## *Attachment 1: Description of Emission Reduction Measure Form*

*Please fill out one form for each emission reduction measure. See instructions in Attachment 2.*

**Title: Active Management of California's Forest Service National Forestlands**

**Type of Measure (check all that apply):**

- ☐ Direct Regulation
- ☐ Market-Based Compliance
- ☐ Monetary Incentive
- ☐ Non-Monetary Incentive
- ☒ Voluntary
- ☐ Alternative Compliance Mechanism
- ☐ Other Describe:

**Responsible Agency: ARB**

**Sector:**

- ☐ Transportation
- ☐ Electricity Generation
- ☐ Other Industrial
- ☐ Refineries
- ☐ Agriculture
- ☐ Cement
- ☒ Sequestration
- ☒ Other Describe: **Substitution and Biomass Offsets**

**2020 Baseline Emissions Assumed (MMT CO2E): -16**

**Percent Reduction in 2020: 400**

**Cost-Effectiveness ($/metric ton CO2E) in 2020: 0**

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**Description:** 18 million tons of CO2e annually from sequestration on California' productive, unreserved national forestlands by increasing commercial thinning and fuels reduction accomplishments fivefold annually.

A direct result of active management on Forest Service productive, unreserved lands would be 50-60% reduction in forestland acres burned in wildfires (% based on Forest Service Research); equates to at least a direct reduction of 1 million tons of CO2e (Winrock International). We actually believe data will show that the range of carbon volatilized in forest wildfires in California is 35-75 tons/acre burned (Winrock data). We also know that over the past 10 years, average acres of forestlands burned in California is 212,000 acres (Forest Service, FIA, 2005). Therefore we believe actual CO2e emissions from Calif. forestland wildfires is at least 7 million tons/year and if reduced 50% would show a reduction of 3.5 million tons CO2e annually.

Solid wood products are a direct substitute for non-renewable steel or concrete products and thus provide a direct offset. Science (www.corrim.org) indicates non-renewables

require at least 250 percent more fossil fuel energy than an equivalent wood product. In a 100 year carbon life cycle, this "substitution" of wood for non-renewables amounts to 2 tons CO2e/acre of actively managed forest. If the Forest Service's 9.8 million acres of productive, unreserved lands were actively managed plus the 4 million acres of private industrial accounted for, wood "substitution" for non-renewables could provide a direct offset of 27.6 million tons of CO2e annually.

Using the wood waste generated from a fivefold increase in active fuels reduction on national forests in California would generate 6.5 million bone dry tons that could be used in biomass powerplants to generate electricity and provide 6.5 million tons of direct net reduction of ghg emissions from a fossil fuel-fired powerplant

Totaling all of the above -- Active management of the Forest Service productive forestlands that are not reserved, accounting for substitution of wood products for non-renewables, and accounting for biomass for power generation as a direct offset to fossil-fuel fired powerplants shows an potential opportunity of over 50 million tons CO2e annually that could apply to AB 32 emission reductions goals.

**Emission Reduction Calculations and Assumptions:**
Sequestration from actively managed productive, unreserved National Forest lands -- 9.8 million acres X 0.5 tons carbon/acre/year X 3.67 = 18 million tons CO2 e net sequestration including carbon storage in solid wood products.

9.8 million acres active management on national forests plus 4 million acres active management on private industrial = 13.8 million acres of active forest management in California (note does not account for the potential opportunity on the 4.7 million acres of productive private non-industrial forestlands in California.

Forest Service researchers suggest actively managed national forests would reduce the annual forestland acres burned by wildfire by 50-60%. Winrock estimates 2 million tons of CO2e in annual emissions in California from forestland wildfires. Hence at least a 1 million ton CO2e reduction opportunity. We believe this number is actually much greater. Winrock's own data indicates expected volatilization of carbon in wildfires of 35-75 tons of CO2e/acre burned. Average acres of forestland burned in California over the last 10 years is 212,000 acres so we think the potential CO2e reduction for reduced wildfire could be 3.5 million tons CO2e annually.

Dr. Bruce Lippke (www.corrim.org) has clearly shown that using solid wood as a building material substitute for non-renewable steel or concrete building materials provides a 60-80% reduction in fossil fuel energy requirements. This "substitution" offset provides 2 tons of CO2e/acre/year X 13.8 million acres active management = potential opportunity of 27. 8 million tons CO2e reduction.

Dr. Gregg Morris, Green Power Institute, has clearly demonstrated that for every 1 bone dry ton of wood waste used in a biomass powerplant to generate electricity provides at least a 1 ton net reduction in ghg emissions from a fossil fuel-fired powerplant.

If the Forest Service was performing 600,000 acres/year of commercial thinning and fuels reduction annually rather than there current 100,000 acres/year, there would be at least an additional 7 million bone dry tons of wood waste available for power generation. Hence, a 7 million ton CO2e reduction opportunity.

Adding up the potential opportunities from net sequestration, substitution of solid wood products for non-renewables, and biomass power generation offsets for fossil fuel-fired powerplants equals 50 million tons of CO2e annually that could be applied to AB 32 emission reduction goals.

**Cost-Effectiveness Calculation and Assumptions:**
Actively managed forests are a positive net revenue generator. Therefore, the potential 50 million ton CO2e emission reduction measure offered here is "free" to California.

**Implementation Barriers and Ways to Overcome Them:**
Active management of the Forest Service productive, unreserved forest lands -- Federal Legislation would be required to declare an emergency for federal forestlands at risk to catastrophic wildfire creating a new category of exclusion from NEPA. Currently National Forests in California have 7.5 million acres of productive forestland at risk to catastrophic wildfire.

It would take the Governor to engage the Congress and Executive Branches of Federal Government to provide needed Federal Legislation to free-up the Forest Service to return to active forest management creating healthy forests that are resistant to insects, disease, and wildfire.

There are biomass for power generation barriers that have been addressed and outlined by the California Biomass Collaborative in their Dec. 2006 "A Preliminary Roadmap for the Development of Biomass in California", pp. xii-xx.

The next most important biomass economic issue to overcome is to return to the PURPA SO4 type power-purchase contracts to provide a reasonable price for investors to engage.

Last, the State (CEC and PUC) simply has to recognize the 11 cent/kilowatt "uncompensated" social and environmental benefit of using woody biomass for power generation. If the public goods charge (PGC) were increased from its current 0.9 cents/kilowatt to 2-3 cents/kilowatt, there would a substantial increase in the consumption of existing but currently uneconomic woody biomass in the State. The uncompensated benefits have been well documented by the Western Governors Association (January 2006, Biomass Taskforce Report) and by two publications by Dr. Gregg Morris, Green Power Institute.

**Potential Impact on Criteria and Toxic Pollutants:** There would be diesel engine emissions increases over current levels for forest operations, manufacturing of solid

wood products, and biomass for power generation due to the fivefold increase in annual active forest management on productive National Forests lands.

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