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April 7, 2017

Clerk of the Board
Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Comments on the 2017 Climate Change Scoping Plan Update: Natural and Working Lands GHG Emissions Reduction Goal

Dear ARB Board Members and Staff:

We respectfully submit these comments to the California Air Resources Board (“CARB”) regarding the 2017 Climate Change Scoping Plan Update (“Proposed Plan”). Our comments concern Section IV, Subsection D: Natural and Working Lands Including Agricultural Lands.¹

We are a group of scientific and legal scholars at Stanford University who conduct research on California’s climate change policies. Based on this research, we offer comments relevant to the Natural and Working Lands section of the State’s Proposed Plan. The views expressed in this letter represent our personal views and do not represent the views of our employers, affiliates, or any other organization.

Our research at Stanford University on CARB’s Compliance Offset Program for US Forest Projects (“Forest Offset Program”)² yields five lessons that merit consideration as CARB incorporates Natural and Working Lands into its climate change planning. Prior to this 2017 update, the State had not devised specific goals for carbon stored on Natural and Working Lands, and it had only a partial GHG inventory of Natural and Working Lands emissions. However, California’s experience in implementing the Forest Offset Program has important lessons for the Proposed Plan’s approach to GHG emissions reduction goals on Natural and Working Lands.

Based on our research on the Forest Offset Program and lessons learned, we find in general that the Proposed Plan takes an appropriate approach to goal-setting and carbon

¹ California Air Resources Board, THE 2017 CLIMATE CHANGE SCOPING PLAN UPDATE: THE PROPOSED STRATEGY FOR ACHIEVING CALIFORNIA’S 2030 GREENHOUSE GAS TARGET (January 20, 2017), at 107-17, available at https://www.arb.ca.gov/cc/scopingplan/203osp_pp_final.pdf. Hereafter ‘Proposed Plan’.

² California Air Resources Board, *Compliance Offset Protocol U.S. Forest Offset Projects* (updated December 2, 2015), available at https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/usforestprojects_2015.htm.

accounting on Natural and Working Lands in California. We advise that the relevant state agencies and departments should finalize the goals set forth in the Proposed Plan and implement subsequent efforts with the following five lessons from the Forest Offset Program in mind.

Our recommendations are based on research on the Forest Offset Program, which is a project-based program at a much smaller scope and scale than the Proposed Plan covers for all Natural and Working Lands in California. We note that the Forest Offset Program covers only forest land, and does not cover other lands, including agricultural lands, that are included in the scope of the Proposed Plan.

Although the scope and scale is different, the Forest Offset Program provides three types of germane lessons for the Natural and Working Lands effort: 1) directly transferable lessons based on Forest Offset Program successes; 2) improvements on the Forest Offset Program model in light of program experience; and 3) lessons based on Forest Offset Program successes that require some modifications to be applicable at the scale of the Natural and Working Lands effort.

A summary of our recommendations is provided below. Additional details about our research are provided in the attached paper.

➤ **Lesson #1:** Rigor of approach to carbon accounting drives implementation cost

The Forest Offset Program requires a very rigorous approach to carbon accounting, estimating the exact tonnage of forest carbon present on individual project lands. This is currently achieved at the project level through forest inventory, growth and yield modeling, and third party verification.³ Detailed accounting through these methods cannot be scaled statewide. This level of detailed accounting is appropriate and feasible when dealing with compact and contiguous project lands, but costly and infeasible to conduct on a statewide basis. The State should and does consider methods of carbon accounting on Natural and Working Lands that are significantly less onerous than the Forest Offset Program, but that are still meaningful in terms of measuring changes in emissions and carbon sinks.⁴ This is a case in which the Forest Offset Program uses a method that works well, but cannot be used at the scale of Natural and Working Lands.

The Proposed Plan offers a scale-appropriate method for carbon accounting on lands in California. It indicates that an updated Natural and Working Lands emissions inventory presently underway “applies airborne and space-based technologies to monitor

³ See generally California Air Resources Board, COMPLIANCE OFFSET PROTOCOL U.S. FOREST OFFSET PROJECTS (adopted June 25, 2015), available at <https://www.arb.ca.gov/cc/capandtrade/protocols/usforest/forestprotocol2015.pdf>. Hereafter ‘2015 Forest Offset Protocol’.

⁴ See Proposed Plan at 108.

forest health and quantify emissions associated with land-based carbon.”⁵ Combining remotely-sensed data with ground-based data is a good approach to take at the scale of the state-wide inventory, and should be continued as the inventory is expanded in the coming years.

➤ **Lesson #2:** Transparency and Accessibility of Program Information

The Forest Offset Program produces voluminous data about carbon accounting, project details, and offset usage, and much of it is available to the public through CARB’s website and project registries. However, these data are not easy to locate or interpret. Data sheets can be difficult to find online, and reporting categories change over time, making consistent comparison over time difficult. In this case, the Forest Offset Program is not using best practices, and based on this experience we recommend a more coordinated approach for Natural and Working Lands data transparency and accessibility.

A clear and pre-designed framework for reporting on Natural and Working Lands should be devised as a part of the Integrated Natural and Working Lands Climate Change Action Plan (“Action Plan”).⁶ This will avoid difficulty in reporting and evaluation later on. The Proposed Plan states that the California will “develop implementation tracking and performance monitoring systems for the Action Plan.”⁷ This is especially important and should be a high priority as reporting in the Natural and Working Lands sector requires complex multi-agency efforts.

➤ **Lesson #3:** Approaches to Uncertainty and Risk

Uncertainty: Emissions accounting on Natural and Working Lands, like that for forests, comes with fundamental risks and uncertainties. The designers of the Forest Offset Program developed a number of notable mechanisms to deal with risk and uncertainty in carbon accounting and carbon crediting. For uncertainty, the Forest Offset Program reduces credits earned proportional to the sampling error of an on-the-ground forest inventory.⁸ A similar approach could be applied to data used for carbon accounting on Natural and Working Lands.

At present neither the Proposed Plan nor Appendix G refer to estimation of uncertainty in developing goals or in developing the Action Plan for Natural and Working Lands.⁹ Including uncertainty estimates in ongoing modeling and in the Action Plan will

⁵ Proposed Plan at 108.

⁶ Proposed Plan at 114.

⁷ Proposed Plan at 117.

⁸ 2015 Forest Offset Protocol at 112.

⁹ See Proposed Plan at 117; see also California Air Resources Board, PROPOSED PLAN: APPENDIX G, NATURAL AND WORKING LANDS MODELING (January 2017), available at https://www.arb.ca.gov/cc/scopingplan/app_g_nwl_modeling.pdf

help ensure that the State accomplishes its carbon sink goal for Natural and Working Lands. Including uncertainty estimates is also consistent with IPCC Good Practice Guidance.¹⁰ This is a case in which the Forest Offset Program is using a successful practice that can be adapted for use on Natural and Working Lands.

Risk: For risk, the Forest Offset Program also reduces carbon crediting based on the estimated risk of fire, pests, and other ‘reversal’ risks – the risk of releasing forest carbon to the atmosphere over the life of the project.¹¹ Carbon credits deducted based on a project’s risk rating are allocated to a buffer pool of credits, which can be used in case of carbon loss due to fire, disease, or other unintentional losses.

The Natural and Working Lands sector does not need an explicit buffer account because of its more general carbon sink goals (discussed below), but it does need to plan for unavoidable carbon reversals. The Proposed Plan rightly acknowledges that “recent trends indicate that significant pools of carbon [are at] risk [of] reversal,” and that climate change may exacerbate these risks, especially for wildland fire.¹² Risk should be explicitly incorporated into ongoing Natural and Working Lands modeling to ensure that the State meets its goals for the sector. We recommend adapting the buffer pool approach used in the Forest Offset Program and ‘buffer’ the Action Plan with activities that would exceed the State’s carbon sink goal. This would ensure a ‘contingency fund’ of emissions reductions and enhanced sinks in case of ‘reversal’. Risk estimations could be improved over time as improved data and modeling are available. At present, the Proposed Plan and Appendix G do not discuss accounting for risk in GHG emissions goal-setting for Natural and Working Lands.

➤ **Lesson #4:** Setting a Broad Carbon Sink Goal is Advisable

The experience of the Forest Offset Program shows that modeling future carbon stock, even at the project scale, is a difficult task. Land-based carbon stocks carry risk and uncertainty, as discussed above. The Forest Offset Program dealt with risk by carefully measuring carbon and creating a forest buffer pool—a sort of insurance pool or contingency fund of carbon credits to be used in case of unintentional loss of carbon. The Forest Offset Program further ensures accuracy by requiring multiple levels of verification. While measurement methods for Natural and Working Lands should continue to take advantage of improvements in remote sensing and ground-based data,

¹⁰ See generally Intergovernmental Panel on Climate Change, 2013 REVISED SUPPLEMENTARY METHODS AND GOOD PRACTICE GUIDANCE ARISING FROM THE KYOTO PROTOCOL at 2.57-2.60 (Section 2.4.3 ‘Uncertainty Assessment’), available at http://www.ipcc-nggip.iges.or.jp/public/kpsg/pdf/KP_Supplement_Entire_Report.pdf.

¹¹ 2015 Forest Offset Protocol at 131-36.

¹² Proposed Plan at 108.

the method of detailed ton-by-ton carbon accounting used by the Forest Offset Program is not currently feasible at a statewide scale.

The Proposed Plan states that “California’s climate objective of natural and working lands is to maintain them as a carbon sink (i.e., net zero or even negative GHG emissions).”¹³ The Proposed Plan rightly acknowledges that “the State’s lands, as well as sub-tidal waters, can be both a source and a sink for GHG emissions.”¹⁴ The State’s goal of maintaining Natural and Working Lands as a carbon sink is an appropriate one. An alternative goal would be to specify a particular percentage or numerical decrease in emissions and/or increase in sinks on Natural and Working Lands. Such an exact goal would be inappropriate because it would necessitate many of the onerous measurements and verification activities pursued under project-based programs like the Forest Offset Program, which are impractical for statewide inventories, as mentioned above. Also, measuring carbon in some sectors of Natural and Working Lands (such as soils) remains quite difficult. The overall ‘carbon sink’ goal is less precise but is also therefore feasible to both measure and attain in a statewide inventory.

While we support the overall ‘carbon sink’ goal for Natural and Working Lands, we recommend that the Proposed Plan clarify whether this is a cumulative or annual goal covering the years between now and 2030. There is likely to be considerable year-to-year variability in emissions from Natural and Working Lands, due to fire and other natural causes. The goal is referred to as cumulative on page 109 of the Proposed Plan, but the measure is not specified in the initial statement of the goal.¹⁵ The Initial Scoping Plan (2008) set a specific annual goal for forest carbon sequestration,¹⁶ and this goal has been difficult to measure and attain on an annual basis.

➤ **Lesson #5:** The Offsets Program Does Not Measure Co-Benefits, But Many Are Clearly Delivered

In part because the Forest Offset Program has stringent and detailed carbon accounting requirements, it was not practical, at least in initial years of the program, to require additional accounting of individual project co-benefits. As detailed in the attached report, we advise that the Forest Offset Program now take up ‘no cost’ opportunities for co-benefits reporting. Co-benefits reporting is even more feasible and important for Natural and Working Lands. Because the Natural and Working Lands goals and accounting can take advantage of remotely sensed data, and can tolerate greater

¹³ Proposed Plan at 107.

¹⁴ Proposed Plan at 108.

¹⁵ Proposed Plan at ES5, 107.

¹⁶ California Air Resources Board, CLIMATE CHANGE SCOPING PLAN: A FRAMEWORK FOR CHANGE (December 2008) at 64-65, available at https://www.arb.ca.gov/cc/scopingplan/document/adopted_scoping_plan.pdf.

uncertainty in acre-level carbon data, state agencies should be able to collect data and account for carbon *and* co-benefits.

The Proposed Plan rightly notes that policies must advance both carbon sequestration and co-benefits¹⁷ and states that “strategies that reduce GHG emissions or increase sequestration in the natural and working lands sector often overlap and result in synergies with other sectors.”¹⁸ Accounting for these co-benefits will allow the state to measure the synergies and efficiency gains it is earning by implementing policies that have win-win benefits for carbon, water, agriculture, biomass utilization, land restoration, and conservation. As the State develops tracking and monitoring systems for Natural and Working Lands, these co-benefits should be included. In the Proposed Plan section for ‘Scoping and Tracking Progress’,¹⁹ the text should be amended to read, “develop implementation tracking and performance monitoring systems for the Action Plan, *[including accounting of carbon and other co-benefits]*.”²⁰

For additional details on our research findings on the Forest Offset Program, please see the attached policy paper, along with the forthcoming paper “Forest offsets partner climate change mitigation with conservation” (Anderson, Field & Mach, *in press Frontiers in Ecology and the Environment*). In addition, please do not hesitate to contact us if you have questions about this comment or incorporation of its concerns into the final Scoping Plan.

Sincerely,

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¹⁷ Proposed Plan at 107.

¹⁸ Proposed Plan at 110.

¹⁹ Proposed Plan at 116-17.

²⁰ Proposed insertion in brackets. See Proposed Plan at 117.

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