Quercus Group

Forest & Greenhouse Gas Consultants
a division of Horizon Forest Products
P.O. Box 5325 / Richmond, CA 94805
510/236-0924 / QuercusGrp@sbcglobal.net

January 15, 2017

San Francisco Board of Supervisors
1 Dr. Carlton B. Goodlett Place
City Hall, Room 244
San Francisco, Ca. 94102-4689

Re: Planning Case No. 205.1912E SNRAMP

Board Members:

The Quercus Group appreciates the opportunity to submit Significant Natural Resource Areas Management Plan EIR comments on behalf of the San Francisco Forest Alliance. We incorporate by reference the Alliance forest comments of November 27, 2016.

Review of the EIR finds that the project fails to comprehensively analyze or feasibly and proportionally mitigate terrestrial conversion vegetation and soil organic matter direct/indirect[1] greenhouse gas (GHG) emissions pursuant to California Environmental Quality Act (CEQA) requirements. Specifically, the failure to fully account for the foreseeable carbon dioxide (CO_2) and methane (CH_4) emission effects due to biomass disposal decomposition (Exhibit A) and soil disturbance. These EIR omissions represent a failure to proceed in the manner prescribed by CEQA.

Forest Resources Conversion Greenhouse Gas Emissions
The limitations of the Intergovernmental Panel on Climate Change (IPCC) generic vegetation land use change general default standards were clearly demonstrated in the excellent Forest Alliance comments. The California Emissions Estimator Model (CalEEMod) used for the EIR GHG biogenic emissions analysis employs IPCC forest general defaults that are unrelated to actual California forest carbon stocking conditions (CalEEMod, Appendix A, pp. 51, 52). This one size fits all approach does not reflect California's diverse forests resources and fails to account for CEQA site-specific forest conversion requirements or other pertinent California GHG policies/laws (Exhibit B). In fact the only IPCC general default standards relevant to California forest resources are the international GHG global warming potential (GWP) values established by the 2013 IPCC Fifth Assessment Report.

CEQA § 15364.5 states that "Greenhouse gas" or "greenhouse gases" includes but is not limited to: carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride. In 2016 Senate Bill 1383 designated methane a short-lived climate "super" pollutant.[2] Neither the 2009 CEQA GHG amendments nor the enabling legislation Senate Bill 97 mention the term "carbon sequestration." CEQA's focus is "*the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions*." Further, the EIR must explain how the terrestrial conversion mitigation proposals result in less than significant GHG emissions consistent with state 2020, 2030 and 2050 GHG reduction targets.

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[1] CEQA recognizes these secondary GHG biogenic emissions in the indirect effects language of Guidelines § 15358(2), "... are later in time or farther removed in distance, but are still reasonably foreseeable."

[2] SB 1383 requires a 40 percent statewide reduction in methane emissions from 2013 levels by 2030.

Upon the disposal of impacted vegetation, the decomposition of biomass does in all cases result in CO_2 and CH_4 biogenic emissions.[3] CEQA doesn't differentiate between anthropogenic and biogenic GHG emissions. The following 2009 Natural Resources Agency response to the California Wastewater Climate Change Group proves the point:

Response 95-1: "Regarding the comment that the Guidelines should distinguish between anthropogenic and biogenic carbon dioxide emissions, the Natural Resources Agency notes that SB 97 did not distinguish between the sources of greenhouse gas emissions. Thus, it would not be appropriate for the Natural Resources Agency to treat the different categories of emissions differently absent a legislative intent that the Guidelines do so. Neither AB 32 nor the Air Resources Board's Scoping Plan distinguishes between biogenic and anthropogenic sources of greenhouse gas emissions. On the contrary, the Scoping Plan identifies methane from, among other sources, organic wastes decomposing in landfills as a source of emissions that should be controlled. (Scoping Plan, at pp. 62-63)."

AB 32 defines carbon dioxide equivalent (CO_2e) to mean, "... the amount of carbon dioxide by weight that would produce the same global warming impact as a given weight of another greenhouse gas, based on the best available science, including from the Intergovernmental Panel on Climate Change."

"The IPCC released its Fifth Assessment Report (AR5) in 2013, including scientific research and conclusions regarding current GHG global warming potential (GWP) values for determining CO_2e. The IPCC recommends using the AR5 GWP values, as they reflect the best information on global warming potentials. The Air District is using the GWP values from AR5, which include a GWP for methane (including all feedback effects) of 34. We recommend that ARB also use GWPs from AR5 in the Strategy."[4] Consistent with the AB 32 carbon dioxide equivalent definition, the Bay Area Air Quality Management District uses the GWP values from AR5.

CalEEMod Model Methodology
The CalEEMod model is used for project forest conversion GHG biogenic emissions analysis. Like all publicly available forest conversion models the CalEEMod measures only the carbon loss (emission) or carbon gain (sequestration). The CalEEMod was not designed to calculate vegetation methane biogenic emissions due to biomass decomposition. The California Air Pollution Control Officers Association have never claimed their model has that capability regarding forest resources conversion GHG biogenic emissions analysis.

Other flawed aspects of the forest resources GHG biogenic emissions analysis include:

•   "IPCC Good practice Guidance for Land Use and Forestry (2003) applies a 20 year window for calculating positive sequestration from trees" (Appendix B).

The cited IPCC standard is antiquated, pre-dating California's development of extensive GHG policy and law. Both forest resources and GHG biogenic emissions are analyzed over a standard one-hundred year planning horizon. The assertion that trees are limited to a 20 year positive carbon sequestration window is baseless and the EIR provides no science or fact to support this speculative opinion. In fact planted native oak trees don't attain appreciable carbon sequestration until about 20 years of age.

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[3] "Anaerobic digestion, chemical process in which organic matter is broken down by microorganisms in the absence of oxygen, which results in the generation of carbon dioxide (CO_2) and methane (CH_4) .... Sugars, starches, and cellulose produce approximately equal amounts of methane and carbon dioxide." Encyclopædia Britannica (2016). http://www.britannica.com/EBchecked/topic/22310/anaerobic-digestion.

[4] BAAQMD May 26, 2016 letter from Jack P. Broadbent, Executive Officer/APCO to Richard Corey, Executive Officer, California Air Resources Board regarding ARB Short-Lived Climate Pollutants Strategy.

- The CalEEMod uses a IPCC forest general default of 111 metric tonnes (MT) of CO_2e emissions per acre.

Dividing 111 MT CO_2e by 3.67 yields 30 MT biomass/soil carbon sequestration per acre. Based on the age and density of the forest this figure substantially underestimates the carbon sequestration stocking per acre values of the thousands of large trees to be removed. Actual non-plantation eucalyptus aboveground biomass carbon sequestration stocks are $\pm$60 MT C/acre and 0.4 MT C/acre-year. According to the latest literature eucalyptus soil carbon stocks are as high as 50 MT C/acre.

- "At the end of the 20 year horizon window of the SNRAMP, there would be a calculated net gain of sequestration of approximately 388 MT of CO_2 per year. The primary contributing factor to this sequestration gain would be the removal of an aging eucalyptus tree population which would be replaced with much more efficiently sequestering tree and plant growth" (Appendix B).

The EIR does not stipulate that new planted trees will be a mitigation measure. Nor does it provide data on the species/number of planted trees required to reduce GHG biogenic emission impacts consistent with state 2020, 2030 and 2050 reduction goals. Essentially the EIR is falsely claiming that the existing forest carbon sequestration capacity will be more than replaced by the grassland sequestration. Quercus Group suggests the EIR preparers query the USDA Forest Service or CALFIRE regarding the veracity of this assertion.

- The SNRAMP defines a Tree as a tree having a dominant vertical trunk greater than 15 feet tall. Smaller trees are considered "Saplings" (EIR at 92).

The thousands of EIR uncounted "saplings," which under the plan may be removed, would replace the "aging eucalyptus tree population" over time and sequester significantly more carbon, much faster than grassland.

To accurately and fully account for forest conversion GHG biogenic emissions the total biomass weight or total biomass carbon weight of the impacted overstory/understory vegetation must be known, the means of vegetation disposal identified and the soil organic matter emissions calculated.

- Please provide the following forest resources information:

1. What is the estimated total biomass weight or total biomass carbon weight of all the impacted vegetation?

2. What are the estimated biomass decomposition CO_2 and CH_4 emissions?

3. What are the estimated soil organic matter CO_2 biogenic emissions associated with ground disturbing activities?[5]

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[5] Soil organic matter (SOM) is the organic matter component of soil, consisting of plant and animal residues at various stages of decomposition, cells and tissues of soil organisms, and substances synthesized by soil organisms. The SOM carbon sequestration zone extends to a depth of 1 meter.

The EIR provides no science or fact to support how its potential mitigation measures are going to actually mitigate the project's dual impacts of lost forest carbon sequestration capacity *and* significant biomass disposal/soil disturbance GHG biogenic emissions.

• Please provide the following forest resources mitigation information:

1. Demonstrate mathematically how the proposed measures will mitigate the CO_2 and CH_4 biogenic emissions due to the decomposition of the impacted biomass.

2. Demonstrate mathematically how the proposed measures will mitigate the soil organic matter CO_2 biogenic emissions associated with ground disturbing activities.

3. Explain how the proposed mitigation is consistent with SB 1383 2030 reduction requirements regarding methane emissions.

4. Explain how the non-tree planting migration measures are consistent with reducing GHG emissions statewide 80 percent by 2050.

Wetlands are major carbon sinks. Impacted wetlands carbon sequestration rates can take decades or longer to replicate through replacement mitigation. In general, Ambrose et al. (2007) found that the primary state and federal wetland protection programs have been generating more wetlands of lower quality than the wetlands they allowed to be destroyed. The EIR proposes the conversion of freshwater marsh, willow scrub and wet meadow wetland habitat to open water habitat.

• Please provide the following wetlands conversion information:

1. What are the estimated CO_2 and CH_4 biogenic emissions associated with impacts to all project area wetland classifications, including the dredging of up to 60,000 cubic yards of "material"?

2. What is the estimated carbon sequestration rate (i.e. metric tonnes carbon per acre per year) for the wetland classifications replacement mitigation?

3. Explain how the proposed mitigation is consistent with SB 1383 2030 reduction requirements regarding methane emissions.

Summary
The 2008 California Air Resources Board's AB 32 Scoping Plan recognized the significant contribution that terrestrial greenhouse gas storage will make in meeting the state's GHG emissions reduction goals: "This plan also acknowledges the important role of terrestrial sequestration in our forests, rangelands, wetlands, and other land resources." The EIR perpetuates the myth that forest and other terrestrial conversion GHG emissions are simply an issue of carbon transformed to carbon dioxide. This fallacy belies the fact that potentially four other GHGs are involved, including the super pollutant methane. The constant among court decisions regarding GHG analysis is that project emissions must be accurately and fully rendered in a CEQA document. This EIR appears designed to obfuscate and minimize project GHG biogenic emissions, rather than a bona fide attempt to comply with CEQA's focus of ascertaining the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions.

Substantial evidence has been presented that project GHG biogenic emissions will result in potentially significant environmental effects that have not been sufficiently analyzed or feasibly mitigated. The project has not made "a good-faith effort, based to the extent possible on scientific and factual data, to describe, calculate or estimate the amount of greenhouse gas emissions resulting from a project" (CEQA Guidelines § 15064.4(a)). Therefore the EIR is deficient as an informational document, in that it fails to apprise decision-makers/public of the full range and intensity of the adverse GHG emission effects on the environment that may reasonably be expected if the project is approved.

Sincerely,

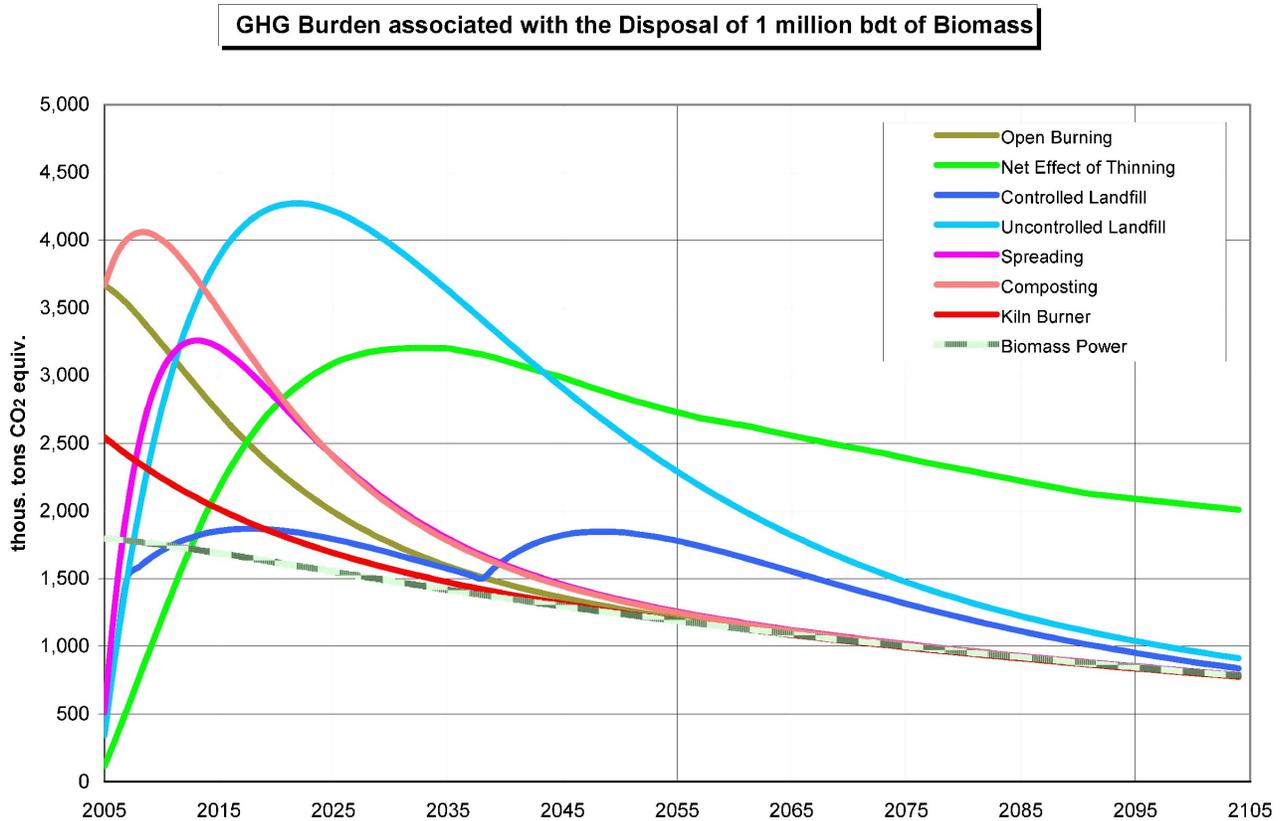Ron Cowan, Principal

attachments (3)

Exhibit A

Biomass Disposal Greenhouse Gas Emissions

The following chart illustrates the relative GHG indirect biogenic emission effects from common methods of vegetation (biomass) disposal.[1] The biomass combustion GHG emission values do no include black carbon emissions.

Uncontrolled landfill disposal produces the greatest biomass GHG biogenic emissions followed by composting, open burning, mulching, forest thinning, controlled landfills and biomass power. The chart demonstrates that peak greenhouse gas emissions vary substantially depending on the means of biomass disposal, with the higher peaks reflecting increased amounts of methane and/or nitrous oxide emissions.

Terminology: Net effect of thinning emissions apply to forest thinning emissions and spreading emissions are equivalent to mulching emissions.

GHG Burden associated with the Disposal of 1 million bdt of Biomass

Legend:
- Open Burning
- Net Effect of Thinning
- Controlled Landfill
- Uncontrolled Landfill
- Spreading
- Composting
- Kiln Burner
- Biomass Power

y-axis: thous. tons CO2 equiv.

Graphic: Gregory Morris, PhD. *Bioenergy and Greenhouse Gases.* Published by Pacific Institute (2008).

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[1] One bone dry ton (bdt) is a volume of wood chips (or other bulk material) that would weigh one ton (2000 pounds, or 0.9072 metric tons) if all the moisture content was removed.

Terrestrial Conversion Greenhouse Gas Emissions

Policy and Regulatory Framework
The following policy and regulatory background information provides context to the importance of reducing and feasibly mitigating terrestrial conversion greenhouse gas (GHG) biogenic emission effects:

Governor Brown
"We must also reduce the relentless release of methane, black carbon and other potent pollutants across industries. And we must manage farm and rangelands, forests and wetlands so they can store carbon." – January 2015 inaugural address regarding the state's greenhouse gas reduction goals for the next 15 years.

California Air Resources Board
"California is committed to reducing emissions of CO_2, which is the most abundant greenhouse gas and drives long-term climate change. However, short-lived climate pollutants [methane, black carbon, etc.] have been shown to account for 30-40 percent of global warming experienced to date. Immediate and significant reduction of both CO_2 and short-lived climate pollutants is needed to stabilize global warming and avoid catastrophic climate change." *Reducing Short-Lived Climate Pollutants in California, 2014.*

Assembly Bill 32
Signed by Governor Schwarzenegger on Setember 27, 2006. This statute requires a statewide GHG emissions limit equivalent to the statewide greenhouse gas emissions levels in 1990 to be achieved by 2020.

Senate Bill 97
Signed by Governor Schwarzenegger on August 24, 2007. This statute required that the Office of Planning and Research prepare CEQA guidelines for evaluating the effects of GHG emissions and for mitigating such effects. The Natural Resources Agency adopted these guidelines on December 31, 2009.

Senate Bill 32
Signed by Governor Brown on September 8, 2016. This statute requires that statewide GHG emissions be reduced to 40% below the 1990 level by 2030.

Senate Bill 1383
Signed by Governor Brown on September 19, 2016. This statute requires a 50 percent statewide reduction in black carbon emissions and a 40 percent reduction in methane and hydrofluorocarbon emissions from 2013 levels by 2030.

Executive Order S-3-05
Signed by Governor Schwarzenegger on June 1, 2005. Executive Order S-3-05 established a California GHG reduction target of 80 percent below 1990 levels by 2050.

Phoenix Energy
"As wood starts to decompose it releases roughly equal amounts of methane (CH_4) and carbon dioxide (CO_2)." 2014. http://www.phoenixenergy.net/powerplan/environment

Macpherson Energy Corporation
"Rotting produces a mixture of up to 50 percent CH_4, while open burning produces 5 to 10 percent CH_4." 2014. http://macphersonenergy.com/mt-poso-conversion.html

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