (Quercus kelloggii), blue oak (Q. douglasii), and California bay (Umbellularia californica).
Vines per acre	2,833	RFI Response	ossible vines/acre values given: - 13.1 acres at either 1x1 meter (~4,000 vines/acre) or 1.5x1 meter (~2,700 vines/acre) or 1.5X1.5 meter (~1,800 vines/acre)
Start Year For Clearing And Planting	2026	Assumption; assumes clearing and existing vegetation starts in 2025	
MT CO2 per MT C	3.67	Conversion factor	The molecular weight of carbon (C) is approximately 12 grams per mole. The molecular weight of carbon dioxide (CO2) is approximately 44 grams per mole.
Metric Tons per Short Ton	0.907186	Conversion factor	
Acres of woodland retained	31.3	BRRS	The Project Area currently contains 13.28 acres of oak woodland in total and thus 31.13 acres of this oak woodland will be retained.