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December 15, 2014

Electronic submittal: http://www.arb.ca.gov/lispub/comm/bclist.php

NOTICE OF PUBLIC HEARING TO CONSIDER AMENDMENTS TO THE CALIFORNIA CAP ON GREENHOUSE GAS EMISSIONS AND MARKET -BASED COMPLIANCE MECHANISMS , December 18, 2014 hearing

AUTHORITY AND REFERENCE
This regulatory action is proposed under the authority granted in Health and Safety Code, sections 38510,38560,38562,38570,38571,38580,39600,39601, and section 16428.8 of the Government Code. This action is proposed to implement, interpret, and make specific sections 38530, 38560.5, 38564, 38565, 38570 and 39600 of the Health and Safety Code.

Dear Richard Corey, Executive Officer, ARB;

Thank you for the opportunity to provide public comment on proposed changes to the U.S. Forest Projects Protocol. The Air Resources Board (ARB) initial statement of reasons refers to updates to the existing U.S. Forest Projects Protocol. There are 72 specific changes listed in the October 28, 2014 Appendix C document for consideration at this time. The 143 page 'Compliance Offset Protocol: U.S. Forest Projects' document appears to be the key decision making document.

As a forestry specialist for the University of California, I am often asked by family forest owners or the professionals they hire to interpret the protocols. Landowners want to determine if a project would be a good fit with their goals. Recent transaction history suggests that out-of-state forest owners where there are few if any constraints on permanently converting forest land have significant advantages over California forest landowners and taxpayers. However, Californians are very inquisitive and often ask me to interpret some of the more complicated mathematical components of the protocols.

I bring three simple mathematical issues forward that would benefit from clarification before the protocols are officially updated.

On page 40, the document refers to 'leakage' and the application of a standard 20% factor that represents wood that would be imported to make up for wood NOT produced from lands involved in an offset project. It appears that this means that if a forest owner enrolls a property designed to increase inventories by reducing harvests that historically had produced wood for ~100 homes, then only ~20 homes would still be built with imported wood. If this is correct, then an offset project

may have an undocumented negative impact on California's supply of housing, as 80% of the homes that used to built would simply not happen.

Using a 20% leakage factor is far below the estimates for generic timber produced in the United States. A number of scholarly articles (e.g. Wear and Murray 2004; Murray, McCarl, et al. 2004) estimated leakage factors of around 90% for west coast conifers. Using the unsubstantiated 20% leakage rate rather than a possibly more relevant leakage rate of 80-90% creates a four-fold change in the baseline calculations for net storage in products. Simple logic suggests that the use of the unsubstantiated 20% leakage figure will always benefit projects that produce fewer renewable products.

On page 19 of document with proposed changes there is a confusing definition of a buffer area, "The width of the buffer area must be a minimum of the area of the harvest unit, rounded up to the nearest acre, multiplied by 40; and…" (p 19) . The typical reader may be confused by the use of an area measurement (e.g. area of a harvest unit in acres or square feet) for a distance measurement (e.g. width of a buffer in feet). Given that the difference between area measurements and distance measurements is covered in the 3rd grade requirements on the Common Core standards, http://www.corestandards.org/Math/Content/3/introduction/, it may be wise to clarify the protocol's use of area measurements for buffer widths.

With respect to the potentially efficacy of promoting only uneven aged management, we now have a number of large examples of forest management that follows the gist of what the staff's proposal of using very limited amounts of even aged management - the US Forest Service. Unfortunately the outcome of the Chips Fire (2012), Rim Fire (2013) and King Fire (2014) on National Forest Lands suggests that a common outcome of such an approach could result in massive emissions of CO2 and a landscape with millions of trees that will decompose and release even more CO2. While no ARB projects were affected by these fires, it is hard to imagine that future fires will not affect projects. While losses of carbon from wildlfires and backburns are considered unplanned, they do lead to a real reduction in carbon stored in our forests.

On page 86, the document refers to using the "Estimated mill efficiency, as determined following the method in appendix C" . While there is no mention of 'mill efficiency in the Appendix C distributed for this meeting, there is a mill efficiency spreadsheet on the ARB website for this meeting at http://www.arb.ca.gov/regact/2014/capandtradeprf14/capandtradeprf14.htm . The ARB website listed on the notice also includes a spreadsheet on mill efficiency coefficients to be used for estimating credits. Unfortunately the web link on the document has been disconnected so there is no way to understand where the data came from. The unreferenced claim of a 0.675 (67.5%) mill efficiency for softwood saw log mills in California seems to be very different from published statistics from the US Forest Service. For example table 41 in Smith (2009) provides empirical data on the mill efficiency for the use of residues after most of the logs are used for lumber or pulp.

Mill Efficiency for residues

Region	Total	Softwood	Hardwood
North	4.9%	5.4%	4.8%
South	0.9%	0.5%	2.1%
Rocky Mtn	1.7%	1.4%	18.9%
Alaska	21.7%	21.7%	
Pacific Northwest	0.3%	0.3%	
Pacific Southwest (CA)	1.8%	1.8%	
US Total	1.5%	0.8%	3.3%

Calculated from table 41 in GTR-WO-78

Source of data: Table 41—Weight of bark and wood residue from primary wood-using mills by type of material, species group, region, subregion, and type (Smith et al. 2009. GTR-WO-78)

If 98.2% of residues are efficiently used in California, it is impossible to figure out how ARB can assert that overall mill efficiency in California is 67.5%. At some point, it would be valuable if the ARB could provide some supporting information for their mill efficiency data. As currently asserted the low mill efficiency estimates guarantee that no U.S. Forest Compliance Offset Protocol project will ever be done on a forest parcel where some of the harvest is used to generate renewable building materials and bioenergy. Given that other state agencies such as Calfire refer to the U.S. Forest Compliance Offset Protocols as a valid accounting approach for other state programs, the protocols have influence beyond ARB.

Conclusion

Hopefully this mathematical inconsistencies will be addressed and clarified. California forest landowners and taxpayers would benefit from clear and well documented project guidance.

Sincerely,

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Murray, B. C., B. A. McCarl, et al. (2004). "Estimating Leakage from Forest Carbon Sequestration Programs." Land Economics **80**: 109-124.

Smith, W. B., tech. coord; Miles, Patrick D., data coord.; Perry Charles H., map coord,; Pugh, Scott A. Data CD coord. (2009). Forest Resources of the United States, 2007. Washington, DC, U.S. Department of Agriculture, Forest Service, Washington Office**:** 336. GTR-WO-78. http://www.treesearch.fs.fed.us/pubs/17334

Wear, D. N. and B. C. Murray (2004). "Federal timber restrictions, interregional spillovers, and the impact on US softwood markets." Journal of Environmental Economics and Management **47**(2): 307-330.