State of California

Environmental Protection Agency

AIR RESOURCES BOARD

AMENDMENTS TO THE CALIFORNIA CAP ON GREENHOUSE GAS EMISSIONS AND MARKET-BASED COMPLIANCE MECHANISMS

FINAL STATEMENT OF REASONS

August 2015

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State of California
AIR RESOURCES BOARD

Final Statement of Reasons for Rulemaking,
Including Summary of Public Comments and Agency Response

PUBLIC HEARING TO CONSIDER PROPOSED AMENDMENTS TO THE CALIFORNIA CAP ON GREENHOUSE GAS EMISSIONS AND MARKET-BASED COMPLIANCE MECHANISMS

Public Hearing Date: December 18, 2014
Agenda Item No.: 15-5-6

I. GENERAL

A. Action Taken in This Rulemaking

The Staff Report: Initial Statement of Reasons for Rulemaking, entitled "Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms" (Staff Report or ISOR), released October 28, 2014, is incorporated by reference herein. The Staff Report contains a description of the rationale for the proposed amendments. On October 28, 2014, all references relied upon and identified in the Staff Report were made available to the public.

In this rulemaking, the Air Resources Board (ARB or the Board) is adopting amendments to the California Cap-and-Trade Regulation (Regulation) to add a new offset protocol, modify an existing offset protocol, allow reforestation offset projects to be considered early action offset projects even though they may not have been issued early action offset credits, and consider response to wildfires in the context of forest project reversals.

The amendments were developed pursuant to the requirements of the California Global Warming Solutions Act of 2006, also known as Assembly Bill 32 (AB 32). The amendments are codified at Subarticle 12, sections 95802, 95973, 95975, 95976, 95981, 95985, and 95990, title 17, California Code of Regulations (CCR), as well as the updated and new Compliance Offset Protocols.

The amendments to the Regulation, including the proposed new Compliance Offset Protocol for Rice Cultivation Projects (Rice Protocol) and updated Compliance Offset Protocol for United States Forest Projects (Forest Protocol), were initiated with the publication of a notice in the California Notice Register on October 31, 2014, and

notice of public hearing scheduled for December 18, 2014[1]. The Staff Report, the full text of the proposed regulatory amendments, the full text of the Rice Protocol, the full text of the Forest Protocol and other supporting documentation were made available for public review and comment starting on October 31, 2014, for 45 days through to December 15, 2014. The regulatory amendments, as proposed, would:

- Clarify the definition of "Early Action Offset Project" in the Regulation as it relates to reforestation offset projects;
- Provide a new offset protocol to address methane emissions from rice cultivation;
- Update Common Practice values in the Forest Protocol;
- Update the Forest Protocol to add project eligibility for regions of Alaska; and
- Clarify how wildfire response is treated under the intentional reversal provisions of the Regulation as applied to forest offset projects.

At its December 18, 2014, public hearing, the Board approved Resolution 14-44[2], which directed staff to consider additional modifications to the proposed amendments to the Regulation as part of a subsequent 15-day rulemaking package. The Resolution also directed staff to complete the environmental review process by preparing written responses to environmental comments, and to present the responses to the Board at a subsequent hearing for approval, as required by ARB's California Environmental Quality Act (CEQA) certified regulatory program (CCR, title 17, section 60007(a)). On June 15, 2015, staff posted its written responses to environmental comments[3], which staff recommended the Board approve as part of its resolution at the June 25, 2015, Board hearing.

During the 45-day and the subsequent 15-day public comment period, the public submitted comments on the proposed amendments.[4] The 45-day comment period commenced on October 31, 2014, and ended on December 15, 2014, with additional oral and written comments submitted at the December 18, 2014, Board hearing. The 15-day comment period occurred from May 20, 2015, to June 4, 2015.

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[1] California Air Resources Board. Notice of Public Hearing to Consider Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms. Posted October 28, 2014. Available online at: http://www.arb.ca.gov/regact/2014/capandtradeprf14/capandtradeprf14notice.pdf

[2] California Air Resources Board. Board Resolution 14-44. Posted December 22, 2014. Available online at: http://www.arb.ca.gov/regact/2014/capandtradeprf14/res14-44.pdf

[3] California Air Resources Board. Response to Comments on the Environmental Analysis prepared for the Proposed Amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms (Cap-and-Trade Regulations). Available online at: http://www.arb.ca.gov/regact/2014/capandtradeprf14/rtcafterhearing.pdf

[4] All public comments received on the proposed amendments can be found online at: http://www.arb.ca.gov/lispub/comm/bccommlog.php?listname=capandtradeprf14

At a public hearing held on June 25, 2015, the Board approved Resolution 15-19[5], approving the written responses to environmental comments, making required CEQA and other findings, and adopting the final regulatory amendments, including the Rice Cultivation Projects and U.S. Forest Projects Compliance Offset Protocols. The Resolution also directed the Executive Officer to finalize the Final Statement of Reasons (FSOR) for the regulatory amendments and to submit the final rulemaking package to the Office of Administrative Law for review. The FSOR provides written responses to all comments received on the proposed amendments during the 45-day and 15-day comment periods, during the December 18, 2014, Board hearing, and during the final June 25, 2015, Board hearing.

B. Mandates and Fiscal Impacts to State Government, Local Agencies, Businesses, and Private Individuals

The Board has determined that the proposed regulatory action would not create costs or savings, as defined in Government Code sections 11346.5(a)(5) and 11346.5(a)(6), to State agencies or in federal funding to the State. The proposed regulatory action would not create costs and would not impose a mandate on State and local agencies, or school districts. Eight California public universities, the California Department of Water Resources, several municipal utilities, and one county correctional facility have a compliance obligation under the current regulation that is unchanged by the proposed regulatory action. The regulation already requires these entities to surrender allowances or offsets equal to the amount of their GHG emissions during the compliance period. Because the regulatory requirements apply equally to all covered entities and unique requirements are not imposed on local agencies, the Executive Officer has determined that the proposed regulatory action imposes no costs on local agencies that are required to be reimbursed by the State pursuant to part 7 (commencing with section 17500), division 4, title 2 of the Government Code, and does not impose a mandate on local agencies or school districts that is required to be reimbursed pursuant to section 6 of Article XIII B of the California Constitution.

In developing this regulatory proposal, ARB staff evaluated the potential economic impacts on representative private persons or businesses. The proposed Regulation adds a new Compliance Offset Protocol and expands the region of eligibility of another Compliance Offset Protocol. Participation in the offsets program is voluntary and provides an economic incentive to reduce greenhouse gas (GHG) emissions from non-covered sources and provides additional cost containment for covered entities. The proposed amendments do not add any additional costs over what was

[5] California Air Resources Board. Board Resolution 15-19. Posted July 29, 2015. Available online at: http://www.arb.ca.gov/regact/2014/capandtradeprf14/res15-19.pdf

assumed in the original Cap-and-Trade Regulation. There are no requirements placed on non-covered businesses or private individuals.

The Executive Officer has determined that representative private persons and businesses would not be affected by the proposed regulatory action. Pursuant to Government Code section 11346.5(a)(7)(C), the Executive Officer has made an initial determination that the proposed regulatory action would not have a significant statewide adverse economic impact directly affecting businesses, and little or no impact on the ability of California businesses to compete with businesses in other states. The proposed regulation would not impose sufficient direct or indirect costs to eliminate businesses in California. A detailed description of the economic impacts associated with the proposed amendments is included in Chapter V of the Staff Report.

C. Consideration of Alternatives to the Proposed Amendments

ARB staff is required to consider alternatives to the proposed amendments of the Cap-and-Trade Regulation. As discussed in Chapter VI of the Staff Report, staff analyzed the following alternative to the proposed amendments to the Cap-and-Trade Regulation:

- Do not amend the Cap-and-Trade Regulation (No Project Alternative);

For the reasons set forth in the Staff Report, in ARB staff's comments and responses to comments at the Board hearings, and in this FSOR, the Board determined that no alternative considered by the agency would be more effective in carrying out the goals of AB 32, or would be as effective as and less burdensome to affected private persons, or would be more cost-effective to affected private persons and equally effective in implementing the statutory policy or other provisions of law than the action taken by the Board. Further, none of the options that would have enabled California to meet AB 32 goals were as cost effective as the proposed Regulation and substantially address the public problem stated in the notice. ARB staff provides a discussion of the alternative in Chapter VI of the Staff Report for the proposed amendments.

II. MODIFICATIONS MADE TO THE ORIGINAL PROPOSAL

A. Modifications Approved at the Board Hearing and Provided for in the 15-Day Comment Period

Pursuant to the Board direction provided in Resolution 14-44, ARB released a Notice of Public Availability of Modified Text and Availability of Additional Documents (15-

Day Notice) [6] on May 20, 2015, which placed additional documents into the regulatory record and presented the additional modifications to the regulatory text after extensive consultation with stakeholders, including modifications to the Rice and Forest Protocols.

B. Non-Substantive Corrections to the Regulation

After the close of the 15-day comment period, the Executive Office determined that no additional modifications should be made to the Regulation or protocols, with the exception of the non-substantive changes listed below:

1. Grammatical change: In section 95802(a)(190), a comma was added after "rather" for ease of reading.
2. Remove date placeholder: ARB staff replaced the placeholders throughout the Regulation and protocols with the date of the adoption of the Rice and Forest Protocols, which is June 25, 2015.
3. Correction of a typographical error: In subchapter 1.2(a)(4) of the Rice Protocol the "M" in "Management" was capitalized because it is a part of a proper noun – "Butte Sink Wildlife Management Area"
4. Correction of citation: Subchapter 1.2(a)(37) of the Rice Protocol incorrectly cites subchapter 4.6, which does not exist, when referring to the start date of a project. The correct reference for start date is actually in subchapter 3.6 which addressed project commencement. Subchapter 1.2(a)(37) has been modified to refer to the correct citation.
5. Grammatical change: In subchapter 2.2(b)(1)(c) of the Rice Protocol, a comma was added after "possible" for ease of reading.
6. Grammatical change: In subchapter 5.2.4(c)(1) of the Rice Protocol a comma was added after "i.e." for ease of reading.
7. Grammatical change: In subchapter 5.2.4(d)(1) of the Rice Protocol a comma was added after "i.e." for ease of reading.
8. Remove unnecessary text: Subchapter 5.2.4(e) of the Rice Protocol was removed because it is no longer necessary after the updates to the structural uncertainty calculation in the 15-day comment period. The preliminary OPDR was removed in 15-day modifications to subchapter 7.2 and is no longer a required document to submit.
9. Grammatical change: In table 6.1, footnote 4 of the Rice Protocol a comma was added after "i.e." for ease of reading.

[6] California Air Resources Board. Notice of Public Availability of Modified Text and Availability of Additional Documents. Posted May 20, 2015. Available online at: http://www.arb.ca.gov/regact/2014/capandtradeprf14/Capandtrade15daynotice.pdf

10. Remove incorrect text: In subchapter 7.2(a)(13) of the Rice Protocol the "*" was removed because it is no longer necessary. The "*" denoted a later reporting of the primary emission reductions which is no longer necessary due to the amended structural uncertainty calculation. The text describing the "*" had previously been removed.
11. Remove unnecessary text: Subchapter 8.1(e) of the Rice Protocol was removed because it is no longer necessary after the updates to the structural uncertainty calculation in the 15-day comment period. Goes with the removal of subchapter 5.2.4(e) above. The remaining letters in subchapters 8.1 are adjusted for the removal.
12. Grammatical change: In Appendix A(a)(4) of the Rice Protocol, a comma was added after "e.g." for ease of reading.
13. Grammatical change: In subchapter 3.4.1(c)(3) of the Forest Protocol the word "must" was removed because it does not belong. Taken with the language in subchapter 3.4.1(c) the requirement read as: "The legal requirement test is satisfied if: Avoided conversion projects must submit official documentation…" And it should read "…if: Avoided conversion projects submit…"
14. Remove incorrect text: In equation 5.8 of the Forest Protocol the stratified carbon weighting factor (SWF) is incorrectly identified as having unit of MT CO_2e. As can be seen from the equation for calculating the SWF (equation 5.9), SWF is a unit-less value.
15. Remove incorrect text: In equation 5.9 of the Forest Protocol the stratified carbon weighting factor (SWF) is incorrectly identified as having unit of MT CO_2e. As can be seen from the equation for calculating the SWF (equation 5.9), SWF is a unit-less value.
16. Remove incorrect text: In table 5.2 of the Forest Protocol the Carbon Rating is incorrectly identified as having the units of metric tons CO_2e/acre. The value should be unit-less as a relative measure of forest carbon.
17. Correction of a typographical error: In equation 5.10 of the Forest Protocol the index of summation was incorrectly identified as "n-1" rather than "n=1". Subtracting one from the index is mathematically meaningless. The sum should be for all reporting periods up to the current reporting period.
18. Change for consistency: In equation C.8 of the Forest Protocol the carbon to carbon dioxide conversion factor of 3.664 was replaced with 3.667 for consistency with the same factor in other places in the protocol. While both are technically correct, the same factor should be used in all calculations.
19. Change for consistency: In equation C.17 of the Forest Protocol the carbon to carbon dioxide conversion factor of 3.664 was replaced with 3.667 for consistency with the same factor in other places in the protocol. While both are technically correct, the same factor should be used in all calculations.

20. Remove incorrect text: In Appendix F(d)(1) of the Forest Protocol the text "basal area" was removed because basal area is in units of square feet and is not the correct metric. The correct metric for the site class growth is volume in cubic feet/acre/year.
21. Remove incorrect text: In Appendix F(d)(2) of the Forest Protocol the text "basal area" was removed because basal area is in units of square feet and is not the correct metric. The correct metric for the site class growth is volume in cubic feet/acre/year.

III. DOCUMENTS INCORPORATED BY REFERENCE

The Cap-and-Trade Regulation, the U.S. Forests Projects Compliance Offset Protocol, and the Rice Cultivation Projects Compliance Offset Protocol adopted by the Executive Officer incorporate by reference the following documents:

1. Compliance Offset Protocol U.S. Forest Projects (June 25, 2015)
2. Compliance Offset Protocol Rice Cultivation Projects (June 25, 2015)
3. Mill Efficiency Data (updated with values for Alaska), May 1, 2015.
4. Assessment Area Data File (updated with values for Alaska), May 1, 2015.
5. Supersection maps and GIS shapefile, May 1, 2015.
6. UDSA Forest Inventory and Analysis Database Description and User Guide for Phase 2 (V6.0.1), Appendix D, April 2014.
7. USDA Soil Quality Test Kit Guide (July 2001)

These documents were incorporated by reference because it would be cumbersome, unduly expensive, and otherwise impractical to publish them in the California Code of Regulations. In addition, some of the documents are copyrighted, and cannot be reprinted or distributed without violating the licensing agreements. The documents are lengthy and highly technical test methods and engineering documents that would add unnecessary additional volume to the regulation. Distribution to all recipients of the California Code of Regulations is not needed because the interested audience for these documents is limited to the technical staff at some of the reporting facilities, most of whom are already familiar with these methods and documents. Also, the incorporated documents were made available by ARB upon request during the rulemaking action and will continue to be available in the future by contacting the agency contacts identified in the Notice of Public Hearing.

IV. SUMMARY OF COMMENTS MADE DURING THE 45-DAY COMMENT PERIOD AND AGENCY RESPONSES

Chapter IV of this FSOR contains all comments submitted during the 45-day comment period and the December 18, 2014 Board hearing that addressed the proposed amendments or the procedures followed by ARB in proposing the amendments, together with ARB's responses. The 45-day comment period commenced on October 31, 2014, and ended on December 15, 2014, with additional comments submitted at the December 18, 2014, Board hearing on the proposed amendments.

ARB received 52 letters on the proposed amendments during the 45-day comment period, including the December 2014 Board hearing. In addition, 18 commenters gave oral testimony during the December 2014 Board hearing. Commenters included representatives from the electricity and natural gas sectors, offset project developers and offset registries, and representatives from trade groups. To facilitate use of this document, comments are categorized into one of four sections below (B through E), and are grouped for response wherever possible.

Section A below lists commenters that submitted oral and written comments on the proposed amendments during the 45-day comment period and at the December 2014 Board Hearing, identifies the date and form of their comments, and shows the abbreviation assigned to each.

A. LIST OF COMMENTERS

Abbreviation	Commenter
ACR-1	Jessica Orrego, Director of Forestry, American Carbon Registry and Stewart McMorrow, CA Registered Professional Forester, Senior Forestry Associate, American Carbon Registry Written Testimony: 12/15/2014
ACR-2	John Kadyszewski, American Carbon Registry Written Testimony: 12/15/2015
AFRC-1	Tom Partin, President, American Forest Resource Council Written Testimony: 12/10/2014
AFT-1	James Daukus, American Farmland Trust Written Testimony: 12/12/2014
BCAQMD-1	W. James Wagoner, Air Pollution Control Officer, Butte County Air Quality Management District Written Testimony: 12/15/2014
BFFP-1	George Gentry, Executive Officer, Board of Forestry and Fire Protection Written Testimony: 12/15/2014
BLUESOURCE-1	Roger Williams, President, Blue Source Written Testimony: 12/11/2014

BLUESOURCE-2	Roger Williams, President, Blue Source Oral Testimony: 12/18/2014
CAC-1	Sheri Buretta, Chairman of the Board, Chugach Alaska Corporation Oral Testimony: 12/18/2014
CACORP-1	Sheri Buretta, Chairman of the Board, Chugach Alaska Corporation Written Testimony: 12/15/2014
CAGG-1	Coalition on Agricultural Greenhouse Gases (C-AGG, California Farm Bureau Federation (CFBF), International Emissions Trading Association (IETA) Written Testimony: 12/15/2014
CAR-1	Derik Broekhoff, Climate Action Reserve Written Testimony: 12/12/2014
CCS-1	Alastair Handley, President, Carbon Credit Solutions Written Testimony: 12/15/2014
CE2-1	Greg Arnold, Managing Partner, CE2 Capital Partners, LLC, et al. Written testimony: 12/15/2014
CE2-2	Tony Brunello, Representing CE2 Carbon Capitol Oral Testimony: 12/18/2014
CFA-1	Steven A. Brink, Vice President, Public Resources, California Forestry Association Written Testimony: 12/15/2014
CFA-2	Steve Brink, Vice President of Public Resources, California Forestry Association Oral Testimony: 12/18/2014
CGLO-1	Stephen Levesque, Director Forest Operations, Campbell Global Written Testimony: 12/15/2014
CRC-1	Paul Buttner, Manager of Environmental Affairs, California Rice Commission Written Testimony: 12/15/2014
CRC-2	Paul Buttner, Manager of Environmental Affairs, California Rice Commission Oral Testimony: 12/18/2014
CW-1	Alex Rau, Climate Wedge Written Testimony: 6/30/2014
CW-2	Alex Rau, Partner, Climate Wedge LLC Oral Testimony: 12/18/2014
ECOP-1	Kyle Holland, Managing Director, ecoPartners Written Testimony: 12/15/2014
EDF-1	Robert Parkhurst, Director, Agriculture Greenhouse Gas Markets, Environmental Defense Fund Written Testimony: 12/15/2014
EDF-2	Robert Parkhurst, Director of Agriculture Greenhouse Markets, Environmental Defense Fund

	Oral Testimony: 12/18/2014
ESI-1	Richard Scharf, Environmental Services Inc. Written Testimony: 12/12/2014
EWFA-1	Tom Gaman, East-West Forestry Associates Written Testimony: 12/15/2014
FCC-1	Sean Carney, President, Finite Carbon Corporation Written Testimony: 12/15/2014
FCC-2	Sean Carney, President, Finite Carbon Corporation Oral Testimony: 12/18/2014
ESI-2	Janice McMahon, Vice President and Regional Technical Manager, Forestry, Carbon, and GHG Services, Environmental Services Inc. Written Testimony: 12/15/2014
FWW-1	Wenonah Hauter, Executive Director, Food & Water Watch Written Testimony: 12/15/2014
GA-1	Christopher D. Newton, Chief Executive Officer, Green Assets Inc. Written Testimony: 12/5/2014
GDRC-1	Gary C. Rynearson, Manager, Forest Policy and Communications, Green Diamond Resource Company Written Testimony: 12/15/2014
GDRC-2	Gary Rynearson, Green Diamond Resource Company Oral Testimony: 12/18/2014
IETA-1	Dirk Forrister, International Emissions Trading Association (IETA) President and CEO Written Testimony: 12/15/2014
IETA-2	Josh Strauss, International Emissions Trading Association (IETA) Oral Testimony: 12/18/2014
LCCARBON-1	David Ford, President and CEO, L&C Carbon LLC Written Testimony: 12/15/2014
NAFO-1	David P. Tenny, President and CEO, National Alliance of Forest Owners Written Testimony: 12/15/2014
NFI-1	Brian Shillinglaw, Tim Robards, Emily Warms, New Forests Inc. Written Testimony: 12/15/2014
NFI-2	Brian Shillinglaw, Associate Director, New Forests Inc. Oral Testimony: 12/18/2014
NOAFIL-1	Matthew Keene, No Affiliation Written Testimony: 11/21/2014
OCSEES-1	James Tansey, Chief Executive Officer, Offsetters Climate Solutions and Era Ecosystem Services Written Testimony: 12/15/2014
ORM-1	Adrian Miller, Manager of Policy and Environment, Olympic Resources Management Written Testimony: 12/2/2014
OXM-1	Michael W. Ludlow, President, Oxbow Mining LLC

	Written Testimony: 12/15/2014
PCTC-1	Mike Jostrom, Director, Renewable Resources, Plum Creek Timber Co. Written Testimony: 12/15/2014
PFT-1	Paul Mason, Pacific Forest Trust Written Testimony: 12/15/2014
PGE-1	Mark C. Krause, Senior Director, State Agency Relations, Pacific Gas and Electric Written testimony: 12/15/2014
PGE-2	Mark Krause, Senior Director, State Agency Relations, Pacific Gas and Electric Oral Testimony: 12/18/2014
RCE-1	Michael Coté, President, Ruby Canyon Engineering, Inc. Written testimony: 12/15/2014
SCE-1	Adam Smith, Program Manager of Climate Policy, Southern California Edison Oral Testimony: 12/18/2014
SCS-1	Zane Haxtema, SCS Global Services Written Testimony: 12/15/2014
SCS-2	Christine Pollet-Young, Director of Greenhouse Gas Verifications Services, SCS Global Services Oral Testimony: 12/18/2014
SFA-1	Ami Gunasekara, Advisor to the Secretary of Food and Agriculture Oral Testimony: 12/18/2014
SIGLLC-1	Charles Kerchner Ph.D, Senior Scientist and Program Manager, Spatial Informatics Group LLC Written Testimony: 12/15/2014
SPI-1	Edward C. Murphy, Manager Resource Inventory Systems, Sierra Pacific Industries Written Testimony: 12/15/2014
SPI-2	Edward Murphy, Sierra Pacific Industries Oral Testimony: 12/18/2014
STAN-1	Aaron Strong, Ph.D. Candidate, Environment & Resources (E-IPER) and Barbara Haya, Research Fellow, Stanford University Written Testimony: 12/15/2014
SVLG-1	Mike Mielke, Vice President, Environmental Programs and Policy, Silicon Valley Leadership Group Written Testimony: 11/26/2014
TFG-1	Kaarsten Turner Darby, Vice President, The Forestland Group LLC Written Testimony: 12/15/2014
TFPL-1	James A. Daley III, Director, Climate Conservation Program, The Trust for Public Land Written Testimony: 12/15/2014
TGC-1	Leslie Durschinger, Terra Global Capital, LLC Written Testimony: 12/15/14

TNC-1	Alexander Leumer, Climate Change Policy Associate The Nature Conservancy Written Testimony: 12/15/2014
TNC-2	Alex Leumer, Climate Change Policy Associate, the Nature Conservancy Oral Testimony: 12/18/2014
UCB-1	William Stewart, Forestry Specialist, University of California, Berkeley Written Testimony: 12/15/2014
VCG-1	Thomas Vessels, Vessels Coal Gas Inc. Written Testimony: 12/11/2014
VCG-2	Thomas Vessels, Chief Executive Officer, Vessels Coal Gas, Inc. Oral Testimony: 12/18/2014
WEYCOMP-1	Edie Sonne Hall, Weyerhaeuser Company Written Testimony: 12/15/2014
WFPA-1	Mark Doumit, Executive Director, Washington Forest Protection Association Written Testimony: 12/15/2014

B. COMPLIANCE OFFSET PROTOCOL RICE CULTIVATION PROJECTS

B-1. General Support for Protocol

B-1.1. Multiple Comments: Offsets play a key role in helping keep costs down in a cap and trade system. They give companies an option to reduce emissions from an uncapped entity as an alternative to lowering their own emissions or purchasing emissions permits. This option in turn works to help keep the cost of permits traded in the system competitive with the offset price, helping achieve reductions at the lowest cost.

Credible, verifiable, enforceable offsets are an important facet of a well-designed cap and trade scheme. The ARB is considering agricultural offsets in the rice sector in its December meeting; we support inclusion of such offsets as a way to engage the agricultural sector to participate in the state's greenhouse gas reduction goals in a way that works well for California businesses. *(SVLG-1)*

Comment: American Farmland Trust (AFT) is a national nonprofit organization, founded in 1980. Its mission is to protect the best farmland from conversion to other uses, keep farmers on the land, and promoting sound farming practices that protect and enhance natural resources. To that end, AFT supports ecosystem services markets as an efficient mechanism to enhance the environment and farming economics. AFT applauds the State of California and the Air Resources Board (ARB) in developing an important ecosystem services market in greenhouse gas mitigation and supporting the development of the first compliance offset protocol

from agricultural cropping systems in the form of the Rice Cultivation Projects Compliance Offset Protocol and the associated staff report of October 28. This protocol is precedent setting and will have national and perhaps global implication. AFT supports the protocol and guidance set forth in the staff report, and offers the following comments that hopefully will foster broader farmer participation while maintaining the scientific rigor and conservatism necessary for a compliance protocol.

AFT greatly appreciates the work of EDF, the California Rice Commission, the Climate Action Registry, the Climate Trust, ARB staff and other partners put into developing the Rice Protocol and we look forward to having the Board pass the October 28 version, with suggested amendments of the Rice Protocol at its December meeting. This protocol demonstrates the role and opportunity that cropland can play within California's Cap-and-Trade program to generate valuable offsets and contribute toward the state's 2020 GHG emission reduction goals.

AFT supports ARB efforts to implement the Verification Pilot. Streamlined reporting and verification requirements that maintain rigorous accounting while preserving privacy, will allow the greatest participation resulting in maximum generation of GHG reductions. AFT offers its assistance to ARB and CDFA in piloting specific reporting and verification requirements, which will make it easier and less expensive for farmers to participate in the Rice Protocol.

Thank you again for the opportunity to comment on this important effort. We look forward to working with ARB and other stakeholders throughout the implementation of this and other agricultural-based offset protocols. *(AFT-1)*

Comment: TNC supports the inclusion of agriculture-based offsets in California's greenhouse gas (GHG) cap and trade program that support existing land uses and are environmentally and economically sound. We believe that projects consistent with the proposed rice cultivation-based offset protocol will provide cost-effective and meaningful GHG emission reductions and meet these other priorities. By enabling rice growers to generate offsets with modest changes in management practices and minimal impacts on expected yields, the rice cultivation protocol will result in actions that are compatible with human land uses, and economic and environmental priorities and ultimately be successful.

TNC shares ARB's goal of designing offset practices which avoid negative environmental impacts and generate meaningful co-benefits in addition to greenhouse gas reduction benefits. For the rice protocol, these co-benefits include maintenance of important wildlife habitat, especially for migratory and resident bird species, and continuing support for sustainable, local economies.

We commend ARB's significant investment of staff time and stakeholder engagement to ensure that this protocol does not materially affect migratory birds and other wildlife. In developing this protocol, the ARB held four Technical Working Group meetings and two Workshops, in addition to independent consultations and presentations with technical experts, the process involved diverse stakeholders, including rice growers in California and the Mid-South, agricultural trade groups, conservation groups (including Ducks Unlimited, Point Blue, Audubon, Environmental Defense Fund), project developers, project registries (including the American Carbon Registry and Climate Action Reserve), and verification bodies. During this process, ARB sought input from these diverse stakeholders and used this information to make several substantial changes to the protocol's text which eliminate or mitigate negative impacts on wildlife. TNC believes this process can serve as a model for how ARB assesses non-GHG environmental impacts of future revisions of this protocol as well as new protocols.

The current version of the rice cultivation protocol includes numerous requirements which reflect safeguards against negative impacts on migratory birds. The rice-growing regions included in the protocol provide critical habitat for migratory birds along North America's two largest flyways. It is essential this habitat is not affected by the practices proposed in the protocol.

We concur with ARB's conclusions regarding the protocol's impacts on migratory water birds, which draw in part from a two-year study conducted by Point Blue Conservation Science. TNC supports the study's design, overall conclusions, and its use by ARB in drafting of this protocol.

TNC commends the excellent work of ARB staff as they developed this offset protocols and cap and the larger cap and trade system and appreciates this opportunity to offer our recommendation and support. We look forward to working with ARB and other stakeholders in the development of additional project protocol for agricultural practices that are also compatible with human land uses, and economic and environmental priorities. *(TNC-1)*

Comment: EDF applauds the extensive work the California Air Resources Board (ARB) has put into the Rice Protocol since the first workshop in March 2013. We particularly appreciate the updates and revisions ARB made to the June 20 version. ARB has a long standing reputation for developing informed and scientifically sound policies and regulations; this protocol is no exception. We believe that the Rice Protocol is an important step in the generation of offsets from agriculture. This protocol is the logic starting point as rice growers are one of the most progressive industries when it comes to both feeding the world and protecting the environment.

The industry has demonstrated this through the listing of the first rice cultivation offset project with the American Carbon Registry (ACR) last March. They are also in

the process of developing a project with growers in the Mid-south which will also be listed with ACR. We are hopeful these projects will encourage other growers to participate, providing capped entities with high-quality offsets from U.S. rice growers.

EDF supports the October 28 version of the Rice Cultivation Projects Compliance Offset Protocol and we are looking forward to the Board's approval of this protocol at the December Board Meeting.

The Staff Report demonstrates the rigor employed by ARB staff to finalize the Rice Protocol. Significant thought and effort have gone into the current version, which demonstrates ARB's view on the important role of agriculture in meeting California's greenhouse gas (GHG) reduction targets. This rigor includes the identification and simplification of a process-based biogeochemical model as well as extensive stakeholder outreach.

The Rice Protocol is the first protocol to use a process-based model, the DeNitrification DeComposition (DNDC) model, which is an important tool to quantify GHG emission reductions from agriculture-based offset projects. The DNDC model generates detailed and accurate emission reductions for biological systems. As a part of this rulemaking, ARB conducted extensive due diligence in reviewing and selecting the DNDC model for use in the Rice Protocol.

DNDC is a very detailed model and as such requires significant inputs and generates comprehensive outputs. We support the ARB's ongoing effort to develop a simplified front and back end to the tool to make it more accessible to growers and offset project developers. This tool will ease the burden of entering input data into DNDC and consolidating DNDC output data, and thus will lower the barriers to the adoption of the protocol. We encourage the ARB to continue to fast-track the development of the tool in preparation for the training of ARB-Accredited Verification Bodies, ARB Approved Offset Project Registries, Offset Project Operators (OPO) and Authorized Project Designees (APD) to take place in the spring of 2015.

In developing this protocol, the ARB held four Technical Working Group meetings and two Workshops, in addition to independent consultations and presentations with technical experts. The Technical Working Group included more than 70 participants. In addition, ARB staff involved diverse stakeholders throughout the process, including rice growers in California and the Mid-south, the California Department of Food and Agriculture (CDFA), agricultural trade groups (California Rice Commission, California Farm Bureau), conservation groups (Ducks Unlimited, Point Blue Conservation Science, Audubon Society), project developers, project registries (American Carbon Registry, Climate Action Reserve), verification bodies, and compliance entities. The California State Board of Food and Agriculture mentioned in their November 5, 2014 letter to Chairman Nichols (attached at the end of this letter) that they "are encouraged by the involvement and collaboration of many

stakeholders in the development of the protocol and understand the critical need of having the appropriate science and metrics in place."

…We appreciate the hard work that went into the development of the Rice Protocol and we look forward to having the Board consider the Rice Protocol at the ARB's December Board meeting. This protocol demonstrates the role and opportunity agriculture can play within California's Cap-and-Trade program to generate valuable offsets and contribute toward the state's 2020 goal. We agree with the California State Board of Food and Agriculture that "This protocol is essential because it not only recognizes the important role that the California agricultural sector can have in offsetting greenhouse gas emissions but it can also serve as an impetus for further emission reduction practices by farmers and ranchers."

We thank ARB for this opportunity to offer comments. We look forward to continued collaboration with ARB and other stakeholders throughout the implementation of this and other agriculture-based offset protocols. *(EDF-1)*

Comment: Offsets are an important part of a well-functioning cap-and-trade program, and serve as a cost-containment mechanism for regulated sectors while achieving beneficial GHG emissions reductions from unregulated sectors. Science-based offset protocols that are designed with the agricultural sector in mind must take into consideration the biological nature of these managed ecosystems and the economic and socio-cultural nature of the agricultural sector. Well-designed, effective offset protocols for the agricultural sector must be flexible enough to allow for variability due to changing weather, climate, land tenure and ownership, for instance, while also encouraging innovation, which is a hallmark of the US agricultural sector.

C-AGG applauds the California Air Resources Board's (ARB) commitment to develop agricultural protocols that will engage the agricultural sector in voluntary opportunities to contribute to California's cap-and-trade program and emissions reduction obligations. ARB has shown dedication to the time-consuming and complex process of developing this protocol, and has been open to stakeholder dialogue and interactions that have helped to enhance iterations of the protocol over time, and show an appreciation for the complexities of agriculture and land-based offsets. As our previous comments indicated, we believe that the Rice Cultivation Offset Protocol will provide important precedents for other agricultural offset protocols developed and approved by ARB in the near future. *(CAGG-1)*

Comment: We compliment the ARB staff for helping us to protect the tremendous wildlife habitat provided by rice; especially winter-flooded rice. Winter flooding began as a primary alternative to burning the rice fields in response to the rice burn

Legislation. Two great results followed--cleaner skies in the Sacramento Valley and millions of waterbirds moving in to use this winter habitat. This proposed Rice Protocol enables the California rice industry to help California meet its GHG reduction goals though a sensible, market-based program that preserves our industry's positive environmental contributions. Even though our winter flooding results in modest methane emissions, the ARB's proposal purposely avoids impacting this practice in order to preserve important habitat. We appreciate the ARB recognizing these valuable benefits and inviting us to promote a pair of targeted voluntary practices that carefully avoids impacting our industry's significant contributions to millions of waterbirds and other wetland-dependent species of wildlife now reliant upon California rice fields.

The CRC is supportive of the ARB adopting the proposed Rice Protocol. In turn, the

CRC is committed to promoting this voluntary opportunity to our members as part of our efforts to contribute positively to GHG reduction efforts in California. *(CRC-1)*

Comment: Thank you very much for the effort undertaken to create the "Compliance Offset Protocol Rice Cultivation Projects" made available on October 28, 2014. We appreciate the significant amount of work that went into drafting this protocol and we understand the importance of making sure that the protocol delivers real, permanent, quantifiable, verifiable, enforceable, and additional offsets to ensure that California's cap-and-trade program remains in place and is not subject to criticism and further law suits.

We are very much in support of market-based mechanisms for conservation and see the importance of offsets being in line with the state's interests of providing a cost effective cap and trade compliance system and encouraging improved agriculture, soil conservation, and lowering GHG emissions. As a significant amount of global GHG emissions originate from the agriculture sector, it is imperative that agriculture offsets should be the foremost interest to ARB. California is the largest agricultural state in the U.S. and it is important that its compliance markets do all they can to support farmers and rural livelihoods to produce food in the most sustainable manner.

We are also working directly with the first group of rice growers who are adopting low emission practices in California and the Mid-south to prepare their project to produce verified emission reductions under voluntary and compliance markets. This work has provided us with a deep understanding of the issues that lead to farmer adoption and the economics of producing emission reductions under protocols. We are one of the first organizations to partner with extension agents, industry groups to actually help growers collect practice and baseline data, estimate the costs of applying protocols and performing the GHG emission calculations using DNDC model in accordance with the American Carbon Registry protocol.

As our previous public comments on the protocol have indicated, Terra is committed to supporting rice grower's participation in the compliance market and assist ARB develop the Rice Cultivation Protocol with integrity and efficacy. *(TGC-1)*

Comment: The American Carbon Registry (ACR), an Air Resources Board (ARB)-approved Offset Project Registry (OPR) for the California cap-and-trade program, has carefully reviewed the *Compliance Offset Protocol Rice Cultivation Projects* (COP), released on October 28, 2014. Herein, ACR provides public comments on the proposed protocol as part of the 45 day comments period.

As an OPR, ACR shares ARB's commitment to offset protocols that reflect the best possible science, ensuring the environmental integrity of California's landmark Cap-and-Trade Program. ACR is also dedicated to the demonstration of robust market-based programs as the most efficient means to reduce emissions cost effectively. With our parent organization's headquarters and roots in the Mid-South and ACR's base in Sacramento – the two leading rice-growing regions in the U.S. - ACR has a strong interest in ensuring the workability of the ARB compliance offset protocol for rice cultivation. Based on our extensive experience in agriculture, forestry and land use greenhouse gas (GHG) accounting methodologies, we understand the technical complexities of these project types and we applaud ARB's perseverance in developing a first-of-its-kind agriculture and biogeochemical-based Compliance Offset Protocol.

ACR continues to support ARB's inclusion of science-based, rigorous process models to estimate GHG emissions from agricultural systems. Investment in a simplified front and back end of the DNDC model will significantly reduce transaction costs and complexity for rice projects. We commend ARB's persistent work in drafting the first compliance offset methodology to feature accounting based on biogeochemical modeling, and encourage the simplified front and back end design to be released as soon as possible, in order for it to be utilized widely for feasibility purposes. ACR is pleased to see the adoption of this scientifically rigorous, process-based model in a regulatory framework and happily recognizes that this can help facilitate the development of additional land-based compliance offset protocols such as nutrient management and wetland restoration. *(ACR-2)*

Comment: The Nature Conservancy supports the rice cultivation project compliance offset protocol and recommends its approval. TNC shares ARB's goals of designing offset practices which avoid negative environmental impacts, and we commend ARB's significant investment of staff time and stakeholder engagement to ensure that this protocol does not materially affect migratory birds and other wildlife.

The current version of the protocol includes numerous requirements which reflect safeguards against negative impacts and migratory birds. The rice growing regions included in the protocol provide critical habitat for migratory birds along North

America's two largest fly ways. It's essential that habitat is not effected by the practices proposed in the protocol.

We commend the excellent work of ARB staff as they developed this offset protocol and appreciate the opportunity to provide our support. Thank you. *(TNC-2)*

Comment: First and foremost, I want to let you know we do support this proposal before you today. It does have its challenges, but so does just about every other program that we introduce initially. So I think it's important that we really move forward, we get this project started, and promote it as heavily as we can within the rice environment. *(CRC-2)*

Comment: Good morning, Chairman Nichols and members of the Board. My name is Ami Gunasekara, I'm advisor to Secretary Ross…So thank you for the opportunity to make a few comments on behalf of Secretary Ross and the Department.

Back in May 2013, I sat with one of your staff, Edie Chang, on a joint legislative hearing of the Assembly Select Committee on Sustainable and Organic Agriculture the Assembly Select Committee on Agriculture and the Environment. We talked about climate change and ag issues.

And at that meeting, I recall stating that we had just begun the discussion on this rice ag offset protocol and it was not without its challenges. Those challenges included establishing implementation reporting and verification procedures that do not jeopardize the credibility of the Cap and Trade Program as State agencies and those who are working at the ground level to reduce greenhouse gases.

A new protocol proposed to the Board must be real, quantifiable and enforceable metrics, while at the same time not compromising yields for food production. As you know, agriculture is a dynamic system that requires much flexibility when developing while entering incentive programs. There was a lot of attention given to establishing the science behind this protocol, and I'm highly biased when I say this as Science Advisor to Secretary Ross, it's always a good thing to have the science guide the development of this and similar incentive programs.

A little over one and a half years later after intensive and productive collaborations with your staff and stakeholders, the major challenges of the rice ag offset protocol have been addressed. The result is the first crop-based ag offset protocol for your consideration today as a staff proposal.

I want to talk a little bit about the fact that recently we established the concept of ecosystems services and agriculture to highlight and explain to a wide audience the many benefits afforded by farmers and ranchers this California. The Environmental Farming Acts Advisory Panel, which I'm liaison to in the department defined the ecosystem services and agriculture as, "The multiple benefits we gain from farming

and ranching, including crop and livestock production. In addition to valuable open space and wildlife habitat, the management decisions and conservation practices of farmers and ranchers also enhance environmental quality."

These benefits in producing safe high quality food products while addressing air quality, including reducing greenhouse gases. We know this ag offset protocol will be well received by the early innovators in rice production in this region. The same innovators are the ones that led the charge to make rice fields available for habitat for many birds that migrate to this region. *(SFA-1)*

Comment: Hi. Good morning, Chairman Nichols and Board members. My name is Adam Smith. I'm the Program Manager of Climate Policy at Southern California Edison.

As I think the first regulated entity testified here today, I'd like to share with you a little bit of the perspective from our side, as well as offer a clear and firm support for the inclusion of the rice cultivation offset protocol in the regulation. *(SCE-1)*

Comment: Madam Chair, members of the Board, Mark Krausse on behalf of PG&E. Very brief just to support the adoption of these protocols and to encourage the development of additional protocols as we enter into the second compliance period in a much expanded market, the need for more control. *(PGE-2)*

Response: ARB thanks the above commenters for their support.

B-2. Early Action Projects

B-2.1. Multiple Comments: In Section 3.11, Early Adoption Projects, of the protocol, there are several inconsistencies between proposed changes to the regulation and guidance in the COP itself:

- According to the regulation and proposed regulatory amendments in 95990(c)(1), early action can occur as early as 2005 (rather than 2006 as specified in the COP) and be eligible through December 31, 2015.
- Per the regulation 95990(c)(3)(C), early action rice projects must be listed with an EAOP by January 1, 2016 (not December 31, 2014 as specified in the COP) and such projects should have until April 30, 2016 to complete verification under the EAOP (95990(k)(3)(D)).
- The Offset Project Data Report (OPDR) submittal deadline included in the COP seems irrelevant, as the OPDR is not part of EAOP, per se, but rather the ARB's compliance offset program. The proposed regulation.

- 95990(k)(5) states no ARBOCs will be issued to early action rice projects after December 31, 2016; this is the deadline that should be incorporated into the COP, if any.

Further guidance may be needed regarding how projects that quantify and claim emission reductions ineligible under the COP are to transition into the COP. Reporting of and claiming such reductions may be required under the early action protocol. Would such projects be able to recalculate/re-report reductions? Would this be done when the project seeks issuance of ARBOCs for early action offset credits? We recommend allowing all projects that meet early action requirements to net out any ineligible reductions when the project seeks the issuance of ARBOCs. *(CAR-1)*

Comment: ARB has responded to previous comments with the addition of an Early Adoption Projects section of the protocol allowing projects listed with an offset Project Registry or ARB prior to December 31, 2014 with activities starting as early as 2006 to be eligible. However, this list date does not provide adequate time for potential growers to be listed and may discourage early adopters from participating in the future particularly when the ARB protocol is not even finalized. *(TGC-1)*

Comment: ACR supports the approval of Early Action protocols, including ACR's *Voluntary Emission Reductions in Rice Management Systems* Parent Methodology, with associated California and Mid-South Modules, as it currently reads in the Proposed Regulation Order. This will allow early adopters of these innovative management practices to be recognized within ARB's Cap-and-Trade Program. ACR has worked extensively with stakeholders in both California and the Mid-South to ensure that our methodology results in real, verifiable, and additional emission reductions. ACR believes that the decision to allow early adopters to enter California's Program will vastly increase the interest and uptake among other growers who will see the benefits of voluntary emission reductions.

It is currently unclear how to reconcile discrepancies in the Early Action section of the Proposed Regulation Order and the Early Adoption section of the Rice Protocol. Section 95990(c)(1) of the regulation text reads: "An early action offset credit may be issued an ARB offset credit pursuant to section 95990(i) if the early action offset credit results from a GHG reduction or GHG removal enhancement which: (1) Occurred between January 1, 2005 and December 31, 2014 or between January 1, 2005 and December 31, 2015 for projects developed under any of the offset quantification methodologies in section 95990(c)(5)(H) or (I)". Section 95990(c)(3)(C) reads "Early action offset projects developed under any of the offset quantification methodologies in section 95990(c)(5)(H) or (I) must be listed by January 1, 2016."

Section 3.11(a) of the draft Rice Protocol reads: "A project may be eligible for ARB offset credits, as specified in subarticle13 of the Regulation, for GHG emission

reductions as a result of implementing eligible project activities in cultivation years that started as early as 2006 if the project is listed with an Offset Project Registry or ARB prior to December 31, 2014 and submits the preliminary OPDR(s) to the Offset Project Registry or ARB by December 31, 2015 for reporting period(s) ended prior to December 31, 2014."

As stated above, we applaud the decision to include the approval of early action rice protocols in the Proposed Regulation Order with a similar timeline for listing and reporting requirements as has been included in all previously adopted Protocols. However, the language in the draft rice protocol indicates a provision for allowing early adopters to have compliance credits issued directly, without converting previously issued, early action offset credits, and using a different timeline for listing and reporting requirements. It is unclear whether ARB's intention is to allow for both options going forward, or whether only one of these mechanisms to include early actors will ultimately be adopted. For consistency with the Early Action on-ramps that ARB has approved for other offset project types, ACR strongly supports the inclusion of an Early Action provision (listing, verification and issuance of EAOCs under an Early Action protocol) in addition to the option to list and verify with an Offset Project Registry under the COP. Also, it is not clear whether "listed" in the above referenced section of the Rice Protocol means that the project must meet the listing requirements of the rice compliance protocol, or the listing requirements of the selected Early Action Offset Program. We believe that the December 2014 listing deadline will present a challenge to projects in development and that it would be more logical for the deadline for listing with an EAOP to be after the date of adoption of the regulation that includes the Early Action provisions as well as adoption of the compliance offset protocol (COP), which are planned for spring and summer 2015, respectively. For consistency with Early Action timelines for other offset project types, we believe a date of December 2015, after the revised regulation and COP have been adopted, for listing with an EAOP is reasonable, which would be followed by a 2016 transition to the COP. *(ACR-2)*

> **Response:** The section the commenters reference in the 45-day Rice Protocol, Subchapter 3.11, Early Adoption Projects, was removed in the proposed 15-day modifications. In the ISOR, ARB proposed two alternatives for the issuance of offset credits for early action projects, both described on page 22 of the ISOR:
>
> 1) ARB would allow Offset Project Operators (OPO) and Authorized Project Designees (APD) to submit OPDRs under the adopted compliance offset protocol and receive ARBOCs for activities that occurred after January 1, 2011; or
>
> 2) ARB would accept early action projects using early action quantification methodologies identified in the Regulation that did not claim emission

reduction credits for sources or activities that ARB determined to be ineligible for crediting under the Regulation.

As stated in the ISOR, ARB's intention was to finalize only one of the above early action methods. ARB staff determined the second method was more appropriate after consultation with early action offset project operators. The early action offset project operators indicated the chosen method would allow early action projects the best opportunity to transition and receive ARB offset credits. Because ARB staff used the second method, Section 3.11 was removed during the subsequent 15-day comment period. Therefore, the deadlines in sections 95990(c)(3)(C) and 95990(k)(3)(D) of the proposed 15-day modifications of the regulatory amendments are correct.

One commenter recommends that ARB allow all projects that meet early action requirements to net out any ineligible reductions when the project seeks the issuance of ARBOCs. ARB staff assumes this comment is in reference to section 95990(i)(H)1. of the proposed regulatory amendments, which states that "One ARB offset credit will be issued for one early action offset credit for each early action reporting period that did not include emission reductions from nitrous oxide (N_2O), soil organic carbon (SOC), reduced fossil fuel consumption and activities ineligible under the Compliance Offset Protocol…" The Regulation contains methodologies for netting out ineligible emission reductions for early action rice cultivation projects requesting ARB offset credits. ARB will issue implementation guidance for the Rice Protocol that will clarify the process for allowing early action projects to convert voluntary offset credits for eligible activities.

B-2.2. Comment: We cannot understate the importance of farmers who try new methods to serving as spokespersons in the tractor dealerships and coffee shops in these farm communities. If allowed to participate, they become the advocates for new methods and the programs that support them. We have had success in our wildlife habitat programs by using these early pioneers to advertise their positive experiences with the Natural Resources Conservation Service, for example, to implement certain beneficial practices. Some new programs tend to eliminate participation by this important group of growers and miss out on the trusted voices they can have in convincing fellow growers to head down a new path. We are very encouraged to see that "early action" is being considered. We are hopeful, however, that the stringency of past recordkeeping rules (not available to them in previous years), will not prevent them from qualifying. Flexibility will be key in this area. *(CRC-1)*

Response: ARB recognizes the important role early projects can play in establishing the workability of a protocol, and is committed to working with early action offset project operators to identify methods for establishing

baseline conditions that meet the requirements of the protocol and that result in ARB offset credits that meet the standards set by the Regulation, Rice Protocol and AB 32 offset criteria.

B-2.3. Comment: The two alternative suggestions proposed in Appendix B demonstrates a willingness on the part of ARB to thoughtfully consider the best approach for inclusiveness and encouragement for growers, particularly those who have been early participants. However, the second method for accepting early action projects using other early action protocols (such as ACR and CAR) lists so many ineligible sources or practices rendering the methodologies unusable in their current form. It is a shame to not include growers who are innovators and eager to participate in emission reduction projects who are well into the development process for verifying emission reductions.

We encourage ARB to not go forward with the existing protocol without including a stronger and clearer consolidation option as well as an inclusive early adopter strategy. *(TGC-1)*

Response: Please see the response provided for comment B-4 in response to the commenter's concern regarding consolidation.

The requirements for early action projects are clearly stated in section 95990(i)(1)(H) of the regulatory amendments, including detailed quantification instructions that were added in the 15-day modifications.

B-3. Eligibility, Quantification, and Reporting of Projects

B-3.1. Comment: Section 1.2 Definition of <u>field</u> stipulates that rice must have been grown on a relevant parcel of land *'for at least one out of the last three cultivation years'.* This is not consistent with requirements set out in Section 3.1 General Eligibility Requirements, in particular Section 3.1(a)(1), which stipulates that to be eligible a project must '*Only include rice fields in the project area that have planted rice for at least two rice cultivation years in the baseline period before the project commencement'*. These field requirements should be consistent and any key eligibility criteria should be clearly identified in Section 3.1, where they are more easily found and referenced. (CAR-1)

Response: ARB staff disagrees with the commenter that there is an inconsistency between subchapters 1.2 and 3.1 of the Rice Protocol. The definition of "field" and the requirement in subchapter 3.1(a)(1) are consistent. The baseline period is a minimum of five years, and is required to contain a minimum of two cropping cycles that each includes one rice cultivation year; this means that the baseline period must include at least two cropping cycles.

A field, as the commenter notes, must have grown a rice crop once within the last three cultivation years. An example of a scenario that would meet both of the above requirements would be:

Baseline Year	Crop
1	Rice
2	Soy
3	Wheat
4	Rice
5	Soy

B-3.2. Comment: In regard to Section 5.2.2.1, Baseline Scenarios Establishment, the following terms need clarification:

- (f) Fertilization events- Further guidance would be welcome for how baseline fertilization events should be recorded. For instance, it is unclear how average values are to be created for fertilization type and application method. *(CAR-1)*

  Response: Due to the multitude of fertilization activities used on a rice project, including different types of fertilizer and application methods, including precision fertilization, it was impossible to put into the regulation how all events will be characterized. Events will be characterized so that the De-Nitrification De-Composition (DNDC) model will accurately quantify emission reductions. Staff will work with the project developer to determine the best way to report fertilization events. In general, if there are two rice years in the baseline and different methods were used in both years, the project operator would input the baseline as two events, each with the actual type and methods used but only half the fertilizer volume actually used.

  As is standard practice for adopted ARB regulations, staff will provide implementation guidance on the protocol to ensure a consistent understanding of the regulatory requirements by all parties. This will include guidance on specific technical issues such as raised by the commenter.

B-3.3. Comment: In regard to Section 5.2.2.1, Baseline Scenarios Establishment, the following terms need clarification:

- (o) Temporary emergency laws- If allowing in the baseline, it would seem important to introduce a similar concession for the project scenario, in particular an exception to the legal and regulatory additionality requirements in section 3.4. *(CAR-1)*

  Response: Once a crediting period has started, a project can continue to receive offset credits for activities newly required by law, regulation or legally

binding mandate until the end of the crediting period, so the concession requested by the commenter already exists. When the crediting period ends, the additionality of project activities will be reevaluated before commencing the next crediting period. When the renewed crediting period begins, the project will not be able to receive offset credits for activities required by law, regulation or legally binding mandate.

ARB staff provided additional clarification of how to consider emergency orders in the baseline in the proposed 15-day modifications to the protocol. Specifically, language was added to the definition of "Baseline Period" in subchapter 1.2 to clarify that "rice cultivation years that occur during a temporary emergency as specified in subchapter 5.1.2.1(o) are included in the baseline period but are not used for determination of the baseline scenario."

B-3.4. Comment: A note at the end of Table 6.1 directs that soil parameters must be 'recorded again' if certain events were to occur, including 'soil movement'. This term needs further definition, as it would seem to potentially capture any type of wind/water erosion of soil, which could occur relatively frequently.

There is no indication as to when any such changes would become significant enough to warrant recording of soil parameters again. There is also no guidance as to how to reconcile any rerecorded data with previously recorded data. Lastly, it is not clear how this requirement would apply if parties were using SSURGO or STATSGO data or data from another eligible published source. For instance, it is unclear whether parties would be required to demonstrate that the published data they have used (from a database or report) was not followed by such an event of 'soil movement', and how they would do so. It may also be helpful to include this note as a footnote to the soil parameter row in the table, so that it appears at the bottom of page 44 or 45. *(CAR-1)*

Response: The intent of this requirement is to have accurate soil data so that the DNDC model accurately quantifies emission reductions. An event that alters soil characteristics so significantly that it will cause a material (>5%) difference in the DNDC quantification would require soil parameters to be recorded again. Due to the number of parameter and the interplay between the parameters it is not possible to identify individual soil parameter thresholds that trigger recording again.

As the commenter notes, the SSURGO and STATSGO databases may not be immediately updated after such an event, so project operators would have to use one of the other methods allowed to determine soil characteristics.

As is standard practice for adopted ARB regulations, staff will provide implementation guidance on the protocol to ensure a consistent understanding of the regulatory requirements by all parties. This will include guidance on specific technical issues such as raised by the commenter.

B-3.5. Comment: In Section 6.2.4 of the protocol "Documentation for Fallow Year, Rotation Crop and Winter Crop," no indication is given as to what (if any) consequences are imposed for not meeting these requirements. For instance, if a project did not meet these document requirements, would it face termination or any other sanctions? It is currently unclear. *(CAR-1)*

Response: Documentation must be sufficient for the verification body to state with reasonable assurance that the Offset Project Data Report (OPDR) is free of an offset material misstatement as defined in section 95802 of the Regulation and in conformance with the Regulation and protocol. Failure to maintain and provide such documentation may lead to either a qualified positive or adverse offset verification statement.

B-3.6. Comment: The second issue is the required calculation of changes in diesel fuel use that may be associated with changes in tillage and planting practices associated with the protocol. While it is understood that since this protocol is limited to methane reductions only, crediting would not be allowed for documented (and presumed verified) reductions in diesel fuel use. However, it should be clarified in the guidance document that if the calculations result in a reduction of diesel fuel emissions, then no penalty would be assessed. *(AFT-1)*

Response: Emission reductions due to fuel switching or reduced fuel usage are not eligible for offset crediting. ARB offsets are not issued for covered sources under the Regulation because the emission reductions are already accounted for under the Cap-and-Trade program. If a project operator reduces fuel usage, the fuel suppler that is a covered entity will report reduced fuel sales and the fuel supplier's compliance obligation will be adjusted based on reduced fuel sales. Since ARB has made a policy decision that offset credits cannot be generated out-of-state for activities that are precluded from generating offset credits in-state, ARB offsets would not be issued for fuel switching or reduced fuel usage that occurs on projects outside of California, even though a fuel supplier outside of California would not be covered under California's Cap-and-Trade program.

In Table 4.1 of the protocol, GHG emissions as a result of equipment use for rice cultivation activities are included as "debit only." This means that if GHG emissions from this activity increase during a reporting period, the increase

would be deducted from the GHG reductions for that reporting period, resulting in fewer ARB offsets issued. If GHG emissions from fuel use decrease, there would be no impact to ARB offsets issued.

B-3.7. Comment: AFT also recommends that the guidance document include the possibility to include in the future other well documented GHG reductions associated with practices to reduce rice methane emissions. *(AFT-1)*

Response: Incorporating additional project activities that reduce GHG emissions would require a full, public rulemaking process and cannot be accomplished in guidance. Guidance can only elaborate and explain parts of the regulation; it cannot add or remove requirements.

B-3.8. Comment: Suggests changes to 10% rule to maximize producer participation The Protocol Section 2.2(c) should be changed to reflect the same intention as described in the Staff Report which states that:

"For avian species nesting in rice fields, to minimize potential effects on habitat for late broods (i.e., families with recently hatched young), the proposed Rice Cultivation Protocol requires that **at least ten percent of a participating rice field's perimeter is not to be shared with** a public road, a field also employing Early Drainage in Preparation for Harvest, or land zoned for commercial, industrial, residential, planning, special, or mixed use. This requirement serves to protect habitat connectivity and would further reduce any potential effects on late broods." (Staff Report p. 39)

Based on this language, the Rice Protocol should be amended as follows:

For wildlife conservation purposes in the California Rice Growing Region, ~~no more than 10%~~ <u>at least ten percent</u> of a participating field's perimeter ~~may be~~ <u>is not to be</u> shared with a public road, a field that is also employing early drainage in preparation for harvest activities or land zoned for commercial, industrial, residential, planning, special, or mixed use to be eligible for crediting. *(EDF-1)*

Response: The language in subchapter 2.2(c) was corrected during the 15-day comment period to accurately reflect the intended eligibility requirement.

B-3.9. Comment: Suggested changes to better explain the Early Drainage activities for rice growers who are new to the practice.

In the Staff Report, we suggest the following on page 10:

~~The protocol requires that in California standing water must be present at least 24 days after fifty-percent heading or 26 days after forty-percent heading.~~

"A grower needs to start draining the field so that there will be no standing water left and the field is still fully saturated at 24 days after fifty percent heading. A specific day cannot be included because the draining time will vary depending on the size of the field. While the participating field will be drained, the soil must still be saturated to ensure that the yield will not be impacted."

Additionally, the language "26 days after forty-percent heading" must be removed, as it does not accurately represent the early drain activity. *(EDF-1)*

Response: Staff agrees with the commenter and incorporated the commenter's suggestion in the 15-day modifications to the protocol in subchapter 2.2 (b)(1). However, it is not possible to change the Staff Report.

B-3.10. Comment: In the Rice Protocol, we recommend the inclusion of a definition of a drained field in Section 1.2(a):

"Drained field" means a field with exposed saturated soil and no standing water. *(EDF-1)*

Response: The term "drained field" does not appear in the protocol, so this suggestion was not taken because the definition is unnecessary.

B-3.11. Comment: Finally, we propose changes to Section 2.2(b).

(b) Early drainage in preparation for harvest activities must follow the requirements below:

(1) For early drainage in preparation for harvest activities in the California Rice Growing Region, there must not be standing water present within a 50-foot radius of the water the inlet check of a participating field 24 days after fifty-percent heading.

(2) While the participating field will be drained, the soil must still be saturated to ensure that the yield will not be impacted.

(3) Rice crop from each field must be sampled to determine fifty-percent heading using the following criteria:

(A) At least three rice crop samples must be taken;

(B) No sample shall be taken within a 50-foot radius of the water inlet or within the area impacted by cold water;

(C) All samples shall be equally spaced in the field;

(D) Each sample must cut all the tillers and main stems in at least a one square foot area with uniform grain maturity;

(E) Samples will be combined then separated into two categories:

1. Heading; and

2. Not heading;

(F) Greater than or equal to fifty-percent of the tillers and main stems must be heading; and

(G) If less than fifty-percent of tillers and main stems are heading, producers will be required to resample until there is at least fifty-percent heading. ~~but greater than or equal to forty-percent of tillers and main stems are heading, resampling is not required. In this case there must be standing water present within a 50-foot radius of the water inlet of a field~~

~~26 days after the sampling date~~

(H) Standard procedure must be used for the collection of field samples.

These procedures must be detailed enough so that any qualified agronomist would be able to accurately repeat the previous determination of fifty percent heading. *(EDF-1)*

Response: ARB staff agrees with the suggestions provided by the commenter and edited the requirements of subchapter 2.2(b)(G) during the 15-day modifications and added subchapter 2.2(b)(H).

B-3.12. Comment: For all of the Project Activities, we propose the following changes to Appendix A to decrease the redundancy in general field information requirements:

(a) General information for each participating field:

(1) Field geographic coordinates, county, and state for each field, and parcel number;

(2) Flooding and drainage dates (during the growing season and during postharvest period);

(3) Begin and end date of harvesting on the participating field;

(4) Post-harvesting residue management (e.g. burning, incorporation or baling) description and dates;

(5) Amount of herbicides applied for the baseline period cultivation cycle and the project scenario cultivation cycle;

(6) Fertilization types, amounts, rate and application methods and dates for each application, including dates of all fertilization events relative to planting date (both pre-flood and top-dressed after flooding);

~~(7) Harvest date;~~

~~(8) Mass of crop residue removed after harvest, the fraction of removed crop residue;~~

(7) Estimate of crop residue remaining in the participating field, depending on the post-harvest residue management practice indicated above.

~~(9) For seeding preparation and enhancement, dates of flooding relative to the planting date;~~

~~(10) Dates of all fertilization events relative to planting date (both pre-flood and top dressed after flooding);~~

~~(11) Dates of all fertilizer applications;~~

~~(12) Rate, type of fertilizer and application method for each fertilizer application; and~~

(~~13~~8) Moisture content for milled rice from the year with maximum observed rice yield; and

(~~14~~9) Dates and depth of all tillage events for preparing the fields for planting and post-harvest residue management.

(b) Additional information for dry seeding projects:

(1) Planting preparation description and date;

(2) Planting date and method; and

(3) The date a field is fully flooded after dry seeding. in preparation for seeding.

(c) Additional information for early drainage in preparation for harvest projects:

(1) The date that the water board(s) were pulled from the weirs or the flooding of the field was stopped; and

(2) Harvest date

(d) Additional ~~I~~information for alternate wetting and drying:

(1) The date that the ~~water~~ board(s) were pulled from the weirs or the flooding of the field was stopped~~; and~~

(2) ~~Harvest date~~

(3) Soil moisture reading date, number of readings, and the results of the readings. *(EDF-1)*

Response: ARB staff agrees with the suggestions provided by the commenter and edited the information requirements during the 15-day modifications to protocol Appendix A.

B-3.13. Comment: It is our understanding that assessments of DNDC model bias (i.e., a significant trend in the residuals between modeled and measured values) have been made by rice-growing region and by project-type. We have inferred this because in the Staff Report accompanying the release of the draft protocol, Alternate Wetting and Drying (AWD) projects are not eligible in the California Rice Growing Region because the model is said to "not have been validated" for this project type in this region. But we're not certain of this, since the data from the model runs used to validate the model have not been made publically available.

We first emphasize that model bias should be assessed for each project type. Lack of model bias for a set of fields representing current practice does not necessarily demonstrate lack of model bias for fields cultivated using the set of new practices being crediting under the protocol. As one example, the DNDC model may not capture the actual effects on emissions induced by the Alternate Wetting and Drying (AWD) practice, even if it models emissions from fields not using this practice without bias. Either project types should be proportionally represented in the data used for model validation, or model bias should be evaluated for each project type individually. Alternatively, CARB staff could provide a description of why the DNDC model used to validate emissions from fields cultivated under current practices will also estimate emissions (without bias) from fields being cultivated under new practices being credited under the protocol. *(STAN-1)*

Response: All data to calibrate and validate the model was included with the Technical Working Group materials for the December 20, 2013, Technical Working Group meeting, which are publicly available on ARB's website: http://www.arb.ca.gov/cc/capandtrade/protocols/riceprotocol.htm.

Since receiving this comment, a new validation of the DNDC model indicates the lack of bias, and that a single fixed structural uncertainty value is

appropriate for all activities and regions. Validation assures that the model accurately reports emissions by comparing the model output to experimentally measured fluxes. In this case, validation has shown that the model is accurately able to predict emissions under a wide range of conditions so there is no reason to expect that individual project activities would be any different. The protocol also has several mechanisms to assure the conservativeness of the reported emission reductions, including: 1) a structural uncertainty deduction that accounts for any uncertainty in the model, and 2) use of the 90th percentile confidence Monte Carlo simulation values for all calculations.

B-3.14. Comment: We understand that the limit that soil moisture must remain above 50% threshold in fields employing the AWD project type is included to reduce the potential for large N2O fluxes from these fields. We urge CARB Staff to make publically available their basis for determining that 50% soil moisture would prevent such over-crediting and its assessment of the state of scientific knowledge of the environmental drivers of N2O spikes from drying fields. *(STAN-1)*

Response: Based on discussions with experts in the field who participated in the Rice Protocol technical working groups, ARB staff determined that 50% is an appropriate soil moisture threshold for alternate wet and drying (AWD) projects.

B-3.15. Comment: Finally, we raise a logistical question about the operation of the protocol. For AWD projects, the draft protocol indicates that if a single reading of soil moisture in a field is either below 50% or is still saturated after drying, then that "area of the rice field" is not eligible for crediting for that cultivation year. How is the corresponding "area" of the field determined? This should be clarified in the protocol text. *(STAN-1)*

Response: The area of the field would be the area below 50% or still saturated. The quantification of this area by the OPO/APD may require additional sampling. The sampling must be sufficient for the verifier to determine, with reasonable assurance, the area was accurately quantified.

B-3.16. Comment: The current draft of the protocol includes the eligibility requirement:

Offset projects developed using this protocol must: Grow rice of the same maturity characteristics during the crediting period as the baseline period.

This requirement could create a disincentive for farmers to switch to shorter duration rice.

Shorter duration rice would use less water, and may result in less methane emissions on average because of a shorter flooding season. It is possible that there could be a business-as-usual shift toward shorter duration rice varieties in both California and the Mid-South, in part, due to the lower water requirements of such varieties. Because of the water use benefits, and possible emissions benefits, we believe that it is important that the protocol avoid creating a disincentive to switch to shorter duration rice.

Because actual farmer practice in the Mid-South during baseline years is not used to determine the baseline, but rather the DD50 model is used, we understand that there should be no reason to require the above restriction [to grow rice of the same maturity characteristics during the crediting period as the baseline period] in the Mid-South. Instead the rice variety used in the project years would be put into the DD50 model for both baseline and project years.

Even if the profits that could be generated from offsets are considered insufficient to create this disincentive at today's offset prices, at higher offset prices this disincentive could become more significant. We recommend that CARB consider a way to allow farmers to shift to shorter variation rice without losing the ability to participate in the offset protocol in both California and the Mid-South. This modification could either be included in the first adopted version of the protocol, or could be adopted as a change later, if offset prices were to increase substantially or if there is evidence of this disincentive affecting farmer choice of rice variety. *(STAN-1)*

> **Response:** The comment regarding the requirement to grow rice of the same maturity characteristics is addressed in the Response to Comments on the Environmental Analysis in Appendix A to this document.
>
> The Regulation requires activities eligible for crediting to be additional to a conservative business-as-usual scenario. ARB staff has not made the determination that switching to a variety with different maturity characteristics is an eligible practice. To make such a determination, the DNDC model would need to be calibrated for these cultivars, which has not occurred. Including this determination and practice would require a separate public process and rulemaking.

B-3.17. Comment: Also, Section 2.2(d) is confusing as written. Please provide clarity on what the eligibility requirement is. *(SCS-1)*

> **Response:** The commenter is ambiguous about what is not clear. However, any field that sends tail water into a dry wetland is ineligible.

B-3.18. Comment: Another problem arises in the methodology for measuring the amounts of carbon dioxide (CO2) stored in forests and as well as the methods for

calculating emissions reductions from the proposed rice cultivation offsets. Although both methodologies are problematic, they share a significant issue in that they use models and estimates to arrive at the amount of CO2 stored in a forest or the amount of methane emissions prevented from different rice cultivation practices. From these estimates, offsets are then sold for exact amounts of avoided emissions. A modeled estimate does not equal an exact amount of emissions. It doesn't add up. *(FWW-1)*

> **Response:** ARB staff disagrees that the use of the DNDC model to estimate emissions from rice cultivation projects is problematic. ARB staff has taken steps to ensure that GHG reductions are conservatively estimated. First, the DNDC model has been validated for all eligible project types. Second, the use of an uncertainty deduction factor conservatively reduces the quantity of offsets issued to a project. Third, the protocol does not allow offsets to be issued for any emission reductions from SOC or N_2O, and debits any increases of these emissions that occur due to project activities.
>
> ARB staff also disagrees that the methodology for measuring carbon dioxide (CO_2) stored in forests is problematic. However, as the commenter did not specify their concern with the methodology, staff cannot provide a more detailed response to this comment.

B-4. Consolidated Reporting

B-4.1. Multiple Comments: For agricultural offset projects to be attractive and cost-effective for growers, their GHG emission reductions often need to be aggregated into quantities large enough to implement and sell to compliance entities. There are two significant drivers important to making these combined projects successful– reporting and verification.

AFT supports that the ARB will allow multiple growers to report their GHG emission reductions on a single Offset Project Data Report (OPDR) (Staff Report p. 20). This will reduce time and paperwork necessary to create a project. There are significant data collection requirements necessary to produce an OPDR from rice cultivation activities with potential costs that could exceed the revenue generated by the GHG reductions per acre. AFT appreciates ARB's effort to create a consolidated reporting template, which should encourage more growers to participate in the protocol. *(AFT-1)*

Comment: For agricultural offset protocols to generate emission reductions, growers need to combine their individual GHG emission reductions into quantities large enough to be cost effective to implement and sell to compliance entities. Many compliance entities will only purchase projects which have the potential to generate

more than 25,000 metric tons. To get to scale, there are two significant drivers important to making these projects successful– reporting and verification.

We are pleased that the ARB will allow multiple growers to report their GHG emission reductions on a single Offset Project Data Report (OPDR) (Staff Report p. 20). The identification of each OPO in the consolidated OPDR will allow the project to continue if there is a problem with one of the OPOs. Consolidating growers in one report will reduce the overall time and paperwork required to create a project. There are significant data collection requirements necessary to produce an OPDR from rice cultivation activities and the reductions per acre are forecasted to be small – less than one ton per acre. Therefore, we applaud the ARB's willingness to create a consolidated reporting template, which will reduce the time required to participate, thus encouraging more growers to undertake GHG-reducing activities. *(EDF-1)*

Comment: Regarding project consolidation, C-AGG acknowledges ARB's inclusion of the provision allowing Authorized Project Designees (APD) to group together multiple producers, or Offset Project Operators (OPO) as a first step towards making project development more economically viable. Project developers acting as APDs can provide the necessary offset program expertise, project development experience, and critical data management approaches and systems to cost-effectively provide offset project opportunities to individual agricultural producers who would otherwise not be able to participate in California's GHG offset program.

Project developers can also provide the necessary up-front investments to develop projects and to translate offset program participation requirements for farmers in a manner that reduces some of the burden on producers, while ensuring project integrity and proper data collection, maintenance, storage, and reporting as required by the Protocol.

The proposed approach also allows the sharing of risk between project developers (APDs) and agricultural producers (OPOs). Agricultural producers participating in Offset Protocols take on risks and uncertainties inherent in undertaking management or practice changes. Experienced project developers will manage the risks of ensuring adherence to the requirements of the Protocol and the process, while agricultural producers manage operational risks. Working together, risks can be mutually spread and managed, and can result in a more robust program for ARB and for APDs and OPOs.

Similarly, allowing multiple producers to report GHG emission reductions under a single Offset Project Data Report (OPDR), as proposed, will reduce the burden on individual producers, and rely on the expertise of experienced project developers with proper data management systems and project management expertise to develop consolidated OPDRs.

The allowance for reporting of crediting periods up to three years is also of benefit, since it will reduce the burden on individual producers and project developers alike. Project developers can then report based on a collective group of growers within a single consolidated project on a timeframe that makes the most sense based on the anticipated number of credited tons per acre of production (likely to be low on an annual basis), as well as potential variability due to weather or climate, for instance. *(CAGG-1)*

Comment: Regarding project consolidation, IETA acknowledges ARB's inclusion of the provision allowing Authorized Project Designees (APD) to group together multiple producers, or Offset Project Operators (OPO), as an important initial step towards making project development more economically viable. The proposed approach allows the sharing of risk between project developers (APDs) and agricultural producers (OPOs). Working together, risks can be mutually spread and managed and result in a more robust offsets program not only for ARB, but also for APDs and OPOs. Similarly, allowing multiple producers to report greenhouse gas emissions reductions under a single Offset Project Data Report (OPDR), as proposed, will reduce the burden on individual producers, while relying on the expertise of experienced project developers with proper data management systems and project management expertise to develop consolidated OPDRs. (IETA-1)

Comment: PG&E welcomes the ARB's provision to allow multiple rice growers to report their emission reductions on a single Offset Project Data Report (OPDR), and the ARB's willingness to create a consolidated reporting template, both of which will help reduce administrative costs and encourage more growers to participate in offset projects. PG&E encourage the ARB to investigate additional ways to simplify the reporting process and lower the barrier to entry for growers to undertake offset projects. *(PGE-1)*

Comment: We understand that ARB staff is proposing to allow for multiple growers to be included on a single Offset Project Data Report. We really appreciate this effort as part of collective efforts to reduce overall administrative costs of this program. It is imperative that these efforts succeed in order to attract reasonable numbers of growers to this program. We welcome the opportunity to work with your staff on the development of a template to achieve this important objective. *(CRC-1)*

Comment: What you have before you today represents the best available science. It maximizes both greenhouse gas reductions and water bird habitat. What is significant about this protocol is it allows multiple growers to report their information in a single group. This is critical, as GHG reductions on a land basis are small and on a per acre basis.

The ability to consolidate their data collection and recording reduces their paperwork and administrative costs. *(EDF-2)*

Response: ARB appreciates the support of the above commenters. ARB staff wishes to clarify that the protocol requires each individual project reported in the consolidated OPDR will still require independent verification resulting in a unique offset verification report and a unique offset verification statement for each project.

B-4.2. Comment: Currently, the Rice Cultivation Protocol and the Cap-and-Trade Regulation are moving in the right direction by allowing Authorized Project Designees (APD) to consolidate projects from multiple Offset Project Operators (OPO) and submit a consolidated OPDR. However, the proposed system does not support the level of consolidation necessary to make the rice protocol economically viable for growers to adopt. This protocol must allow multiple growers to be registered under "one consolidated project" that is represented by one APD, listed as one unique project identification number and should be treated as such in verification. Each individual project/OPO would still be required to gather field data and complete emission reduction calculations on an individual basis.

… We encourage ARB to not go forward with the existing protocol without including a stronger and clearer consolidation option as well as an inclusive early adopter strategy. If growers currently engaged in approved methodologies cannot be included and the protocol does not offer processes that reduce the costs across a group of projects, farmers will not have the economic incentive to participate and will become discouraged from entering the market thus dropping out of the active pilot programs, investors will lose interest in providing the financial resources needed to build a supply of compliance offsets, and service providers (project developers and verifiers) will stop making the investments need to facilitate an efficient market. *(TGC-1)*

Response: As the commenter mentioned, ARB is allowing OPOs to consolidate projects where one APD may submit one OPDR for multiple projects, representing multiple OPOs. Field data collection and emission reduction calculations must be completed for each individual project to maintain the integrity of the offset credits; however, the APD may work with the OPOs to maximize administrative efficiency in this process.

At this time staff has determined that further consolidation would not meet the requirements of AB 32 and the Regulation. ARB staff is committed to further evaluation and potential future amendments to streamline verification and minimize costs while still maintaining the rigorous standards of the protocol, Regulation, and AB 32. To this end, ARB is funding a pilot verification program to identify novel methods for verification that meet these standards.

The commenter's concern regarding early adopter strategy is addressed in comment B-2.3.

B-5. Modeling

B-5.1. Multiple Comments: C-AGG has long supported the use of science-based, rigorous process models as a cost-effective means to measure GHG fluxes and emissions reductions from the agricultural and land use sectors, and has developed and shared white papers and summaries documenting approaches to dealing with structural and measurement uncertainty associated with these approaches. C-AGG lauds ARB for its support of the use of a process-based model in the Rice Cultivation Offset Protocol. The DeNitrification DeComposition (DNDC) model is a valuable tool that simulates complex biogeochemical reactions and estimates resulting changes in GHG fluxes based on these interactions. ARB investments in a simplified dashboard for DNDC inputs and refined data input requirements based on sensitivity analyses will further enhance the rigor and the cost-effectiveness of the tool. *(CAGG-1)*

Comment: IETA supports the use of science-based, rigorous process models as a cost-effective means to measure greenhouse gas fluxes and emissions reductions from the agricultural and land-use sectors. We applaud ARB for supporting the use of a process-based model (i.e., DNDC model) for use in the Rice Protocol. Going forward, ARB may want to consider the development of a simplified dashboard for DNDC inputs and refined data input requirements to further enhance the rigor and the cost-effectiveness of this tool. *(IETA-1)*

Comment: PG&E supports the ARB's efforts to make the DNDC model more user-friendly for project developers. Improvements to the model's interface will reduce administrative costs and support more project development. PG&E encourages the ARB to continue its enhancements to this tool before the Rice Protocol's implementation date. *(PGE-1)*

> **Response:** ARB appreciates the commenters' support. A simplified interface tool is in development. Currently, staff expects a draft tool to be available in fall 2015, and final tool available in early 2016. Availability of the tool does not affect implementation of the protocol or Regulation.

B-6. Verification

B-6.1. Comment: Also, during the pilot verification program, please consider studying the possibilities of holding verifications over several eligible crop years, rather than each one. *(ESI-1)*

Response: The protocol allows for one verification to cover two reporting periods if a project produces less than 25,000 metric tons of GHG reductions in a reporting period. The protocol also allows for one verification to cover up to three reporting periods if this period includes at least one reporting period with an OPDR stating zero GHG emission reductions. Both of the above requirements are found in subchapter 8.1(b).

B-6.2. Comment: Lastly, enacting early drainage activities in preparation for harvest requires that verification bodies send crop experts into each field to verify the stage of growth of the rice at the time of field drainage. Unpredictable growing conditions may require that the crop expert visit fields two or more times to first document the stage of crop growth, and then to document the degree of drainage in the field. The stated purpose for verifying the stage of growth is to ensure that rice yields do not suffer as a result of the new management practice. This requirement seems unnecessarily onerous. It will increase verification costs significantly and potentially interfere with farming operations if the verification body is delayed for unforeseen reasons.

The requirement to verify the stage of crop growth during growing operations puts the verifier in an awkward position of being a crop consultant instead of an unbiased third party.

Maintaining crop yield should be left entirely to the grower. Carbon offset credits are unlikely to reach a price that would tempt a farmer to reduce crop yields in order to develop them. Since yield must be reported, why not apply a deduction in offset credits when there is a significant decrease in yield for weather conditions of that growing season?

In addition, time-stamped photos are already depended upon to document the timing of drainage operations. Perhaps a method can be devised to remotely monitor and document the growth stage of the crop without a series of costly early site visits, if proving the growth stage at the time of field drainage is indispensable. *(ESI-1)*

Response: The language the commenter references in subchapter 8.1(g) requires the verifier's agronomic expert to evaluate the fifty percent heading or one yellow hull requirement. The protocol does not specifically require the verifier or the agronomic expert to witness the sampling activities; they may choose to do so. The OPO/APD may choose to use time-stamped photos, video conferencing, and/or other documentation of the required sampling that allows the verifier and their agronomic expert to assess these requirements remotely, and reach a level of reasonable assurance that the sampling was performed in accordance with the protocol. The OPO/APD should keep in mind that the sampling procedures must be detailed enough that a qualified

agronomist would be able to reproduce the fifty-percent heading determination, as stated in subchapter 2.2 (b)(1)(H).

B-6.3. Comment: Section 8.1 of the protocol, "General Verification Requirements," stipulates that each fallow year, rotation crop year and winter crop must be verified for the activities specified in Table 6.1 and data entered into the DNDC model. It is unclear why this verification requirement applies to years where no DNDC modeling would be necessary and why the verification requirement is not specified anywhere in the protocol for rice cultivation years, where DNDC modeling is required. *(CAR-1)*

> **Response:** It is necessary to verify these fallow years/crops since they are still required by the DNDC model to accurately model project emissions. Subchapter 8.1 of the protocol explicitly states that these non-rice growing time periods must be verified to remove any ambiguity that the data is needed to model project emissions using the DNDC model. Rice cultivation project activities must be verified with reasonable assurance to show that the project is in conformance with the Regulation and does not contain a material misstatement, so it is inherent to the protocol that rice cultivation years must be verified as well as fallow years, rotation crop years and winter crops.

B-6.4 Multiple Comments: Verification is the single largest burden with respect to time and cost of developing agricultural offset projects. According to the Environmental Defense Fund's (EDF) economic analysis, this cost is typically 50% of the total project development cost. In order for growers to participate in this and future protocols, risk-based and randomized verification is necessary. As no voluntary projects have generated offsets from land-based agricultural practices, AFT recognizes the need to test and verify performance of a risk-based randomized verification process.

AFT supports the proposed Rice Cultivation Pilot Verification Program, during which traditional verification and risk-based and randomized verification will be conducted simultaneously and the results compared (Staff Report, p.19).

The design of the Verification Pilot is critically important. AFT encourages the ARB to work with a diverse team in its development. The team should include a statistician, a grower or grower representative, and a representative from one of the Offset Project Registries, and technical staff from CDFA. Results from the Pilot will be precedent setting, impacting verification requirements for future crop-based projects. AFT hopes that the Verification Pilot will demonstrate the efficacy of risk-based and randomized verification for these types of projects. *(AFT-1)*

Comment: Verification is the single largest and most time-consuming cost of developing agricultural offset projects. According to EDF's economic analysis, this cost is typically 50% of the total project development cost. In order for the

agricultural sector to participate in California's Cap-and-Trade program, risk-based and randomized verification is necessary. As no voluntary projects have generated offsets from land-based agricultural practices, we recognize that risk-based randomized verification is a challenging proposition.

We support the proposed Rice Cultivation Pilot Verification Program, during which traditional verification and risk-based and randomized verification will be conducted side-by-side and the results of the two will be compared (Staff Report p.19). Traditional verification could be interpreted by verifiers as requiring a verification body to visit each participating farm. This process is time consuming and expensive and will hinder the development of agricultural offsets. We encourage the development of a risk-based and randomized verification procedure which requires the verifier to review the APD's business and data management processes including the types of supporting evidence, evidence collection and evidence storage in order to develop a thorough risk-based sampling plan. This sampling plan could include confirmation data such as remote sensing. In addition, the inclusion of statistically randomized sampling allows for science-based verification. Under this approach, the verifier would develop a verification plan based upon their assessment of the projects risks in much the same way as verifiers currently develop their Sampling Plan as required under section 95977.1(b)(3)(G) of the Cap-and-Trade regulations. This approach is much more cost effective and can demonstrate the reasonable assurance standard required for offset projects.

As a part of risk-based and randomized verification, the verifier would be required to visit the APD's office in order to conduct a thorough review of all processes, procedures, controls, and records for rigor, consistency, and accuracy. The verifier would interview the OPOs in a project depending upon their risk assessment identified through the Sampling Plan. If the Sampling Plan results in an Adverse Offset Verification Statement or a Qualified Positive Offset Verification Statement, the verifier and the APD would have the opportunity to increase the number of OPOs visited in order to determine errors with the report and to generate a Positive Offset Verification Statement.

The design of the Verification Pilot is critically important. EDF encourages the ARB to work with a diverse team in its development, much as it did with the development of the Rice Protocol. We recommend that the team should include a statistician, an agronomist, a grower or grower representative, a scientist from CDFA, a representative from the UC Cooperative Extension, a carbon project verifier, and a representative from one of the Offset Project Registries.

The results from this Verification Pilot will be useful in developing specific verification requirements for future agriculture-based projects. We believe that this approach is consistent with the design and intent of the Cap-and-Trade regulations and encourage the development of offset projects from rice producers and allow for

greater participation of the agriculture sector in meeting the state's GHG reduction goal. We look forward to additional information on the Verification Pilot Program to be released next year and will encourage our rice growing partners to apply for the Verification Pilot funding.

Despite the steps forward with the Verification Pilot, we are concerned with the cost of requiring "[e]ach project…be independently verified and an offset verification statement issues for each project under the consolidated OPDR" (Staff Report p. 20). Maintaining this requirement will lower the probability of OPOs and APDs participating, given the high cost of verification. We hope that the Pilot Verification Program will demonstrate the value of risk-based and randomized verification for these types of projects.

We are encouraged that the updated Rice Protocol simplifies documentation requirements by providing multiple and flexible options, including "remote sensing, video conferences, digital photographs (dated and geotagged), or digital escrow services." (Staff Report p.18) These verification choices will reduce costs by permitting the use of a variety of low-cost technologies to the benefit of OPOs and APDs. We recommend that ARB continue to investigate, consider, and include other innovative verification technologies as they are developed. *(EDF-1)*

> **Response:** ARB staff recognizes the commenter's concern regarding the cost of verifying individual projects; however, each project is required to undergo an individual verification and receive a separate verification statement. This is required to ensure the integrity of the offsets. OPOs may use any documentation and monitoring methods allowed by the Regulation and protocol that allow the verifier to reach a level of reasonable assurance that the information is accurate, and risk-based sampling will continue to be allowed for verification of individual projects.
>
> ARB staff will work with interested stakeholders and experts during the development, implementation, and review of the verification pilot program to ensure the most useful outcome possible from the Pilot Program. ARB staff hopes that robust participation in the program will allow multiple alternatives to be evaluated.

B-6.5. Multiple Comments: PG&E supports the proposed Rice Cultivation Pilot Verification Program, which could help support the use of risk-based and randomized verification. Risk-based and randomized verification would reduce the costs and administrative burden of verification, and is critical to making participation in agricultural offset projects cost-effective. Therefore, PG&E urges the ARB to proceed swiftly in implementing this pilot. *(PGE-1)*

Comment: Once the Board passes the Rice Protocol, EDF will support ARB efforts to implement the above described Verification Pilot. Streamlined requirements, while still ensuring rigorous execution, will allow the greatest uptake of the practices and the generation of GHG reductions. We are excited to help ARB and CDFA pilot specific reporting and verification requirements, which will make it easier and less expensive for farmers to participate in the Rice Protocol. *(EDF-1)*

Comment: In addition to the protocol, the staff report includes a proposed pilot verification program whereby project implemented in the near future will be able to conduct two verifications. One is set forth in the current regulations, and the second which would identify an alternative and more cost effective verification project.

EDF supports this proposal as verification is approximately 50 percent of the cost of developing agriculture projects. Identifying these cost effective verification processes are critical to the success of growers participating in the Cap and Trade Program. *(EDF-2)*

> **Response:** ARB appreciates the commenters' support of the pilot verification program and encourages their participation in the process of identifying and evaluating alternative verification methods.

B-6.6. Comment: We appreciate the decision to exclude eligibility for projects whose tail water flows directly into a natural wetland that has no standing water, because of the risk that emissions from early drainage would simply be transferred from rice field to dry wetland. How will such an assessment actually be made hydrologically? How does a project verifier verify that tail waters flow into a dry wetland without being there when the wetland is dried? Are photographs or other mechanisms to be used to make this assertion? *(STAN-1)*

> **Response:** The OPO will need to provide documentation to allow the verifier to conclude with reasonable assurance that tail waters were not released into a dry wetland. Examples of documentation could include copies of communications with local, regional or state water agencies, or photographic evidence.

B-6.7. Comment: Since methods for verifying baseline and project inputs have not yet been included in any detail in the protocol draft or accompanying staff report, and are an important but challenging element of protocol effectiveness, we request that methods for verifying the various model inputs be discussed in the TWG with adequate time for consideration and discussion before the protocol is brought to the Board for adoption. *(STAN-1)*

> **Response:** Verification requirements are included in the Regulation. As long as these requirements are met, the verifier may use any methods that allow

for reaching a level of reasonable assurance that the OPDR is free of material misstatements and in conformance with the Regulation and protocol.

B-6.8. Comment: Understandably the protocol strives to be very precise and detailed to verify the reductions to a very high level of confidence. This seems quite reasonable for larger and more predictable emissions from certain industrial facilities. However, it must be recognized that "per acre" emissions from these farms are quite small (on the order of two to three tons CO2 equivalent per acre) and with much annual variation in environmental conditions. With possible average reductions being only a fraction of one ton of CO2 equivalent per acre, we simply question whether the revenue will support such rigorous standards.

We are encouraged to see that ARB is joining forces with the California Department of Food and Agriculture to help fund a pilot verification project designed to evaluate if "more" is actually "better" when it comes to a high level of rigorous farm-scale verification rather than a more statistical and cost-effective approach. Incidentally, we believe that coordination with CRC will be helpful in your staff's efforts to line-up "volunteers" for this project.

CRC provides the following recommendations for your Board to consider that may serve to further improve this Protocol before its final consideration next year:

- Direct staff to coordinate closely with the CRC (in addition to CDFA) to recruit growers to participate in the pilot verification project. *(CRC-1)*

  Response: ARB staff recognizes that the potential for revenue on rice projects is small, and for that reason are planning to evaluate potentially cost-saving alternative verification approaches through the verification pilot program. However, any alternative verification methods must meet the requirements of the current Regulation, or would require a separate rulemaking process to adopt.

  ARB staff has worked closely with California Rice Commissions (CRC) and California Department of Food and Agriculture (CDFA) throughout the development of the protocol and appreciates their efforts to garner growers' support for and participation in the pilot verification program. ARB staff will continue to work with these and other stakeholders in the future.

B-6.9. Comment: The proposed COP includes new allowances and flexibility for verification of project activities "including, but not limited to, remote sensing, video conferences, digital photographs (dated and geotagged), or digital escrow services" (p18, ISOR). It also provides sensible modifications to allow for early verification body contracting, given the unique nature of verifying specific project activities within an agricultural season. ACR recognizes that these changes will allow for a more complete and efficient verification process.

We are pleased that ARB will allow APDs that operate rice cultivation projects on behalf of multiple OPOs to be able to submit a consolidated OPDR under one cover that includes the required information for each project. This will help to streamline the reporting and overhead costs for the individual OPOs. We also understand that at this time ARB will not consider allowing the use of a risk-based sampling approach to verification for OPDRs that cover project activities from multiple OPOs. However, we encourage ARB to keep open its position on this topic and utilize additional resources as they become available, such as the generous pilot program funded by the California Department of Food and Agriculture (CDFA), to objectively assess the merits of a sampling approach to site verification. This sampling approach, which is permitted for aggregated projects under ACR's program, can significantly reduce transaction costs to a level that can catalyze widespread uptake of agriculture and working land offset methodologies, without sacrificing scientific and statistical rigor. ACR would be delighted to assist in designing this pilot program to best take advantage of the three year period in which to compare the current verification model, with a more cost effective verification model. *(ACR-2)*

> **Response:** ARB is committed to streamlining reporting and verification of rice cultivation projects to support maximum participation in the compliance offset program. However, staff has not determined if American Carbon Registry's (ACR) approach for sampling across aggregated projects is consistent with the Regulation. A risk-based sampling approach is acceptable for each individual project.
>
> ARB staff will work with interested stakeholders and experts during the development, implementation, and review of the verification pilot program to ensure the most useful outcome possible. ARB staff hopes that robust participation in the program will allow for multiple alternatives to be evaluated.

B-6.10. Comment: In the proposed Rice Cultivation Protocol, section 8(f) requires that each verification team must include either an agronomist or a local/state agricultural cooperative rice farming advisor. In what capacity will the expert be allowed to serve on the audit team? Will they be allowed to conduct field visits? In section 95978(e) of the Regulation adopted in July 2014, it defines "Direct supervision" of a technical expert as "daily, on-site close contact with an ARB-accredited verifier acting as a supervisor who is able to respond to the needs of the technical expert. The supervisor must be physically present, or within 4 hours travel time and available to respond to the needs of the technical expert". If an ARB-accredited verifier must be on-site or within 4 hours of the expert, then having them conduct field visits is a moot point as this will also increase verification costs as it increases the total assessment time we will need to spend on the verification. *(SCS-1)*

Response: As addressed in the response to Comment B-6.2 of this FSOR, the agronomic expert may, but is not required to, conduct field visits under the direct supervision, as defined by the Regulation, of an accredited verifier. The role of the agronomic expert, as stated in subchapter 8.1(g) of the protocol, is to evaluate the fifty-percent heading or the one yellow hull requirement in subchapter 2.2(b) and the suitability requirements for ratooning as specified in subchapter 3.10, and provide a detailed assessment to be included in the offset verification report. As ARB staff stated in the response to Comment B-6.2, the OPO/APD may choose to use time-stamped photos, video conferencing, and/or other documentation of the required sampling that allows the verifier and their agronomic expert to assess these requirements remotely, and reach a level of reasonable assurance that the sampling was performed in accordance with the protocol. However, as the sampling procedures must be detailed enough that a qualified agronomist would be able to reproduce the fifty-percent heading determination, as stated in subchapter 2.2 (b)(1)(H), the verifier and their technical expert should assess the OPO's sampling and documentation procedures prior to sampling and use their professional judgement to assess whether a physical site visit will be needed to witness the sampling.

Section 95977.1(b)(1)(D) of the Regulation identifies all the activities that must be verified during the site visit. This list includes offset verification services, which can only be conducted under the direct supervision of an accredited ARB verifier. Section 95978(d)(3) of the regulation precluded technical experts from completing offset verification services. Additionally, section 95977.1(b)(1)(D) requires an accredited verifier to make at least one site visit. ARB established rigorous verifier accreditation standards, including extensive training, to assure all verifications are done in accordance with both the Regulation and protocol.

B-6.11. Multiple Comments: In the Compliance Offset Protocol Rice Cultivation Projects, Appendix B: Staff Report, Pg. 20, the first paragraph on page 10 indicates that a single verification can occur for multiple projects covered in one (1) OPDR. Please clarify if each project will require its own verification report or if one report per OPDR will suffice. *(SCS-1)*

Comment: With regards to the specified verification requirements, the deferred verification schedule within the proposed protocol provides improved flexibility for small projects and does represent some cost-savings for eligible projects. However, the protocol specifies that each project within a consolidated OPDR must be independently verified and an offset verification statement issued for each project which undermines the potential cost-savings of consolidating projects. There is a lack of clarity on what constitutes a field visit under a consolidated OPDR and

whether including whether each individual project must undergo a site visit or whether one site visit for a consolidated project will meet requirements.

Our suggestion is to allow a single verification to be performed on the consolidated project through the APD, with a desk review for all the fields/OPOs in the consolidate project, and then a sampling approach, based on type of practice data provided and a verifier's risk assessment, to be used to determine the required field visits. *(TGC-1)*

Comment: It is not clear whether every field must be verified at each verification. If so, a sampling of fields to be visited by verifiers, using methods similar to the risk analysis method in the CAR protocol, should be considered. *(ESI-1)*

> **Response:** ARB staff assumes that the first commenter refers only to Page 20 (not Page 10) of the staff report.
>
> As stated in the paragraph on page 20 of the ISOR referenced by the commenter, "Each project will be independently verified and an offset verification statement issued for each project under the consolidated OPDR." Each project within a consolidated OPDR must have its own offset verification report and verification statement. Risk-based sampling is acceptable, but must be conducted for each project, not across the projects in the consolidated OPDR.

B-6.12. Comment: Compliance Offset Protocol Rice Cultivation Projects, 8.1(i): Clarification is requested on when the Notice of Verification Services & Conflict of Interest forms can be submitted if the OPO/APD contract with the VB before the end of a reporting period. Additionally, if a verifier is allowed to witness project activities, they are very likely to conduct the initial phase of the risk assessment, develop a sampling plan as well as an audit plan. Please elaborate on what the audit team is allowed to do before the OPDR is submitted. *(SCS-1)*

> **Response:** The verifier may contract with the OPO/APD prior to the beginning of the growing season, and they must submit the Conflict of Interest (COI) and Notice of Offset Verification Service (NOVS) at that time. Dates for the site visit can be left blank and updated in the future. The verifier may work with the OPO/APD to determine which project activities are appropriate to witness in person prior to the submission of the OPDR, but should not develop a formal verification plan or sampling plan before submittal of the OPDR. The verifier may witness activities but may not consult. Methods such as video conferencing are acceptable in lieu of in-person witnessing of project activities, at the discretion of the verifier.

B-6.13. Comment: In the compliance Offset Protocol Rice Cultivation Projects, 8.1(i), the OPDR is incorrectly referenced as OPRD in this section. *(SCS-1)*

Response: This typo has been corrected in the 15-day modifications.

B-6.14. Comment: As you know, the cost of verifications for project management for offset protocol can be expensive and costly, which in turn might not provide an adequate incentive to growers. We have discussed using different technologies to enhance this protocol. For example, we've talked about collecting images, and we have smart phones and verified using satellite information. *(SFA-1)*

Response: ARB staff recognizes that the cost of verifications is a consideration for project developers and is committed to exploring various methods for streamlining verification through the pilot verification program. However, adoption of any new methods to streamline verification would require additional public processes through the Administrative Procedure Act (APA) to adopt if they do not meet the requirements of the current Regulation.

B-6.15. Multiple Comments: Regarding cost-effective yet rigorous verification approaches, C-AGG applauds the inclusion in the staff report of the Rice Cultivation Protocol Pilot Verification Program, which will fund the verification of projects using two approaches for a 3 year period. This Pilot Verification Program will allow for a comparative assessment of the outcomes of these two approaches. C-AGG urges ARB to work in a transparent fashion with stakeholders and experts from the agricultural and carbon market sectors to design and document the Verification Pilot approach and requirements. This will ensure that a robust and agreed-upon Pilot Program, which includes participation of an adequate number of APDs and OPOs to show meaningful outcomes, can be developed. It will also ensure that all stakeholders are clear and agreed on the approach and the means by which the comparative assessment will be conducted. Such a comparative analysis, if well designed, will be a valuable and worthwhile endeavor, and will provide for sound information on which to base the development of updates to the Rice Cultivation Protocol, as well as the development of additional agricultural protocols.

C-AGG would like to stress that the Pilot Program needs to engage enough of a sample to show meaningful results from which they can base future policies and decision making. While C-AGG does not have a specific recommendation for the number of farmers that need to be engaged or the number of projects that need to register to achieve this, as a multi-stakeholder collaborative, C-AGG will commit to participate in the design of the Pilot Program and the comparative assessment along with other experts to ensure an acceptable and defensible threshold is established up front.

C-AGG has discussed at great length, and has developed and shared white papers and summaries identifying a science-based verification approach that would utilize both randomized and risk-based sampling to allow for site visits on a scientifically identified sample of farms or fields within a collective project. Project verifiers

already develop Sampling Plans in a transparent and documented approach; C-AGG's proposed approach is fully in keeping with this, and would rely on the rigor of science to reduce verification costs without sacrificing program integrity.

Combined with documentation requirements and monitoring techniques such as the use of remote sensing technologies, date- and time-stamped photographs, and other real-time and technological approaches that exist and or may be under development or even yet-to-be developed (see also next paragraph), these verification approaches can be scientifically and technically rigorous and meet the necessary reasonable level of assurance without being more costly than potential returns on project investment.

C-AGG applauds the incorporation in the latest draft of the protocol the provision allowing for "[o]ther information not identified [in the acceptable project documentation list to] be used to document project activities." This provision confirms ARB's willingness to work with farmers and project developers, as needed, to implement the most cost-effective approaches for ensuring a practice has taken place. This provision also recognizes that a one size fits all approach can be cumbersome and can preclude innovative solutions from being brought to the table.

In the Protocol, ARB requires individual verification statements for every OPO within a consolidated OPDR submitted by a single APD. As discussed above, scientifically rigorous sampling based on risk-based and randomized selection of OPOs to be verified can achieve the necessary verification results. This requirement should be changed to require audits of all OPO data, as collected, managed and stored by APDs, but only site visits as suggested above. If audits reveal errors or indicate problems that may be systemic, then a more in-depth verification could be required. *(CAGG-1)*

Comment: IETA supports cost-effective yet rigorous approaches to verification. We therefore support ARB's Staff Report's inclusion of the Rice Cultivation Protocol Pilot Verification Program, which will fund the verification of projects using two approaches for a 3-year period. This Pilot Program will allow for a comparative assessment of the outcomes of the two approaches. Such a comparative analysis, if well designed, will be a valuable and worthwhile initiative, as well as provide foundational information on which to base the development of updates to the Rice Protocol and the development of future additional agricultural protocols.

In the Rice Protocol, ARB requires individual verification statements for every OPO within a consolidated OPDR submitted by a single APD. We believe this requirement should be changed to require audits of all OPO data, as collected, managed and stored by APDs, but only site visits on a scientifically identified sample of farms or

fields within a collective project.[7] If audits reveal errors or indicate problems that may be systemic, a more in-depth verification could be required. *(IETA-1)*

> **Response:** ARB appreciates the Coalition on Agricultural Greenhouse Gases' (C-AGG) and the International Emissions Trading Association's (IETA) support for the pilot verification program, and is committed to working with C-AGG, IETA and other stakeholders to consider opportunities for streamlining verification, while still meeting the requirements of the Regulation to maintain the integrity of generated offsets and the requirements of AB 32.
>
> As the commenters note, an offset verification statement is required for each individual project, consistent with the Regulation and Rice Protocol. Site visits are required to each project since each project is being independently verified even though a consolidated OPDR is being submitted.

B-6.16. Comment: Section 2.2(C) of the Compliance Offset Protocol Rice Cultivation Projects states that no more than 10% of a participating field's perimeter may be shared with another field that also employs early drainage, however it is not clear how that may be verified if the adjoining field is not participating in the project. Please provide additional guidance on ARB's expectations for verification of this eligibility criterion. *(SCS-1)*

> **Response:** Page 13 of the ISOR explains the performance standard evaluation ARB staff conducted to determine that early drainage is additional to business-as-usual, and is an eligible activity to generate compliance offset credits in both California and the Mid-South. Therefore, it is very unlikely that a field that is adjacent to a project, but not part of a project, would employ early drainage. ARB accredited verifiers would use their professional judgment when determining that an adjacent field is not employing early drainage.

B-6.17. Comment: Additionally, [in reference to Section 2.2(d),] verification guidance on how to assess whether or not the standing water was apparent at the beginning of drainage is requested. *(SCS-1)*

> **Response:** The OPO/APD must provide sufficient documentation or other evidence for the verifier to reach a level of reasonable assurance regarding whether the standing water was apparent at the beginning of drainage. Examples of such documentation or evidence include, but are not limited to written logs, timestamped photographs, video recordings, and teleconferencing.

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[7] *See C-AGG's proposed approach recognizing that project verifiers already develop Sampling Plans in a transparent and documented manner - the proposed approach relies on the rigor of science to reduce verification costs without sacrificing program integrity.*

B-7. Project Data Disclosure

B-7.1. Multiple Comments: During ALM project verifications, the farmers are very concerned about revealing too much information to the general public and other farmers. These disclosures were not as inclusive and revealing as the ones required in the rice protocol. A system to obscure some information from the general public, perhaps by making OPOs anonymous to all but ARB, the project developer, verifier and consultant, should be devised. *(ESI-1)*

Comment: We understand the need for transparency for the Rice Protocol, as with all compliance offset protocols. However, this must also be balanced with protecting confidential business information. Therefore, we recommend the ARB provide detailed guidance regarding the specific grower information which will be made publically available and which data will be maintained by the ARB (Staff Report p. 20). In order to ensure grower participation, it is important to recognize the willingness and ability of growers to protect details of their operation that could be considered confidential business information (CBI). Of particular note and concern is 7.1 (b)(7) – ownership and operational structures. While disclosure to ARB is acceptable, public release of this information could damage a grower's business model and adequate data protection should be provided. *(EDF-1)*

Comment: Additionally, another requirement of the proposed Rice Cultivation Offset Protocol that should be reconsidered in order to ensure the willingness and ability of individual producers to participate is the requirement for full project data disclosure. As currently written, this requirement may divulge proprietary or confidential business information (CBI). Agricultural producers, like most business entities, must protect proprietary and CBI from public disclosure. While some of the information collected from individual producers participating in a consolidated Rice Cultivation Offset Project might be necessary to include in private reports to ARB, the requirement for such data to be made publicly available will lessen or negate the willingness and ability of rice producers to participate in the protocol. Recognizing that rice growers are particularly sensitive to certain forms of CBI, C-AGG recommends that ARB work closely with interested stakeholders, including C-AGG, to identify what types of information may be CBI for rice farmers and to ensure the publication of such information is not mandated by the regulation/COP. Additionally, the Protocol and supporting documents should explicitly identify which information must be disseminated to the public. *(CAGG-1)*

Comment: As currently written, this Rice Protocol's full project data disclosure requirement may divulge proprietary or confidential business information. Like most business entities, agricultural producers must protect proprietary and confidential business information from public disclosure. While some of the

information collected from individual producers participating in a consolidated Rice Protocol project might be necessary to include in private reports to ARB, the requirement for such data to be made publicly available will lessen or negate the willingness and ability of rice producers to participate. IETA therefore suggests that ARB clearly state that "any proprietary and confidential business information will not be publicly shared at any point". *(IETA-1)*

Comment: The protocol describes a long list of data requirements in order for growers to receive these credits, with many elements proposed to be publicly available. Some data seems relatively simple (such as basic information about how they farm the acres enrolled) while other scientific parameters and proprietary business information seems extensive. Also, it should be noted that the more detailed farm business data a farmer is asked to give, the less motivated he/she will be in participating. *(CRC-1)*

Comment: AFT appreciates the need for transparency for the protocol, but also understands the privacy concerns most growers have when reporting business information that may become public. Therefore, AFT recommends that ARB provides detailed guidance regarding the specific grower information which will be made publicly available and which data will be maintained by the ARB (Staff Report, p. 20). In order to foster maximum grower participation, it is important to recognize growers need to protect confidential business information (CBI). *(AFT-1)*

> **Response:** ARB disagrees with the suggestions to conceal public data related to the rice projects. All data in the listing and OPDR will remain public; this is a requirement to support transparency in the compliance offset program, which is voluntary and does not require anyone to participate. The specific information required in the OPDR is stated in subchapter 7.2 of the Rice Protocol.
>
> The above commenters should note that this data would remain public regardless of whether it was published by ARB. For example, section 95987(b) of the Regulation requires the Offset Project Registry (OPR) to make specific information publicly available when a project is listed and when registry offset credits are issued.

B-8. Other

B-8.1. Multiple Comments: While there are only a few approved offset protocols at present; we support expanding the range of eligible offsets to keep costs low

throughout the cap and trade system, including a fertilizer protocol next year. *(SVLG-1)*

Comment: EDF has been investigating what protocol would be the most natural next step, given available data, overall potential GHG reduction potential, applicability to California, and overall feasibility for project implementation. The Staff Report and Rice Protocol provide a strong foundation for future agricultural protocols. In particular these documents provide adequate guidance for consolidated reporting of projects, lay a foundation for risk-based verification through the Verification Pilot, and establish a rigorous standard for modeling reductions. These are important structural necessities for any agricultural protocols and projects to be included in the California Cap-and-Trade market.

The Rice Protocol has established a framework that can enable the creation of a Nutrient Management Protocol. A Nutrient Management Protocol would supply compliance entities with additional high-quality agriculture-based offsets. A Nutrient Management Protocol could easily be designed with crop and geographically based modules. This protocol could start with a California-based crop such as almonds and be rapidly expanded to include corn, leafy greens, sugar beets and barley. To do this, the Quantification Methodologies chapter would be amended to include the new crop quantification equations. The other chapters, such as Assessment Boundary, Monitoring, Reporting, and Verification would all be written to apply to all applications of fertilizer, regardless of crop. This approach would allow the ARB to expand the protocol without having to design a separate protocol for each crop considered. *(EDF-1)*

Comment: In addition, I would encourage the Board to direct staff to develop an offset protocol on nutrient management. We have learned through the development of the rice protocol can be leveraged to the development of a nutrient management protocol, and this protocol can generate significant near-term reductions. *(EDF-2)*

Comment: The use of high-quality offset credits is an effective cost-containment tool and a critical component of a successful cap-and-trade program. PG&E and other stakeholders predict, however, that without additional offset protocols, the supply of offset credits will fall below the 8 percent Quantitative Usage Limit in Compliance Periods 2 and 3. PG&E urges the ARB to adopt the Rice Protocol and the expanded Forest Protocol, and to accelerate its efforts to develop additional protocols to increase and ensure adequate offset supply for future compliance periods.

Additionally, PG&E believes that the ARB's decision to develop the Rice Protocol, which engages the agricultural sector in voluntary emission reduction activities, is an important precedent for other crop-based and model-based offset protocols. *(PGE-1)*

Response: ARB staff will continue to evaluate new protocols for adoption. A white paper that discusses the process for review and approval of compliance offset protocols is available here: http://www.arb.ca.gov/cc/capandtrade/compliance-offset-protocol-process.pdf

B-8.2. Comment: We propose the following corrections to Section 1.2 of the Rice Protocol:

a. Protocol 1.2(a)(4) Butte Sink Wildlife Management Area

b. Protocol 1.2(a)(37) remove the reference to section 4.6, which does not exist

c. Protocol 1.2(c) include Methane CH4

(EDF-1)

Response: ARB staff made non-substantive corrections to the protocol in response to this comment. Specifically, items a. and b. in the comment were changed as the commenter suggested. Methane is defined in the Regulation; therefore item c. was not changed in the protocol.

B-8.3. Comment: One of the items not specifically addressed in those comments relates to section 3.3.E which states that:

Within 30 calendar days of a change of Offset Project Operator due to a change in land ownership, management or tenant occupancy, the new Offset Project Operator must submit to both ARB and the offset project registry (OPR) the following information which will be made public:

1. The name, address, phone number, and E-mail address of the new Offset Project Developer;

2. The name address, phone number and E-mail address of the original offset project operator and Authorized Project Designee, if applicable;

3. The date of change of land ownership, management or tenant occupancy; and

4. The signed attestations found in section 95975(c) of the Regulation.

Monitoring changes in an OPO is no different than monitoring when early drainage has occurred. This is a monitoring activity that should be completed by the project developer rather than the ARB. That said, I would like the board to consider the following comments on this section.

1. The new OPO will have to create a CITSS account in order to participate in the market. This means that the new OPO's contact information will be entered and stored when the CITSS count is created. This information will be public

2. The old OPO's contact information will be in their CITSS account. Does it really need to be submitted again?

3. The 30 day period for reporting these changes is too onerous. 30 days simply isn't enough time to allow the people involved in the transfer of land or a farm to get the required information to the ARB. Monitoring these types of changes is the responsibility and the project developer who should have mechanisms in place to contend with these changes.

The Offset Project Developer is responsible for ensuring that there is continuity in a project when the OPO changes and should have documented procedures to deal with this eventuality in their offset project plan. It appears as though this section would in fact place some of the project developer's responsibilities in the hands of ARB if it left in the protocol.

In summary the intent of this section, proper monitoring of changes in OPO's is a project monitoring activity that must be done by the project developer. Evidence must be collected to demonstrate that a change in the OPO has occurred and this must be available for project verifier to review. I do not believe that the ARB should take on some of the responsibilities of the project developer. *(CCS-1)*

> **Response:** Regarding the commenter's three stated concerns: 1) OPO contact information entered in the Compliance Instrument Tracking System Service (CITSS) is not public; 2) ARB staff agreed and changed the requirement in the 15-day modifications to subchapter 3.3 (e)(2) to require only the offset project name and ARB identification number; and 3) ARB staff agreed and changed the time requirement in subchapter 3.3 (e) for reporting a change in OPO from 30 days to 90 days.

B-8.4. Comment: A common theme among all of the sections is that much of the data, as well as the DNDC user interface, that are needed for members of the TWG and the public to review the protocol have not yet been made available for review. We trust (and request) that CARB make these data available for review during the process of further developing the protocol, well before the release of the protocol for 15-day comments just prior to being brought to the Board for possible adoption. We emphasize that due to the technical nature of the concerns and questions we raise, a 15-day comment period will be inadequate to provide the detailed feedback we hope to provide. In the process of protocol development, it will be important for members of the TWG and the public to have a chance to review the following well

before a final version of the protocol is released: (1) the model run data used to validate the DNDC model, (2) the full set of values of all parameters used in the model that are not chosen by the user, (3) the numerical basis on which each of the project types are deemed additional, (4) a more detailed discussion of methods for validating field-specific baseline and project inputs into the DNDC model, and (5) the DNDC model interface itself. We look forward to discussing these important elements of the protocol in the context of the TWG, and to reviewing them once they are made available for review. *(STAN-1)*

> **Response:** DNDC is a public program available to anyone on the internet (http://www.dndc.sr.unh.edu/). The methods and data used to validate the DNDC model were made public on ARB's webpage (http://www.arb.ca.gov/cc/capandtrade/protocols/riceprotocol.htm) well in advance of the 45-day version of the protocol. ARB has communicated with this commenter and many other stakeholders throughout the protocol development process and provided additional information directly to stakeholders upon request.

B-8.5. Comment: We recommend changes to the way that additionality is discussed in the staff report accompanying the protocol, and request that the data used to make the additionality assessment be made publicly available for each of the project types.

The staff report describes the performance standard approach to additionality assessment as follows: "A performance standard establishes a threshold for greenhouse gas emissions that is significantly better than average, business-as-usual greenhouse gas (GHG) emissions for a specified activity. If a project developer meets or exceeds the standard, the project satisfies the criterion of "additionality." If the project meets the threshold, then it exceeds what would happen under the business-as-usual scenario and generates additional GHG reductions." (Staff Report, p. 12)

The second two sentences in this description of the performance standard approach are problematic. CARB staff has chosen to use a performance standard to assess the additionality of its offset protocols. The last two sentences of the above quotation from the staff report, instead of discussing the performance standard as tool for assessing additionality, is attempting to redefine additionality as the test itself.

Additionality is a commonly used term with regard to carbon offsets, which grows out of the fundamental idea of offsetting. Offsetting allows an emitter to choose to pay someone else to reduce emissions instead of reducing their own emissions. Whether the emitter reduces their own emissions or causes someone else to reduce emissions, the obligation to reduce emissions still must be met. "Additionality" is a requirement of any offset program, and simply means that an emitter can only offset

their emissions if they cause emissions to be reduced elsewhere. If an emitter simply pays someone to do what they were doing anyway, the emitter is buying their way out of reducing emissions, rather than meeting an obligation to reduce emissions. This idea is captured well in the language of AB 32, which states that a requirement of any market based compliance mechanism is that: “the reduction is in addition to any greenhouse gas emission reduction otherwise required by law or regulation, and any other greenhouse gas emission reduction that otherwise would occur” (Cal. Health & Safety Code §38562(d)(2)). Put in other words, does it make sense for California’s global warming law to result in fewer emissions reductions because some rice farmers are already draining their fields early and because some surface coal mines are already capturing their methane for pipeline sales?

Turning back to those two sentences, if a “project developer meets or exceeds the standard” defined by CARB, this does not necessarily mean that the incentive created by the offset program caused the project developer to do this. If a “project meets the threshold” defined by CARB, this does not necessarily mean that emissions are lower than they would have been without the offset program. Meeting a performance test does not necessarily mean that the reductions are additional.

An example may help describe why this is so, and why a simple performance test is useful, but insufficient on its own, to ensure the additionality of the credits generated by a protocol. Even though the numbers of rice growers currently practicing each of the project types included in the protocol are understood to be small, the non-additional emissions reductions from such projects could constitute a significant fraction of total reductions credited under the protocol. First, let’s assume, as was stated at the March 17, 2014 Workshop, that roughly 1-2% of rice fields are currently engaging in early drainage. If over the next 10 years, with the financial support of the protocol, an average of 4% of fields were to drain early, then, assuming each field generates roughly equal amounts of emissions reductions, up to approximately one half of the generated credits could be from non-additional practice – fields that were engaging the practice regardless of the offset protocol. If an average of 8% of fields were to early drain over the next ten years, then up to approximately one quarter of credits generated could be nonadditional during that period. If the Board expects around 8% of fields to engage in this practice after the protocol is adopted, then we would expect, a priori, 25% of credits to be from nonadditional projects. This is assuming that the 1-2% of fields currently engaging in early drainage will continue to do so even without the generation of offset credits.

One more step, beyond a simple performance test, is needed to evaluate whether the protocol meets the additionality criterion. The environmental integrity of a protocol is upheld if the total number of credits generated by the protocol does not exceed the actual effect of the protocol on emissions. That is, the total number credits generated should not exceed the total reductions from truly additional

projects. The application of an uncertainty discount factor provides some buffer within the Rice Cultivation protocol. Net over-crediting would likely be avoided if the under-crediting that is likely to occur because of the application of the uncertainty discount factor counterbalances the amount of over-crediting expected from non-additional projects that will inevitably be credited under the protocol. Such analyses will never be black and white. However, we believe that a performance based approach to additionality testing needs to go beyond a simple "significantly better than average" assessment. Specifically, the test should also include a reasonableness test that broadly assesses whether the protocol is likely to avoid over-crediting its effect on emissions under reasonable assumptions. In addition, ex-post assessments should point to the same general conclusion that the effect of the protocol on new projects is apparent in project trends, and that the total number of credits generated by the protocol were not greater than the estimated effect of the protocol on new activities.

We offer two recommendations. First, we recommend that the last two sentences in the paragraph from the staff report quoted above be deleted so that the statement expresses that the performance standard is used practically to assess additionality, without contradicting the well established meaning of "additionality." Second, we recommend that when CARB applies the performance standard approach, it includes a reasonableness test that broadly assesses whether the protocol is likely to avoid over-crediting its effect on emissions under best-guess assumptions about non-additional crediting, additional reductions expected to result from the incentives created by the protocol, and the under-crediting that is likely to result from conservative emissions reduction estimate methods. *(STAN-1)*

> **Response:** ARB develops standardized rather than project-specific approaches to assessing additionality. The assessment of additionality for the Rice Protocol was done in accordance with the published ARB process for the review and approval of compliance offset protocols, which is posted on ARB's website at the following link: http://www.arb.ca.gov/cc/capandtrade/compliance-offset-protocol-process.pdf, and is consistent with other adopted compliance offset protocols.

> The GHG emission reductions must be additional, or beyond any reduction required through regulation or action that would have otherwise occurred in a conservative[8] business-as-usual

[8] "Conservative," in the context of offsets, means "utilizing project baseline assumptions, emission factors, and methodologies that are more likely than not to understate net GHG reductions or GHG removal enhancements for an offset project to address uncertainties affecting the calculation or measurement of GHG reductions or GHG removal enhancements." Title 17, California Code of Regulations, section 95802(a).

> scenario.[9] In order for ARB to ensure offset credits are additional, ARB would not adopt a protocol for a project type that includes technology or GHG abatement practices that are already widely used.[10]

The document further articulates:

> To assess if a specific GHG mitigation method may have "otherwise occurred," staff will establish if that method is common practice in the geographic area in which the proposed Compliance Offset Protocol is applicable. Where possible, this review would include staff's best estimate of the percent of the technology or mitigation in use for that sector.[11]

The ARB offset program is designed very differently than other offset programs by relying on standardized assessments of additionality established by ARB through a multi-year public development process and not relying on project-specific assessments done by the project developers themselves and then approved by validation or verification bodies. This process is the same for all Compliance Offset Protocols regardless of the size of the projects that are developed.

In a 2013 decision, the Superior Court of California found that ARB's "use of a standardized mechanism is supported by evidence contained in the administrative record" and that it is within ARB's "legislatively delegated lawmaking authority to choose standardized mechanisms." *Citizens Climate Lobby and Our Children's Earth Foundation v. California Air Resources Board* (San Francisco Superior Court, No. CGC-12-519554). In his decision, the judge wrote

> "All parties agree that each and every reduction must be additional. They disagree on how to determine additionality. Determining additionality is difficult, and it is impossible to precisely delineate between additional and non-additional projects. (R24-4-7.) All additionality determinations suffer from this limitation, not just standards-based approaches. Petitioners

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9 "Business-as-usual scenario" means "the set of conditions reasonably expected to occur within the offset project boundary in the absence of the financial incentives provided by offset credits, taking into account all current laws and regulations, as well as current economic and technological trends." Title 17, California Code of Regulations, section 95802(a).

10 California Air Resources Board (2013) California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation. *available at* http://www.arb.ca.gov/cc/capandtrade/compliance-offset-protocol-process.pdf (as referenced in the Staff Report and Proposed Compliance Offset Protocol Mine Methane Capture Projects (2013) at p. 1, *available at* http://www.arb.ca.gov/regact/2013/capandtrade13/capandtrade13isorappa.pdf).

11 Ibid.

> ignore this reality and insist Respondent must use a perfect additionality mechanism or none at all. This argument is inconsistent with the science behind additionality and Petitioners own statements."

This decision was upheld on appeal. (*Our Children's Earth Foundation v. California Air Resources Board* (234 Cal. App. 4th 870 (2015)). Like other Compliance Offset Protocols approved by the Board in 2011, the Rice Protocol utilized a performance standard approach to establish a threshold that is significantly better than average, business-as-usual greenhouse gas emissions for a specified activity. The Rice Protocol uses a technology-specific threshold, sometimes also referred to as a practice-based threshold, where it serves as the "best-practice standard" for rice cultivation. ARB staff assessed the level of deployment of the alternative rice cultivation activities identified in the protocol to not be widely implemented within the population of rice farms that could implement the technologies.

ARB staff is, as always, committed to ensuring the additionality of the offsets generated through Compliance Offset Protocols. In that spirit, ARB staff is committed to periodically reviewing Compliance Offset Protocols to ensure the continued additionality of offset credits generated. ARB staff will continue to monitor changes in the regulatory and technological landscapes and evaluate their impact on the Rice Protocol.

The performance test is used to determine whether an activity in general is additional; it does not establish additionality for individual projects. The commenter provides an example to illustrate their concern, speculating that if 1 – 2% of fields are draining early pre-protocol, and 4% of fields drain early after protocol implementation, up to half of offsets issued from early drainage could be non-additional. However, OPO/APDs are required to provide documentation of activity including drain date during the baseline period to establish baseline conditions. Therefore, if fields implemented project activities during the baseline period they would no longer be eligible for offset credits for the same activity during the crediting period.

Furthermore, the uncertainty factor the commenter references is not designed to buffer against crediting from non-additional projects; rather, it is designed to ensure conservatism by accounting for model uncertainty.

In determining the additionality of the identified activities staff had extensive discussion with experts and reviewed literature that was made publicly available as part of the 45-day regulatory package (see notice here: http://www.arb.ca.gov/regact/2014/capandtradeprf14/capandtradeprf14notice.pdf). The commenter has provided no evidence, only speculation, to

indicate that ARB's analysis is incorrect. Moreover, as indicated in responses to other comments, ARB is unable to "revise" the Staff Report as the commenter suggests.

B-8.6. Comment: Second, in order to facilitate the process of public comment and input on the methods used to estimate emissions reductions by the protocol, it is essential that the details of the DNDC model validation and bias assessments be made publicly available. Publicly available data should include all parameter values (whether default, measured, or taken from a database) that were used for each model run used to validate the model. We have been requesting these data, which are necessary for the public to review CARB's validation of the DNDC model, for over a year now.

At the last TWG meeting, there was discussion about the development of a version of the DNDC software that would be built by CARB specifically for use with the protocol. The current draft of the protocol makes reference to this version of the model software and user interface (Version 9.5, September 2014) as available in the online resources for the Rice Cultivation Projects Compliance Offset Protocol. We understand that this version has not yet been made publically available. *We request that sufficient time be given to the Technical Working Group and interested stakeholders to review this new version of the model when it is available and prior to adoption of the protocol.*

As a part of this release, we request that the Technical Working Group and the public be invited to review the default parameter settings used by the model which are not editable by the user. For instance, while a default of 400 ppm atmospheric concentration is mentioned in the protocol, the yearly rate of increase in this parameter has not been included. Users are given the option of using default value for background NH3 concentration in the atmosphere, but it is unclear what the default value is. Table 6.1, which outlines whether OPO-defined or DNDC default parameters should be used in running the model does not specify what the numeric values are for most of the parameters for which users will use a default value. Presumably a decision must be made about which value to use for each parameter. These parameter settings can meaningfully influence the modeled results and must be made available for public review and discussion within the TWG in an effort to ensure the accuracy of estimated emissions reductions under the protocol. *(STAN-1)*

Response: DNDC is a public program available to anyone on the internet (http://www.dndc.sr.unh.edu/). The methods and data used to validate the DNDC model was made public on ARB's webpage (http://www.arb.ca.gov/cc/capandtrade/protocols/riceprotocol.htm) as part of the Technical Working Group Meeting materials for the 4th Technical Working Group meeting, which was held on December 20, 2013. ARB has

communicated with Stanford and many other stakeholders throughout the protocol development process and provided additional information directly upon request.

The DNDC model interface for ARB projects is currently under development, with a draft version expected to be released in fall 2015 and a final version in early 2016. The interface does not in any way change the implementation of the protocol; it only simplifies calculation of emission reductions which must be independently verified by ARB-accredited third-party verifiers for all projects.

B-8.7. Comment: The second item, if I could transition quickly, is full and complete support for the inclusion of the rice offset present protocol. I think one of the great things that we have is Yachun Chow, who set up the technical working groups, which I think is also something that should continue if possible on the rest of -- as we look at additional offset protocols in the future. Basically, you know, it gave regulated entities like us a chance to see how the sausage was made. I think as we're talking about the invalidation risk and really under understanding what invalidation might look like in each of these protocols, getting a chance to look at the sausage was made like that was incredibly insightful for us. Not just clearing up those definitions about what invalidation is, but letting folks see how it's all put together. *(SCE-1)*

Response: ARB appreciates the commenter's support of the Rice Protocol and the technical working group process. ARB staff agrees that technical working groups were a valuable resource and plans to use them in future protocol development, where appropriate.

B-8.8. Comment: In addition, specific rules and requirements must be specified for invalidation, such that invalidation could be applied to the consolidated project or to the emission reductions from an individual OPO within the group. It is imperative that partial invalidation in a consolidated OPDR can be supported.

Terra, along with other market leaders, innovative farmers, and conservation organizations have worked for years to build voluntary market programs that produce real, permanent, quantifiable, verifiable, and additional offsets as a way to build a "proving ground" for future adoption into California's compliance market. The current momentum in the agriculture offsets market is only due to the fact that farmers can join a consolidated project to diversify costs and risk. *(TGC-1)*

Response: Consolidated projects are not allowed under the protocol or Regulation so it is not necessary to provide clarification on invalidation for consolidated projects. For the consolidated OPDR, because each project will be verified independently, offset credits from a specific project will considered

for potential invalidation independent of the remaining projects in the consolidated OPDR.

B-8.9. Multiple Comments: The challenge that I see mostly with this protocol is one of economics. The potential revenue per acre is quite modest, as we all know. Certainly, less than one percent of a grower's cost of production to do his primary business, which is to produce and sell rice. So for a grower to view this as significant, we're really going to have to make the program as efficient as possible in terms of its implementation and addressing administrative costs. *(CRC-2)*

Comment: It is clearly a highly complex activity to account for, verify and issue these offsets. Based upon the wealth of calculations and modeling required, it is clear that success will be based upon having qualified project developers willing to invest the time and expertise to understand the program adequately to provide this service for rice farmers. Given the modest revenue potential of this program (less than one percent of growers' costs of production), we are concerned about just how attractive this opportunity may be given the complexity of the protocol. We believe that more streamlined approaches may be possible with trade-offs of greater uncertainty deductions, if appropriate, to preserve the integrity of offsets.

CRC provides the following recommendations for your Board to consider that may serve to further improve this Protocol before its final consideration next year:

- Direct staff to collaborate with key stakeholders in efforts to further streamline quantification methodologies and associated data requirements, while preserving the integrity of offsets. *(CRC-1)*

Comment: The District notes the protocol relies on complex modeling and supports CARB's efforts to streamline the quantification process. The current protocol does not lend itself to individual growers readily enrolling projects in the program and will mostly likely rely on other entities to coordinate and manage rice growing acres enrolled in the protocol. The District supports future efforts to streamline the process even further and encourages CARB to work toward developing a more "user friendly" protocol. *(BCAQMD-1)*

Response: ARB staff recognizes that the revenue potential of rice cultivation offset projects is modest and streamlining and efficiency is necessary to make the protocol economically viable for participants. To assist OPO/APDs, ARB is allowing the consolidation of multiple projects into one OPDR through an APD, developing a DNDC interface and quantification tool to simplify emission reduction calculations, and implementing a pilot verification program to test simplified verification methods. Staff has worked closely with stakeholders throughout the protocol development process, and will continue to do so as the protocol is implemented.

B-8.10. Comment: This current protocol is much improved for providing flexibility in the general requirements and documentation requirements for each specific project activity. The inclusion of new monitoring technologies to demonstrate project activities and flexibility on sources of proof will help decrease the burden on growers and increase adoption. *(TGC-1)*

> **Response:** ARB is supportive of the use of new monitoring technologies. OPO/APDs may use any monitoring technique that meets the requirements of the protocol and Regulation and allows the verifier to reach a level of reasonable assurance that the data is accurate and in conformance with the Rice Protocol and the Regulation.

B-8.11. Comment: ARB's inclusion of alternative soil moisture monitoring techniques, as proscribed in Appendix D, is an important step towards integrating verifiable, low-cost, appropriate technologies into new offset project types. This technology, which ACR staff has viewed in operation on-site in the Mid-South, allows for timely management of rice field water depth, and will provide a consistent and efficient means for growers to document water levels on site. ACR fully supports ARB's adoption of these kinds of scientifically effective, appropriate technologies to assist in both offset project management and verification. *(ACR-2)*

> **Response:** ARB appreciates the commenter's support.

B-8.12. Comment: A close look at the proposed rice cultivation offsets and the amendments to the forest offset protocol shows glaring problems. When considering the fact that methane emissions from rice cultivation only represent 0.1% of total GHG emissions in the United States, this confounds the purpose of offsets and initiatives to reduce GHGs — namely, to significantly reduce emissions. Targeting a process that results in minimal emissions and will only allow minimal reductions, exposes this proposed offset for what it really is — a way to add more offset credits to the market regardless of whether they will create legitimate or significant reductions. In fact, California has been increasingly determined to add as many offsets as possible no matter how plausible, even under the best scenario, reductions may be. *(FWW-1)*

> **Response:** Compliance offsets provide an important cost containment mechanism for the Cap-and-Trade program.
>
> The commenter does not provide a reference to support their statement that methane emissions from rice cultivation only represent 0.1% of total GHG emissions in the United States. Nevertheless, ARB staff disagrees with the commenter's assertion that the overall GHG reduction potential from rice cultivation projects confounds GHG reduction initiatives. Offset projects must meet the strict standards of the Regulation and protocol to

be issued ARB offset credits. Therefore, the quantity of offsets that can be generated under the Rice Protocol has no bearing on the quality of those individual offsets.

ARB staff also disagrees with the commenter's assertion that California is determined to add as many offsets as possible. The Regulation limits the use of offsets to 8% of a covered entity's compliance obligation. This in effect limits the total number of offsets that can be used program-wide.

Finally, ARB staff disagrees that the amendments to the Forest Protocol are problematic. However, as the commenter has not detailed their concern, staff cannot respond in detail.

C. COMPLIANCE OFFSET PROTOCOL FORESTRY PROJECTS

C-1. General Support

C-1.1. Comment: Green Assets recognizes and respects the efforts of the ARB to update the Protocol. Incorporating new data is essential for maintaining the integrity and effectiveness of the system. Our team advocates for enhanced accuracy in the Protocol in order for uniform and consistent standards to be applied equitably throughout the country. Green Assets strongly believes that forestry projects across America will be required to produce the volume of ARBOCs necessary to facilitate an effective and efficient cap-and-trade market. *(GA-1)*

Response: ARB thanks the commenter for their support.

C-2. Structured Elements

C-2.1. Comment: Section 3.1(a)(1) of the current proposed Forest Protocol states that ...portions of the project area that have not recently undergone salvage harvesting…

The row under the heading "Structural Elements (Standing and Lying Dead Wood)" within Table 3.1 contains two references to "portions of the project area that have not recently undergone salvage harvesting". It is not completely clear what is meant, in this context, by "recently". The language implies that there are two conditions, the condition of having "not recently undergone salvage harvesting" and the condition of not "undergone salvage harvesting within the previous reporting period". If this is the case, "recently" is implicitly defined as "within the previous reporting period". However, it would be better to have this explicitly clarified. This could be done, if

desired, by replacing "portions of the project area that have not recently undergone salvage harvesting" with "portions of the project area that have not undergone salvage harvesting within the previous reporting period". *(SCS-1)*

> **Response:** Table 3.1, under the heading “Structural Elements (Standing and Lying Dead Wood),” states two possible timeframes salvage harvesting could have occurred: “not recently” and “within the previous reporting period.” All salvage harvesting must fall into one of these two mutually exclusive timeframes; therefore, “not recently” includes any time before the previous reporting period. Therefore, no clarification to the protocol language is required.

C-2.2. Comment: Section 3.1(a)(1) of the current proposed Forest Protocol states assessed during initial and all subsequent verifications from inventory data.

The row under the heading "Structural Elements (Standing and Lying Dead Wood)" within Table 3.1 indicates that compliance with these requirements is "Assessed during initial and all subsequent verifications from inventory data". However, the row also contains references to determination of whether "the quantity of lying dead wood is commensurate with recruitment from standing dead trees" or, in other words, whether there is evidence "that lying dead wood has been actively removed". Strictly speaking, it will typically not be possible to assess whether "lying dead wood has been actively removed" from inventory data, as inventories of lying dead wood are typically not maintained (nor are they required to be maintained by the Protocol). In practice, a determination of this is typically made during a site visit and during meetings with project personnel. Therefore, it is recommended that "Assessed during initial and all subsequent verifications from inventory data" be changed to "Assessed during initial and all subsequent verifications from inventory data and, where relevant, observations from site visits and other verification activities". *(SCS-1)*

> **Response:** ARB staff agrees with the commenter and has modified Table 3.1 to allow observations from site visits and/or other verification activities to be included in the assessment.

C-2.3. Comment: Section 3.1(a)(1) of the current proposed Forest Protocol states …standing dead wood…

The row under the heading "Structural Elements (Standing and Lying Dead Wood)" within Table 3.1 contains numerous references to "standing dead wood", but this term is not defined within the Protocol. It is suggested that "standing dead wood" be replaced with the defined term "Standing Dead Tree Carbon Stocks". *(SCS-1)*

> **Response:** ARB staff agrees with this comment and has made this modification to Table 3.1.

C-2.4. Comment: Section 3.1(a)(1) of the current proposed Forest Protocol states that the Protocol does not have a definition of the term "salvage harvesting", as applied in the row under the heading "Structural Elements (Standing and Lying Dead Wood)" within Table 3.1. It is recommended that such a definition can be provided. The Dictionary of Forestry (http://www.dictionaryofforestry.org/), published by the Society of American Foresters, is one helpful source for this type of definition. *(SCS-1)*

> **Response:** ARB staff agrees with the commenter's recommendation and has added a definition for the term "Salvage Harvest" to Section 1.2(a)(46).

C-3. Even Age Management Modifications

C-3.1 Multiple Comments: We are concerned that specific revisions to the Compliance Offset Protocol for U.S. Forest Projects would preclude us from participating as an offset provider in California's Cap and Trade Program. ORM utilizes even age silviculture to regenerate many of the timber stands that we harvest. We conduct this type of management in a lawful manner in all of the jurisdictions we operate, including California. These regulations require reforestation, green-up and adjacency limitations, and even age unit size limitations.

Section 3.1(a)(4)(A and B) of the revised Offset Protocol for U.S Forest Projects collectively require adjacency requirements that would result in 15 -20 years between harvests, in contrast to the California Forest Practice rules which require between 3-5 years between harvests on adjacent stands. There is no justifiable impact on carbon accounting for this proposed change and the lengthening of the adjacency requirements would have a significant impact on the forest management portion of our business.

This inherently will provide limits on the frequency and size of even age harvests. Placing specific, prescriptive, limitations such as those proposed in Section 3.1(a)(4), are unjustified from a carbon accounting perspective and will limit participation in this market.

ORM recommends that Section 3.1(a) (4) be removed. Landowners enrolled in a carbon offset project have to maintain and enhance carbon stocks on their forests. This inherently will provide limits on the frequency and size of even age harvests. Placing specific, prescriptive, limitations such as those proposed in Section 3.1(a)(4), are unjustified from a carbon accounting perspective and will limit participation in this market. *(ORM-1)*

Comment: Green Assets strongly supports the ARB's goal to promote Natural Forest Management. To achieve this goal, periodic thinning may be necessary,

particularly for managed pine forests. Sustainable harvesting practices encourage forest health and wildlife habitat development while simultaneously reducing the risk of disease and infestation.

The Buffer Area and Basal Area Retention amendments proposed in "Section 3.1(a)(4)(b)" will severely impact forest owners' ability to conduct sustainable harvests and achieve natural forest management. Pairing a proportional Buffer Area with a 50 ftl/acre Basal Area Retention threshold will result in inefficient harvests.

Well-established forest management practices, including seed tree and shelter wood thinnings, often involve the reduction of the Basal Area to less than 50 ft 2/acre. To maintain the health of their woodlands and meet this proposed requirement, it will be necessary for forest owners to carry out smaller, more frequent thinnings. These recurring harvest activities will subject the forest to scarring, soil compaction, and erosion, while potentially hampering the project's ability to reach the species diversity target required by the Protocol. Further, this practice would most likely not be economically viable for forest owners.

Buffer Areas are an important part of effective forest management, and Green Assets observes that a narrower buffer width (i.e. 50', 100', etc.) is more practical for working woodlands considering development of an IFM project, since this method is employed by most management practitioners. If it is determined that the proposed Buffer Area multiplier requirement is appropriate, Green Assets would recommend consideration of a "phased-in" approach, similar to the species diversity requirement, which would allow forest owners the opportunity to achieve this goal over a 25-year period. *(GA-1)*

Comment: As we understand these revisions, we believe they would severely limit the ability of forest landowners who utilize even-age silviculture to participate as offset providers in California’s Cap and Trade Program.

As you know, even-age silviculture is regulated under California’s forest practices rules as a lawful use. Those rules require reforestation, limit the size of even-age units and prescribe adjacency and green-up requirements. Private forest landowners, including among them AFRC members, calculate the sustained yield of their forest lands based on these established regulations as part of their long-range business planning. A change to the cap-and-trade rules that is at substantial variance with the forest practices rules stands to disadvantage these environmentally responsible companies and limit their ability to participate in the carbon market.

Specifically, we read Section 3.1(a)(4) of the revised Offset Protocol for U.S Forest Projects to require adjacency requirements that would result in 15 -20 years between harvests, in contrast to the California forest practice rules which require

between 3-5 years between harvests of adjacent stands. We are very concerned with the width of the buffers that far exceed the adjacency requirements of the forest practices rules. We are unable to find any justification based on beneficial impacts on carbon stores for the restrictions contained in the proposed protocol.

We ask that Section 3.1(a)(4) be omitted from the proposed revisions to the protocols. *(AFRC-1)*

Comment: The new 50 square foot minimum basal area (BA) retention limit is incongruous with accepted silvicultural practices in many areas of the country. For example, hardwood forests throughout the east and the lake states often utilize management techniques reliant on harvests below 50 sq. ft. BA/acre to adequately promote regeneration. In these systems, it is necessary to remove a significant portion of the overstory to establish a robust new cohort of trees and encourage optimal forest structure.

It is clear that the 50 square foot minimum BA retention limit has been based on California Forest Practice Rules, but California BA standards are not an appropriate metric by which to assess forests in other regions of the nation. California forests have BA levels that exceed most areas of the country (4 of the 5 highest BA assessment areas are in California) and while several California forests support BA levels over 150 sq. ft./acre, 27 assessment areas across the country have average BA levels at or below 50 sq. ft./acre.

To help illustrate the problem with applying the proposed blanket standard, consider the following scenario: a harvest occurring in a California redwood or douglas-fir stand could cut all but 1-2 large trees per acre and remain over 50 sq. ft./acre, while the harvest of a single tree per acre in the 27 assessment areas that are already at or below 50 sq. ft./acre would immediately trigger the buffer restriction and could potentially lead to non-compliance with the Protocol.

The new buffer requirements are also problematic as they will unnecessarily constrain a forest owners' ability to maintain economically productive forests while participating in the ARB program. Under the new buffer system, a 40 acre area harvested to a BA below 50 sq. ft./acre would require a buffer nearly nine times the size of the harvest (i.e. >350 acres). These excessive buffer requirements go far beyond buffer prescriptions recommended by forest certification schemes (e.g. FSC, SFI, etc.) and state BMPs.

Proposed Solution:

The previous Protocol language concerning the "Balancing of Age and Habitat Classes" (section 3.8.4 of the current Protocol) should be maintained and incorporated into the revised Protocol in place of section 3.1(4)(A-C). The existing language prohibiting even-aged harvesting on areas greater than 40 acres and

prohibiting near-term harvesting in adjacent stands should sufficiently meet the Board's goals of addressing the environmental and visual impacts of clear cutting and encouraging forest management that results in healthy forests. Additionally, the "sustainable long-term harvest practices" (certification, renewable long- term management plan, etc.) mandate should provide even more evidence that sufficient measures against profligate harvest practices are in place without the need for the excessive new BA retention and buffer requirements. *(BLUESOURCE-1)*

Comment: In Chapter 3.1(4)(A-C) of the protocol, Harvest Intensity Restrictions, the new 50 square foot minimum basal area (BA) retention limit is incongruous with accepted and BMP silvicultural practices.

Proposed Solutions: Retain the current Protocol language concerning the "Balancing of Age and Habitat Classes" (section 3.8.4 of the current Protocol) in place of proposed Section 3.1(4)(A-C). *(BLUESOURCE-1)*

Comment: The new 50 square foot minimum basal area (BA) retention limit is incongruous with accepted silvicultural practices in many areas of the country. For example, hardwood forests throughout the east and the lake states often utilize management techniques reliant on harvests below 50 sq. ft. BA/acre to adequately promote regeneration. In these systems, it is necessary to remove a significant portion of the overstory to establish a robust new cohort of trees and encourage optimal forest structure. Restricting this type of management could also have negative effects on wildlife as the multi-tiered forest ecosystems they foster provide valuable early successional habitat and generally promote greater biodiversity.

It is clear that the 50 square foot minimum BA retention limit has been based on California Forest Practice Rules, but California BA standards are not an appropriate metric by which to assess forests in other regions of the nation. California forests have BA levels that exceed most areas of the country (4 of the 5 highest BA assessment areas are in California) and while several California forests support BA levels over 150 sq. ft./acre, 27 assessment areas across the country have average BA levels at or below 50 sq. ft./acre.

To help illustrate the problem with applying the proposed blanket standard, consider the following scenario: a harvest occurring in a California redwood or douglas-fir stand could cut all but 1-2 large trees per acre and remain over 50 sq. ft./acre, while the harvest of a single tree per acre in the 27 assessment areas that are already at or below 50 sq. ft./acre would immediately trigger the buffer restriction and could potentially lead to non-compliance with the Protocol.

The new buffer requirements are also problematic as they will unnecessarily constrain a forest owners' ability to maintain economically productive forests while participating in the ARB program. Under the new buffer system, a 40 acre area

harvested to a BA below 50 sq. ft./acre would require a buffer nearly nine times the size of the harvest (i.e. >350 acres). These excessive buffer requirements go far beyond buffer prescriptions recommended by forest certification schemes (e.g. FSC, SFI, etc.) and state BMPs.

Proposed Solution:

The previous Protocol language concerning the “Balancing of Age and Habitat Classes” (section 3.8.4 of the current Protocol) should be maintained and incorporated into the revised Protocol in place of section 3.1(4)(A-C). The existing language prohibiting even-aged harvesting on areas greater than 40 acres and prohibiting near-term harvesting in adjacent stands should sufficiently meet the Board’s goals of addressing the environmental and visual impacts of clear cutting and encouraging forest management that results in healthy forests. Additionally, the “sustainable long-term harvest practices” (certification, renewable long-term management plan, etc.) mandate should provide even more evidence that sufficient measures against profligate harvest practices are in place without the need for the excessive new BA retention and buffer requirements. (CAR-1)

Comment: Harvest unit requirements for minimum basal area and modified buffer rules (Protocol section 3.1(4)(A-C)) L&C Carbon does not support the proposed 50 square foot minimum basal area (BA) retention limit or the new buffer requirements. *(LCCARBON-1)*

Comment: While we generally support the proposed Regulatory Review Update, we are concerned with the New Basil Area Standards and Associated Buffered Areas. The imposition of this requirement will make it practically impossible to develop a forestland carbon project which is not located within California and certain other limited areas of the Pacific Northwest. *(TFG-1)*

Comment: Proposed Buffer Width and Buffer Retention Changes in Section 3.1(a)(4)(A and B)

All Landowners across the U.S., including industrial landowners in California, that practice even-age management would likely be precluded from registering their forest carbon using the ARB Compliance Offsets Protocol (U.S. Forest Projects) if the proposed changes are adopted by ARB.

The proposed change goes well beyond the California Forest Practices Act implementing regulations, which for even-age management call for a 300’ buffer around harvest units that is to be retained from 3-5 years. The Protocol change proposes, for a 20 acre harvest unit, an 800’ buffer to be retained until the plantation has 50 square feet of basal area; about 15-25 years of growth. This would drastically change any even-age managed forest’s sustained yield plan and dramatically lower first and second decade harvest levels.

Experience, for even-aged managed forests, in determining carbon sequestration would likely show that adoption of this proposed buffer width and buffer retention change would LOWER sequestered carbon over a 100 year time horizon.

The Existing ARB Offsets U.S. Forest Protocol and Proposed Changes at Section 3.1(a)(4)(A and B) uses the Climate Action Reserve Forest Management Version 3.2 protocol for its foundation. Version 3.2 evolved over about a 5 year period using a diverse Stakeholder Work Group for its development.

At the time commercial harvesting is either planned or initiated within the Project Area, the Offset Project Operator or Authorized Project Designee must demonstrate that the Forest Owner(s) employs and demonstrates sustainable long-term harvesting practices on all of its forest landholdings, including the Project Area" using one of three options.

Further, while the Work Group provided for the 3rd party certification of sustainability, it also provided a mechanism for the local forestry regulating authority to make a buffer change if environmentally necessary. Hence, the U.S. Forest Protocol is already designed to adapt to changes determined environmentally necessary by the local forestry regulatory agencies (in California, the Board of Forestry and Fire Protection).

To our knowledge, the proposed changes to the U.S. Forest Protocol before the Board Dec. 18, 2014 were not developed under a diverse technical team. Further, CalFire and the Board of Forestry, who have the responsibility for forest practices in the State, had no knowledge nor, to our knowledge, were they even contacted regarding this proposal.

CFA do not see any reason that proposed changes to the U.S. Forest Protocol at Section 3.1(a)(4)(A and B) are warranted.

Further, the ARB U.S. Forest Protocol was only adopted three years ago (October 2011). It does not send a positive signal to potential registrants to see such a drastic change as is proposed in Section 3.1(a)(4)(A and B) in such a short time period.

CFA respectfully requests ARB reject the proposed change at Section 3.1(a)(4)(A and B) of the ARB U.S. Forest Protocol. *(CFA-1)*

Comment: While Era applauds ARB efforts to ensure that sustainable forest management is a key element of the US Forest Protocol for Improved Forest Management Projects, we do have some concerns about the practicality of implementing the changes noted. The specific language we refer to is as follows:

If harvesting occurs within the project area, it must meet the following harvest unit size and buffer area requirements:

(A) Harvest units that have less than 50 square feet of basal area retention must not exceed 40 acres in total area;

(B) Open canopy harvest units, harvest units with an area of 3 acres or greater that have less than 50 square feet of basal area retention, must have a buffer area of forest vegetation containing at least 50 square feet of basal area retention must surround the harvest unit. 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;

The requirement of a specific basal area value across all regions that reflects an approved forest retention level does not reflect the wide variability seen in US forests. For many areas of the country the regional average stocking value is at or below 50 square feet of basal area. Also, there are cases where harvests that reduce the stocking levels to lower than 50 square feet of basal area is an appropriate and ecologically sound activity.

A better approach to ensure that forests are sustainably managed is to define appropriate activities on areas of high risk such as steep slopes, riparian buffers, unstable soils, or critical wildlife habitat. The true goal of sustainable forest management is to protect the critical ecosystem services and ecological function of the forest and this cannot be measured through basal area alone. The best way to achieve this goal is to require the adoption and implementation of a sustainable forest management plan that achieves a high level of environmental protection. This is already a feature of the current adopted protocol. *(OCSEES-1)*

Comment: You have proposed to change the ARB U.S. Forest Protocol and adopt Section 3.1.A.4.B.as follows:

B) Open canopy harvest units, harvest units with an area of 3 acres or greater that have less than 50 square feet of basal area retention, must have a buffer area of forest vegetation containing at least 50 square feet of basal area retention must surround the harvest unit. 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.

The Protocol previously required “Stands adjacent to recently harvested stands must not be harvested using an even-aged harvest until the average age of the adjacent stand is at least 5- years old, or the average height in the adjacent stand is at least 5 feet.” The proposed change appears to require a buffer width 40x the area of the harvest unit (1600 acres wide?) until the clear-cut unit reaches 50 square feet of basal area retention, which can be up to 15 years old. This draconian buffer requirement appears nowhere in any state forest practice rules or in any of the certification programs. There is no regulatory precedent or environmental justification for such a proposed change.

The current ARB Compliance Offset U.S. Forest Protocol itself contains strong safeguards for ensuring environmental integrity associated with harvest units. *(NAFO-1)*

Comment: The Existing ARB Offsets U.S. Forest Protocol and Proposed Changes at Section 3.1(a)(4)(A and B) uses the Climate Action Reserve Forest Management Version 3.2 protocol for its foundation. Version 3.2 evolved over about a 5-year period using a diverse Stakeholder Work Group SPI foresters and many other Professional Foresters, environmentalists, Agency representatives and other stakeholders were members.

The Work Group, in development of CAR Version 3.2, which, in part, led to section 3.8.1 in the ARB U.S. Forest Protocol, provided assurance that the any offset project proponent was using sustainable forest practices:

"Sustainable Harvesting Practices"

"At the time commercial harvesting is either planned or initiated within the Project Area, the Offset Project Operator or Authorized Project Designee must demonstrate that the Forest Owner(s) employs and demonstrates sustainable long-term harvesting practices on all of its forest landholdings, including the Project Area" using one of three options.

In this process, the Work Group provided for 3rd party certification of sustainability and also provided an in-place mechanism for the local forestry regulating authority to make a buffer change if one were found environmentally necessary. Hence, the U.S. Forest Protocol is already designed to adapt to any changes determined environmentally necessary by the local forestry regulatory agencies (in California, this is the Board of Forestry and Fire Protection).

To our knowledge, the proposed changes to the U.S. Forest Protocol before the Board Dec. 18, 2014 were not developed under a diverse technical team. Further, CalFire and the Board of Forestry, who have the responsibility for forest practices in the State, had no knowledge nor were they even contacted regarding this proposal. *(SPI-1)*

Comment: The new eligibility requirements contained in Section 3.1(a)(4) A-C appear to be based on requirements of the California Forest Practices rules. While these requirements have proven to be effective and relevant in California, their incorporation into the Protocol may be viewed by OPOs in other states as burdensome and will likely limit the number of viable forestry projects outside of California, including well-managed, sustainably certified properties throughout the country.

The Protocol update requires that, if harvesting occurs, “harvest units that have less than 50 square feet of basal area retention must not exceed 40 acres in total area;” associated buffer area requirements are then stipulated. In many parts of the country outside of California, even-aged management techniques resulting in residual stands greater than 40 acres in size and having less than 50 square feet of basal area per acre are common. These are a result of well-known, successful, and accepted silvicultural methods (e.g., shelterwood harvests, seed tree harvests, and clearcuts), especially in eastern hardwood forests that are dependent on natural regeneration for adequate future stocking.

Limiting these types of silvicultural methods to smaller areas, along with the rigorous buffer requirements will likely sway most OPOs from developing ARB Improved Forest Management Projects on their properties as they seek to promote future stocking of desirable and merchantable species through these management techniques at a larger scale. Low residual stocked stands from even-aged management are well-accepted in the industry and often represent good scientific practice for meeting regeneration targets. Economically viable timber production and forest carbon offset projects may not be able to coexist without permissible, larger scale even-aged management techniques.

Due to limitations imposed on silvicultural practices, projects developed under these proposed requirements may experience mismanagement among certain forest/stand types, leading to an associated change in species composition, especially in oak dominated forests where lower shade levels are required on the forest floor in order to produce adequate natural regeneration. Thus, these requirements have the potential to work against the Protocol’s Natural Forest Management criteria.

In conclusion, ESI suggests a strong consideration for the ramifications these requirements will have on forest projects outside of California before making any final decisions. ESI suggests consulting a panel of foresters outside of California, including those responsible for generating state regulations and best management practices. We believe requirements currently in place from Section 3.8.4 of the adopted protocol (20 October 2011) sufficiently address ARB’s concern of adjacency requirements without over-regulating harvest practices or resulting in inappropriate management of certain forest types. *(FCGHG-1)*

Comment: We were active participants in the development of the U.S. Forest Protocol and support the offset program.

We have been investigating opportunities for carbon projects; however, the proposed changes to Section 3.1(a}(4}(A and B) would preclude our participation in any future projects. This change would require buffers around all harvested units that fall below a certain stocking level (SO sq ft per acre). These buffers would then

have to be maintained until the harvested area meets this stocking requirement. Depending on the timber type and site quality, this could be 15- 25 years.

As an example, a 20 acre harvest unit would have an 800 foot buffer resulting in 106 acres of buffer.

This buffer proposal far exceeds the California Forest Practice Rules that require a "logical yarding unit", but no less than 300 feet, and 3 to 5 year reentry period.

The U.S. Forest Protocol we carefully crafted to ensure high environmental standards were achieved under the definition of "natural forest management". The program requires long-term commitments from timberland owners (100 years) to maintain a level of timber inventory that meets or exceeds the regional average. The proposed very significant change to these standards within 5 years of adoption does not send a positive signal to the potential participants. *(GDRC-1)*

Comment: The proposed changes to the U.S. Forest Projects Compliance Offset Protocol represent a substantial deviation from current forest practice regulation within the state of California and would pose a serious threat to timberland owners that wish to participate in the carbon offset market. Particularly distressing is the language found under Subchapter 3.1 (a)(4) which lacks clarity and seems to indicate buffers and timeframes far beyond those outlined in the California Forest Practice Rules (FPRs).

Subchapter 3.1 (a)(4)(A) states "Harvest units that have less than 50 square feet of basal area retention must not exceed 40 acres in total area; ... " It would seem initially that the 40-acre maximum is in keeping with the FPRs since even-aged regeneration harvests are limited to 40 acres. However, there are several harvest prescriptions that may and often exceed this limitation. Variable retention units can be up to 200 acres in size and frequently will not maintain a minimum of 50 square feet per acre and rehabilitation harvest units do not have an acreage limitation. The FPRs do not limit acreage on rehabilitation harvest units as generally rehabilitating these areas is costly to the landowner and it is within the public's interest to convert these acreages back into productive timberlands. Finally, an Emergency Notification which is used to allow for quickly harvesting forests that are subject to a catastrophic event such as wildfire, windstorm, insects and diseases, etc. are also not subject to acreage limitations under the FPR. This protocol requirement could preclude the use of these publicly beneficial silvicultural prescriptions by making them cost prohibitive.

Subchapter 3.1 (a)(4)(B) describes required buffer widths and results in substantial time constraints for harvesting in buffer areas. The buffer width is determined presumably by multiplying the number of acres of the unit by 40 and that number in feet is the buffer width. For instance a 20 acre unit would require an 800 foot wide

buffer. Such a buffer width far exceeds the present FPRs which requires a minimum of 300 feet. In effect this buffer also creates a time constraint for harvesting the area within the buffer. The buffer area cannot be harvested to a level below 50 square feet of basal area per acre until the original area harvested reaches 50 square feet per acre, which would likely take 15 to 20 years. Present FPRs require no more than 5 years for this time constraint. Another issue with this protocol is that the language makes no mention of either ownership or project area boundaries and therefore would seem to indicate that buffers apply across property lines and possibly within the same ownership but outside the project area. If this is so, then constraints could apply to neighboring properties and benefits would go to the neighbor that gets there first. Additionally it is presumed that harvesting could be precluded if a neighbor completes a 3 acre conversion within a buffer area permanently reducing basal area below the minimum or if a portion of the buffer area is a naturally occurring meadow, lake, rock outcrop or other area incapable of ever growing 50 square feet per acre. The protocol seems to make no exemption for naturally occurring areas of non-forest cover within the buffer area. The buffer requirement, assuming it holds for rehabilitation cuts and Emergency Notifications would be completely unreasonable; hence, unworkable.

It should be noted that the formula described in Subchapter 3.1 (a)(4)(B) does not expressly state that the unit of measurement has to be acres times 40 feet to obtain the required buffer width. The proposed protocol does imply that the unit used would be acres because it states " ... rounded up to the nearest acre ... " Although the industry standard is acres and most frequently harvest area are measured in acres it is not the only unit of measurement for area. Obviously, if the square footage or the number of hectares of the harvest unit were used these would result in dramatically different buffer widths. In order to clarify this potential confusion the protocol should be modified to clearly state that the area of the harvest unit in acres, rounded to the nearest acre, should be multiplied by 40 to obtain the buffer width in feet.

Subchapter 3.1 (a)(4)(C) is also unclear and appears to be irrelevant. The wording indicates that a harvest unit cut prior to project commencement is exempt from subchapters (A) and (B) provided that the requirements of subchapters (A) and (B) are met. It is unclear how the harvest is exempt from requirements if it still has to meet the requirements.

The implementation of the protocol outlined under Subchapter 3.1 (a)(4) would have a substantial negative impact on the financial viability of timberlands where the owner wished to take part in the carbon offset market and wishes to use harvest methods which reduce stocking below 50 square feet per acre in order to improve conifer stocking and increase growth over time rather than maintain lower stocking levels. These protocol requirements represent a major divergence from the current

FPRs and would function as a disincentive for landowners to properly manage their forests as productive timberlands and for carbon sequestration.

It is unclear why the Air Resources Board believes it is necessary to dramatically increase the buffer widths and timing constraints between harvest units well above the existing FPRs. There is no clear justification for the formula of unit acres times 40 feet for a buffer width. What was this basis for developing this formula? It is unclear how these protocol changes will increase carbon sequestration and will likely do exactly the opposite by encouraging landowners to maintain or develop stands that are under utilizing the capacity of the land to store carbon. *(CGLO-1)*

Comment: We have examined the existing forestry offset protocols developed in California and the proposed changes to the protocols and recommend that the ARB remove limitations on landowner silvicultural choices that do not influence carbon stored as part of an offset project. Specifically, the proposed revised protocols require significant buffers around even age management units. Even aged management is a common, lawful practice for our members, and these restrictions are not necessary to ensure that landowners are maintaining the carbon stocks they commit to when enrolling in the program.

The proposed revisions further increase our concern with the Compliance Offset Protocol for U.S. Forest Projects developed in California and would effectively preclude most of our members from participating as an offset provider in California's Cap and Trade Program. *(WFPA-1)*

Comment: New harvest unit requirements for minimum basal area and modified buffer rules: The requirements for basal area retention and rules for buffers around areas reduced below a minimum basal area retention level (§3.1(a)(4)) have changed with no silvicultural, habitat, or hydrologic justification.

Background :

- Under the current Protocol (ARB's FOP October, 2011), only clearcuts were affected by the 40 acre limit. The changes in ARB's proposed FOP would affect uneven-aged management as well.
- The language proposed in §3.1(a)(4)(A) of the new protocol appears to limit the maximum size of harvests that retain less than 50 ft2/ac of basal area to 40 acres.

Implications:

- A three acre block used in a small-group or patch selection harvest in an uneven-age silvicultural system would already have a large proportion of its ground area receiving partial to full shade. Retention of 50 ft2/ac basal area in that patch to avoid the buffer requirement would further limit the ability of

that patch to regenerate shade mid-tolerant and intolerant species and successfully be fully stocked by the new cohort.

- In many parts of the country, even-aged management is a viable way to regenerate a wide range of tree species while giving a competitive advantage to those of little to moderate shade tolerance. The retention requirement of 50 ft2/ac of basal area would affect both clearcuts as well as seed cuts of shelterwoods. 50 ft2/ac of basal area can be between B- and C-level stocking for many forest types, which is typically not low enough to induce significant quantities of desirable regeneration.
- Clearcuts or shelterwood harvest blocks larger than 40 acres are quite common in many parts of the country. Further, creating clearcuts next to other areas that have received heavy harvests, reducing basal area below 50 ft2/ac, is a valid technique to stimulate abundant regeneration across large areas, and attempt to reduce localized effects of ungulate browsing.
- The proposed language is confusing in that it prescribes a buffer width using an area (vs. distance) unit. For example, one interpretation of the language proposed in §3.1(a)(4)(B) would require a 40 acre clearcut to have a buffer 1,600 acres wide applied to its perimeter. On a square-shaped clearcut, the buffer would be applied to each side, resulting in a total buffer width of 1,600 + 1,600 = 3,200 acres (not including the width of the clearcut itself). Even a less stringent application of 1,600 acres of the total buffer size (2.5 mi2) is larger than is justifiable under, for example, silvicultural principles for retention of seed trees of light-seeded species to ensure regeneration throughout all areas of a harvest3, or retention of perch sites for songbirds.

Proposed Solutions:

- While this requirement may be quite applicable to California forests, it may contradict other jurisdictions' regulatory requirements and best management practices. Following the state forestry laws, regulations, and BMPs – often developed with significant input from silviculturalists and biologists familiar with local forests – of the jurisdiction in which the project is located should be sufficient.
- The proposed language could be modified to include that a minimum basal area must be retained within Open Canopy Harvest Units, or a minimum number of stems per acre of seedlings of desirable species well-suited to the site must be present post-harvest. This ensures adequate stocking is maintained over time. For example, Maine Forest Service Rule, Chapter 20 requires a residual of 30 ft2/ac OR 450 stems/acre of acceptable growing stock post-harvest. The stems per acre ensure adequate stocking is maintained over time.
- The proposed language could instead adopt a requirement for a certified forester, or forester otherwise licensed or certified to practice forestry in the

jurisdiction in which the project is located, to provide a silvicultural justification and attestation for harvests that cause stocking to below a certain basal area or stocking threshold.

- Projects that have a management plan and/or are certified by the Forest Stewardship Council, the Sustainable Forestry Initiative, or Tree Farm should be exempt from this requirement.
  Notwithstanding the above, the Protocol's existing rules for Natural Forest Management and Balancing Age Classes are sufficient to ensure environmental integrity. *(SIGLLC-1)*

Comment: The new 50 ft2 basal area retention limit in combination with the buffer requirements are impractical and make offset projects inconsistent with a wide range of forestry treatments that improve the climate resilience, long term productivity, and carbon storage capacity of forests. The various states in which we operate and the sustainability certification that we maintain all specify various harvest unit best practices, including complex adjacency requirements, for the purpose of protection of a wide range of environmental values other than carbon.

Since these requirements are for protecting values already covered by other measures and which are not related to carbon capture or storage, they should not be included in the protocol. *(PCTC-1)*

Comment: Section 3.1(a)(4) of the current proposed Forest Protocol states that harvest units that have less than 50 square feet of basal area retention must not exceed 40 acres in total area; (B)Open canopy harvest units, harvest units with an area of 3 acres or greater that have less than 50 square feet of basal area retention, must have a buffer area of forest vegetation containing at least 50 square feet of basal area retention must surround the harvest unit. 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 (C) Cuts on harvest units that occurred prior to the project commencement date are exempt from subchapters 3.1(a) (4)(A) and 3.1(a)(4)(B) provided that no new harvests occur in the previously cut harvest unit or would be buffer area until the harvest unit cut prior to project commencement meets the requirements of subchapter 3.1(a)(4)(A) and 3.1(a)(4)(B);

SCS is concerned that the addition of this new requirement would be a major disincentive for projects outside of CA. Not only is this requirement extremely burdensome and time-intensive to verify, it does not stipulate an end time for the adjacency requirement. Please clarify how clause B of this requirement is to be met should surrounding areas be under a different ownership or be of a non-forest classification type. *(SCS-1)*

Comment: Our association opposes the proposed compliance language in the protocol regarding buffer width and buffer retention for land owners that practice

even age management. The language as written is substantially more restrictive than the implementing regulations of the California Forest Practices Act. we believe the proposed buffer language in the protocol should be removed. It would just be a complicating factor that would frankly we think the consequence would be nobody could register as it's currently written. And instead, starting in January, we develop a comprehensive frequently asked questions document to accompany the existing protocol. *(CFA-2)*

Comment: We would like to acknowledge ARB staff for the considerable time and effort that's invested in this process. We broadly support the proposed regulatory review updates with a few important exceptions. As was emphasized in nearly 30 public comments prior to this meeting, the new 50 square foot minimum basil area retention limit is excessive and goes well beyond the requirements of the California Forest Practices Act. If adopted, this harvest constraint would require a drastic modification to the sustainable yield plan of almost any even-aged forest in California wishing the participate in the program and would likely preclude the participation of hardwood forests throughout the Easton Lake states as well.

The new proposed buffer system further constrains sound forest management in that 40-acre area harvested to a basil area below 50 square feet would require a buffer nearly nine times the size of the harvest. These excessive buffers go far beyond prescriptions recommended by forest certification bodies by FSC and FSI. Our proposed solution is to maintain the existing protocol language. As was pointed out in the California Forestry Association's comment letter, the existing language was carefully developed over a five-year period by diverse group of expert stakeholders and should not be abandoned. *(BLUESOURCE-2)*

Comment: 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. *(UCB-1)*

Comment: In Section 3.1.A.4.B, Open Canopy harvest units, harvest units with an area of 3 acres or greater that have less than 50 square feet of basal area retention, must have a buffer area of forest vegetation containing at least 50 square feet of basal area retention must surround the harvest unit. 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.

This requirement is excessive. The protocol previously required “Stands adjacent to recently harvested stands must not be harvested using an even-aged harvest until the average age of the adjacent stand is at least 5- years old, or the average height in the adjacent stand is at least 5 feet.” California Forest Practices rules require harvest units to be restocked for 5 years or have stocking at least 3 years old and 5’ tall before adjacent units can be harvested. The proposed change appears to require a buffer width 40x the area of the harvest unit (or the equivalent of 1600 acres wide) until the clearcut unit reaches 50 square feet of basal area retention, which can be up to 15 years old. There is no regulatory precedent or environmental justification for the proposed change.

The current ARB Compliance Offset protocol already contains strong safeguards ensuring environmental integrity associated with harvest units. For example, the Natural Forest Management Criteria gives forest owners the option of choosing to participate in a third-party forest certification program under the Sustainable Forestry Initiative, Forest Stewardship Council, or American Tree Farm programs, and these programs have detailed green-up requirements to address aesthetics and wildlife habitat. In addition, many state forest practices acts have specific green-up requirements to environmental integrity.

In addition to documenting our opposition to the proposed change regarding open canopy requirements, we’d like to take the opportunity to reiterate our comments submitted to the Climate Action Reserve on Draft Version 3.3. CAR Forest Protocol. We feel that the requirement of limiting clearcut size to 40 acres is arbitrary from a climate perspective and significantly undermines potential participation in the California offset market. This size limitation is inconsistent both with standard environmental mitigation measures and the economics of harvesting in many regions of the United States. Additionally, this restriction has no impact in how carbon in forests is accounted for in forestry operations. *(WEYCOMP-1)*

Comment: The requirements for projects that practice even-aged management are inconsistent with forest practices in many areas around the country. The definition of open canopy harvest units as a harvest area of 3 acres or greater that have less than 50 square feet of basal area retention is not accurate for many forests. In some areas of the country, in particular the Southeast, typical uneven-aged silviculture regimes result in basal area retention of less than 50 square feet per acre. Additionally, the proposed spatial and temporal buffer requirements for harvests lack clarity and necessitate more discussion to ensure a thorough understanding of potential management impacts. Please remove these requirements from the protocol or provide rationale for their inclusion and conduct further stakeholder review. *(ECOP-1)*

Comment: We suggest that ARB wave the proposed buffer regulation for forest owners participating under an approved forest certification program, state FPA,

federally approved management plan, or managed forest tax program. Forest owners who choose not to participate in any of these programs could then be required to meet a core criteria in the regulation that also meets the intent of the regulation change. By taking this approach, the compliance protocol enforces management considerations for aesthetics and wildlife program while recognizing that meeting this requirement needs to be appropriate for each project location and forest type. We feel this approach would maintain each project owner's ability to manage for aesthetic impacts and wildlife habitat in a manner that makes sense for their forest and region while meeting the high standard set by the program.

We propose that the proposed language in section 3.1(4) of the draft protocol be changed to the following:

If harvesting occurs within the project area, meet the following harvest unit size and buffer area requirements:

Open Canopy Harvest Units must not exceed 40 acres in total area;

Open Canopy Harvest Units must have a buffer area of forest vegetation that meets one of the following criteria:

- Landowners participating in programs such as State or local forest practices regulations, voluntary forest certification programs such as FSC, SFI, or ATFS, Federally approved forest management plans, State managed forest tax laws, or local forestry regulations must meet or exceed the specified visual management strategies and buffer widths for their project area or;
- Buffers surrounding the Open Canopy Harvest Unit must not contain any forest which qualifies as an Open Canopy Harvest. The width of the buffer area must be a minimum of twice the size of the harvest unit, or 300 linear feet, whichever is less.
- Due to the unique historical management of landholdings and current oversight by the Bureau of Indian Affairs, Tribal forestland held in trust is exempt from Open Canopy Harvest Unit and buffer requirements.

Cuts on harvest units that occurred prior to the project commencement date are exempt from subchapters 3.1(a)(4) (A) and 3.1(a)(4)(B) provided that no new harvests occur in the previously cut harvest unit or wouldSbe buffer area until the harvest unit cut prior to project commencement meets the requirements of subchapter 3.1(a)(4)(A) and 3.1(a)(4)(B); *(FCC-1)*

Comment: However, I'm very concerned about the proposed changes to the even-age management standards, which would create a buffer that is inconsistent with the

California Forest Practice Act and the enabling rules. This is substantially larger buffer and a substantially longer term buffer.

In comparison, the Forest Practice Acts requires a buffer of three to five years post-harvest of an even-aged unit. Our average age units for Green Diamond range from about 22 acres is the average. However, our opening size because of all the buffers is only about 15 acres. To demonstrate what this would do, a 20-acre unit would have a 106 acres of buffer, which you could not enter for 15 to 25 years. That is a substantial impact to the forest land owners and will have a chilling effect on participation of even-age managers.

This isn't -- when we think about this, I know we go immediately to clear cuts. This effects seed tree, shelter wood system, as well as sanitation, salvation, rehabilitation type harvests and the variable retention harvests that are commonly used on the coast also.

I request that the Board delay any action on this. And we're very supportive have working with staff to develop the frequently asked questions, keeping in mind these protocols were developed by Californians mostly for California. And now, we're essentially exporting them to other parts of the state and sometimes outside or other parts of the nation and outside of the nation. And I think it is important to have a series of frequently asked questions and some kind of a process that allows them to understand what the natural forest management goals and the standards of our forest practices are within these protocols. *(GDRC-2)*

Comment: In regards to the proposed amendments to the forest protocol, there number of clarifications and changes that the Nature Conservancy supports, including adjustment to common practice values and the inclusion of Alaska. We will note changes on even-aged management need more discussion. As currently written, it will have unintended consequences for good management, FSC certification and practices in deciduous forests on the east coast. We're happy to hear there will be additional workshops and we recommend a workshop to discuss the issue further. *(TNC-2)*

Comment: Finally, this requirement would add to the cost and complexity of project verification services, as both harvest units and their very large buffer area would need to be verified to ensure the minimum basal area.

We propose lowering the buffer size requirements to ensure compatibility with sustainable forest management practices in the United States. We recommend considering the CA Forest Practice Rules section 913.1, 933.1, 953.1 (a)(3) as a guide for setting this requirement. Further, we recommend changing the minimum basal area retention to 30 square feet to ensure that forest management can also

meet regional ecological goals that also continue to be economically viable. *(ACR-1)*

Response: ARB staff agrees with the above commenters that the proposed modification to the retention requirements and the buffer area would have unintended consequences. The original Forest Protocol adopted by the Board in 2011 contained a 40-acre size limit on stands harvested using an even-aged management silvicultural prescription; this limit has remained unchanged. The proposed changes with regard to harvest intensity, basal area retention, buffer area, and adjacency limits were all intended to clarify what is allowable under even-aged management. The buffer area calculation was meant to be a simplification of the California Forest Practice Rules. ARB selected the California Forest Practice Rules as an appropriate standard because the existing even-aged management requirements in the Forest Protocol adopted by the Board in 2011 were based on the California Forest Practice Rules. One of the goals of the compliance offset program is to encourage the spread of California's high sustainability standards to other states. The compliance offset program is a voluntary program in which entities choose to participate. The implementation of the program requires equitable standards that can be applied equally across all states. The California Forest Practice Rules is the basis for these equitable standards regarding even-aged management.

To the extent feasible, the protocol includes safeguards to help assure the environmental integrity of forest offset projects, which include: requirements for projects to demonstrate sustainable long-term harvesting practices; limits on the size and location of even-aged management practices; and requirements for natural forest management. All projects are required to use management practices that promote and maintain native forests comprised of multiple ages and mixed native species at multiple landscape scales. ARB staff agrees that a strict reading of the buffer requirement would create unreasonably large buffer areas and has made appropriate modifications to reduce the buffer size to be consistent with the California Forest Practice Rules buffer requirements. The 50 square foot basal area was taken directly from section 912.7 of the California Forest Practice Rules.

ARB staff did not intend to place additional requirements on adjacency and buffer limits, only to clarify the existing language to specify criteria for the project operator and verifier to meet. However, ARB staff acknowledges the buffer requirement was incorrect and that other modifications have caused confusion. As a result, staff has provided modifications to these sections that align with the California Forest Practice Rules. These revisions were presented in the 15-day version of the Forest Protocol.

The commenters also discuss their concern that the proposed changes to the Forestry Protocol would result in reduced offset supply. While offset supply is an important factor, assuring that all ARB offsets represent real, permanent, quantifiable, verifiable, enforceable, and additional GHG emission reductions and GHG removal enhancements is also important. ARB staff has taken several steps to address offset supply concerns. In addition to the four originally approved protocols in 2011, ARB has added a Mine Methane Capture offset Project Protocol, is proposing to add a Rice Cultivation Projects Protocol, and extend the geographic scope of the current Forestry Protocol to include Alaska. Staff will continue to evaluate and propose new offset protocols that would generate compliance offset credits that meet AB32 criteria. It is also important to note that there is no indication that all possible projects have been implemented under the existing protocols. Offset projects are responsive to the price of offsets. If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, ARB staff expect project developers would respond by undertaking more projects with the expectation of higher returns on investment.

C-3.2. Multiple Comments: However, recently proposed changes regarding even-aged management and buffer spatial requirements may have the unintended consequence of preventing participation of over half of the private timberland base in California. The proposed changes may also conflict with the Forest Practice Rules of this State. This is important, as the Notice of Hearing and supporting documents states:

> "During the process of developing the proposed regulatory action, ARB conducted a search for any similar regulations on this topic and has concluded that these regulations are neither inconsistent nor incompatible with existing state regulations."

The Board of Forestry and Fire Protection has unanimously asked me to forward this concern to you. In addition, given the importance of this issue, they urge a delay in adopting amendments to the protocol to allow for additional stakeholder input, and to assure that our regulatory programs are not in conflict. *(BFFP-1)*

Comment: Silvicultural restrictions related to even-aged management should not be more stringent than the California Forest Practice Rules. Section 3.1(a)(4) of the proposed Protocol adds new restrictions that function to define even-aged management by basal area retention and require substantial additional adjacency requirements for such even-aged management.

New Forests supports the presence of natural forest management and sustainable harvesting practice requirements in the Protocol. Not all forests are managed

sustainably, and those that are not should not supply offsets into the California market.

However, we view the California Forest Practice Rules – the most stringent in the nation – as the benchmark for assurance of sustained yield and conservative silvicultural practice. The new language in Section 3.1(a)(4) well exceeds the adjacency and green-up requirements of the Forest Practice Rules, and such adjacency restrictions would in many circumstances be impossible to implement in commercial forestry, particularly in less biomass dense forest types outside of California. Furthermore we do not believe that there is published science that demonstrates that the proposed level of adjacency requirements are necessary to achieve ecological outcomes in the public interest, such as reduced sediment transport from timberland or improved wildlife habitat.

We recommend that the natural forest management criteria and sustainable harvesting practices embedded in the protocol not be more limiting or stringent than the California Forest Practice Rules. We further recommend that ARB solicit comment at a public workshop for 15-day changes related to this matter. *(NFI-1)*

> **Response:** ARB staff agrees that the California Forest Practice Rules should be the basis for the even-aged management requirements of the protocol. ARB staff did not intend to place additional requirements on the even-aged management limits, only to clarify existing language to provide criteria for the project operator and the verifier to meet. However, ARB staff acknowledges the buffer requirement was incorrect and that other modifications have caused some confusion. As a result, ARB staff has made significant changes to this language in response to stakeholder comments. ARB staff worked closely with the Board of Forestry and Fire Protection to ensure consistency with the Forest Practice Rules, resulting in the 15-day changes that were incorporated in the protocol update.

C-3.3. Comment: The update to the even-aged language in the protocol includes both some important clarifying language and some policy updates. The Reserve is supportive of the clarifying language, which aligns the even age area limitations in the protocol (40 acres) to even age rotational harvests that have occurred since the project commencement date and provides a verifiable definition to the term ‘even-aged management.” The Reserve recommends additional analysis and the engagement of stakeholders to further consider the policy language, which defines increased spatial and temporal buffers for even-aged harvest units.

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The clarification that even-aged area limitations apply only to harvest units that have occurred since project commencement is welcome, as the Reserve feels this was the original intent of these limitations.

The Reserve has worked with the Air Resources Board to clarify this intent on projects where verifiers have questioned whether a project with mature, even-aged forest stands in excess of 40 acres that were initiated naturally, or through silvicultural activities prior to the project commencement, would be in compliance with the protocol. The Reserve believes the updated language appropriately addresses this concern.

The Reserve also generally supports the provision of a definition for the term 'even-aged management.' The term does not have a universally understood definition, particularly with objective and verifiable terms. The provision of a verifiable definition will serve to avoid unnecessary delays and costs associated with verification challenges. The proposed language uses 50 square feet of basal area harvest retention as a threshold criterion in defining harvested stands that are even-aged in nature or uneven-aged in nature. The Reserve understands the nexus between the 50-square foot threshold and the California Forest Practice Rules where, under certain conditions, 50-square feet of harvest retention represents the lowest retention level not subject to harvest area constraints. The Reserve supports this definition for application in California and states with similar forest types, but also recommends that the Air Resources Board perform additional analysis and stakeholder consultation to determine if the 50-square foot retention threshold is an appropriate dividing line between even-aged management and uneven-aged management throughout the United States.

Within these generally helpful clarifications, however, the proposed protocol update includes provisions that seem to reflect an unstated policy objective to further disperse the implementation of even-aged rotations and increase the time before stands adjacent to even-aged harvests can be harvested. Whatever the merits of these changes, they could have significant implications for how projects are managed. Where updates to the protocol introduce new policy objectives, the Reserve believes the Air Resources Board should clearly define the objectives and undertake a deliberate consultation process to ensure that they are met while limiting unintended consequences.

The current protocol has limitations to the implementation of even-aged harvests 'adjacent' to recent even aged harvests. However, the term 'adjacent' lacks verifiable terms and is ripe for verification disputes. In discussions the Reserve has had with verifiers, debate has arisen whether a linear strip of trees in an otherwise even-aged harvest unit in excess of the 40-acre limit would be sufficient to comply with the even age area limitations. Clearly, additional definition is needed to clarify this issue. The Reserve believes that it is appropriate to work toward verifiable

terms for creating adjacency buffers that meet the intent of the protocol. In this case, the clarifying solution is in excess of the California Practice Rules. As such, the policy objectives associated with this update need definition and subsequent analysis and stakeholder input.

The protocol currently has language in verifiable terms that specifies the condition a recently harvested even-age unit must be in before an adjacent stand can be harvested with even-aged management. The draft language links the temporal delay in harvesting adjacent stands to the definition of an even-age harvest unit being proposed (less than 50 square feet). While establishing uniformity in the verification criteria has some merit, achieving 50 square feet of basal area on a recently harvested stand would require considerably more time than requirements in the California Forest Practice Rules. Similar to the increased spatial buffers in defining adjacency, the temporal delay in harvesting adjacent stands needs a clear policy rationale and subsequent analysis and stakeholder input. *(CAR-1)*

> **Response:** ARB appreciates the commenter's support. ARB staff agrees that the protocol could benefit from additional clarification regarding even-aged management. ARB staff did not intend to further disperse even-aged rotations or increase rotation lengths. The intent was to provide verifiable standards which both the project operator and verifier can meet based on the even-aged management requirements in the California Forest Practice Rules. As a result, ARB staff has made significant changes to the even-aged management section. ARB staff worked with the Board of Forestry and Fire Protection to ensure consistency with the Forest Practice Rules, resulting in the 15-day changes that were incorporated in the protocol update.

C-3.4. Comment: Second, we look forward to continued dialogue with ARB staff on issues related to base line revision and even aged management, which have been mentioned by other commentors, with the goal of making sure that there are strong rules and sustainable forest management without making the protocol more stringent than the California forest practice rules, which we view as a benchmark of sustainable forestry nationally. *(NFI-2)*

> **Response:** ARB staff agrees with the commenter. ARB staff has worked with stakeholders and the Board of Forestry and Fire Protection to ensure consistency with the Forest Practice Rules, resulting in the 15-day changes that were incorporated in the protocol update.

C-4. Logical Management Unit (LMU) and Minimum Baseline Level (MBL)

C-4.1. Multiple Comments: A change to the Minimum Baseline Level calculation ("Equation 5.5") has been proposed in "Section 5.2.1(d)(1)" of the Protocol. This

amendment involves determining the weighted average of aboveground standing live carbon stocks within a Logical Management Unit (LMU) for projects whose initial above ground standing live stocks are above common practice, which would include a forest owner's entire forest landholdings.

While this proposed amendment allows determination of LMU stocks based on stratified vegetative sampling, it is likely that a carbon-specific inventory would need to be conducted on all woodlands owned by a forest owner to obtain a more accurate statistic for this calculation. Forest carbon offset project development currently involves an extensive lead time, and the additional resources necessary to complete this effort could potentially discourage the development of a viable project.

The new Minimum Baseline Calculation also impacts project verification. It is unclear if verifiers would be required to gather on-site data from the rest of the LMU, or if a desk review would meet the requirements of the Protocol. If this requirement proves particularly time-consuming, it could potentially negatively impact the capacity of the verifiers to meet the 11-month deadline specified in the ARB Regulation.

Green Assets strongly observes that further research on this proposed amendment is necessary to develop the most accurate Protocol. *(GA-1)*

Comment: The new method for determining minimum baseline level (MBL) for IFM projects with initial carbon stocking (ICS) above common practice (CP) will run counter to the program's climate goals. If a landowner is forced to use an MBL above CP, due to lower stocking levels on other holdings in the same assessment area, a carbon project may not be feasible. This approach disincentivizes landowners from establishing forest projects on their most highly stocked (and likely to be harvested) acres and thereby forgoes the meaningful climate benefits that would have been associated with preventing aggressive harvesting on these acres for the next 100+ years.

In addition, this rule change will be impractical for implementation and extremely difficult to verify. At the center of the problem is the concept of the logical management unit (LMU), which defines the bounds of the geographic region over which a landowner must consider stocking levels on their other holdings outside the Project Area. Unfortunately, the method prescribed for determining the LMU requires extensive additional data collection on the part of the landowner (which will often be cost prohibitive) and necessitates a surfeit of subjective judgments. Once the LMU is established, the process of verifying the bounds, stocking, and management on the LMU will cause the cost and time involved in project verification to balloon, and may make verification practically impossible. Indeed, in cases where the LMU extends over an acreage many times the scale of the project area itself, the cost and difficulty of verification will likely compel landowners to abandon any consideration of participating in the program.

Proposed Solution:

The previous Protocol's method of establishing MBL for IFM projects with ICS above CP (equation 6.5 of the current Protocol) should be maintained and incorporated into the revised Protocol in place of equation 5.5. As both the existing and proposed protocols already require "sustainable long-term harvest practices" (certification, renewable long- term management plan, etc.) be maintained on all land holdings controlled by a Forest Owner, concern over potential for ecologically irresponsible management outside a project's bounds should be adequately addressed without the introduction of further regulatory hurdles and complexity. *(BLUESOURCE-1)*

Comment: In chapter 5.2.1(d)(1), establishing MBL for IFM projects, the modified method for establishing minimum baseline level (MBL) for IFM projects with initial carbon stocking (ICS) above Common Practice (CP) contradicts the purpose of the program.

Proposed Solution: Retain the previous Protocol's method of establishing MBL for IFM projects with ICS above CP (equation 6.5 of the current Protocol) in place of equation 5.5. *(BLUESOURCE-1)*

Comment: The new method for determining minimum baseline level (MBL) for IFM projects with initial carbon stocking (ICS) above common practice (CP) will run counter to the program's climate goals. If a landowner is forced to use an MBL above CP, due to lower stocking levels on other holdings in the same assessment area, a carbon project may not be feasible. This approach disincentivizes landowners from establishing forest projects on their most highly stocked (and likely to be harvested) acres and thereby forgoes the meaningful climate benefits that would have been associated with preventing aggressive harvesting on these acres for the next 100+ years.

In addition, this rule change will be impractical for implementation and extremely difficult to verify. At the center of the problem is the concept of the logical management unit (LMU), which defines the bounds of the geographic region over which a landowner must consider stocking levels on their other holdings outside the Project Area. Unfortunately, the method prescribed for determining the LMU requires extensive additional data collection on the part of the landowner (which will often be cost prohibitive) and necessitates a surfeit of subjective judgments. Once the LMU is established, the process of verifying the bounds, stocking, and management on the LMU will cause the cost and time involved in project verification to balloon, and may make verification practically impossible. Indeed, in cases where the LMU extends over an acreage many times the scale of the project area itself, the cost and difficulty of verification will likely compel landowners to abandon any consideration of participating in the program.

Proposed Solution:

The previous Protocol's method of establishing MBL for IFM projects with ICS above CP (equation 6.5 of the current Protocol) should be maintained and incorporated into the revised Protocol in place of equation 5.5. As both the existing and proposed protocols already require "sustainable long-term harvest practices" (certification, renewable long-term management plan, etc.) be maintained on all land holdings controlled by a Forest Owner, concern over potential for ecologically irresponsible management outside a project's bounds should be adequately addressed without the introduction of further regulatory hurdles and complexity. *(CAR-1)*

Comment: Method for establishing minimum baseline level (MBL) for IFM projects with initial carbon stocking above Common Practice (Protocol section 5.2.1(d)(1)) – L&C Carbon does not support the new method proposed for establishing a minimum baseline level (MBL) for IFM projects with initial carbon stocking (ICS) above Common Practice.

This proposed change will disincentivize forestland owners from enrolling their highest stock stands into a carbon project. These stands are the most vulnerable to near-term harvest and a significant amount of stored carbon will be lost as a result.

L&C Carbon recommends ARB maintain the current Protocol method for establishing a minimum baseline level (MBL) for IFM projects with initial carbon stocking (ICS) above Common Practice. *(LCCARBON-1)*

Comment: While we generally support the proposed Regulatory Review Update, we are concerned with…

…2. Modified method for establishing Minimum Baseline Levels ("MBL") for IFM projects with Initial Carbons Stocking above Common Practice.

The proposed new method for determining MBL for IFM projects with initial carbon stocking above Common Practice will make many contemplated carbon projects unfeasible. Landowners will be reluctant to develop forest carbon projects on their most highly stocked acreage and will thereby forego the meaningful climate benefits which would result from preventing aggressive harvesting on these tracts. *(TFG-1)*

Comment: The proposed update for Section 5.2.1(d)(1) includes a new equation for determining the Minimum Baseline Level (MBL) where Initial Carbon Stocks are above Common Practice (CP). In the previously adopted Protocol (20 October 2011), the MBL was set to equal CP when ICS is above CP.

ESI understands that the intent of the proposed updated Equation 5.5 (formerly Equation 6.5 in the adopted Protocol) is to ensure conservativeness of the baseline scenario. As such, ESI takes no issue with the equation update, though it is likely

that this will limit the number of forestry offset projects that are actually financially feasible for development by OPOs. ESI speculates this phenomenon would be caused by a smaller upfront "flush" of credits awarded during the initial verification, as well as increased verification costs.

OPOs may be motivated for the adopted Equation 6.5 to be incorporated into the revised Protocol as the updated Equation 5.5 may lower the market share of IFM project type ARBOCs. ESI does not specifically endorse one equation over the other, but ESI always pushes for rules resulting in accurate and real carbon offsets, without over-regulating projects out of the market. We herein ask ARB to consider whether the revision to the equation will result in "over-conservativeness," or if it will truly result in a more accurate and real baseline scenario. ESI wishes to offer important comments on the definition of the LMU should ARB decide to move forward with the proposed updated Equation 5.5. These are outlined below:

- Section 5.2.1(d)(3)(1) requires the OPO to "Identify the LMU according to the definition in subchapter 1.2"

- Section 1.2(a)(28) states "Logical Management Unit" or "LMU" means all landholdings or any subset of landholdings managed explicitly as a defined planning unit that the forest owner(s) and its affiliate(s) either own in fee or hold timber rights on, in which the landholdings or subunit of landholdings are within the same assessment area(s) where the project is located."

    - It is commonly known that Assessment Areas are not spatially explicit, but rather based on forest ecosystems or communities (groups of species).

    - Moreover, properties themselves, or strata/stands within a given property are planning/management units, i.e., Forest Owners do not manage all properties, or even all strata/stands within a given tract, the same.

        - An explicit LMU is challenging to define because such a management area does not exist in the real world.

    - As such, how will a LMU be adequately defined by an OPO and verified by an OVB?

        - ESI suggests limiting the definition of LMU to the definition identified in Section 5.2.1(d)(3)(2), i.e., "all lands where the forest owner(s) and its affiliate(s) either own in fee or hold timber rights within the same assessment area(s) covered by the project area," with the exception of changing "assessment

area(s)" to "Supersections," as these are spatially explicit and efficiently verifiable.

o Should ARB decide that the definition in Section 1.2(a)(28) must be included, ESI is requesting ARB develop step-by-step procedures for determining and verifying the LMU.

• Section 1.2(a)(28) also states "Where even aged management is utilized, an LMU must have a uniform distribution (by area) of 10-year age classes that extend to the normal rotation age (variation of any 10-year age class not to exceed 20%)."

o ESI understands the intent of this requirement is to ensure that all properties owned by the Forest Owner and its affiliates are being sustainably managed. However, we feel that this requirement is sufficiently addressed by the Sustainable Forest Management criteria and, thus, should be omitted from the definition.

o Should ARB decide that this component of the definition must be included, ESI is requesting ARB develop step-by-step procedures for demonstration of this criterion by the OPO and verification by the OVB.

• Section 1.2(a)(28) also states "or; where uneven aged management is utilized, an LMU must have between 33% and 66% of the forested stands exceeding the retention standards identified in the growth and harvest projections by a minimum of 25% (basal area)."

o Given that any future with-project modeling would only be the Forest Owner's best estimate of planned activity, this requirement is unclear.

o Additionally, not all properties owned by a Forest Owner and its affiliates are expected to be managed in the same manner. Some properties may undergo uneven-aged management, while some may undergo even-aged management.

o It is unclear if this requirement is related to the project area itself or the LMU (i.e., the growth and harvest projections).

☐ Section 1.2(a)(28) also states "Timber volumes harvested or scheduled to be harvested must be conducted through modeling growth and yield with an approved growth and yield model or conducted through a stand table projection that indicates sustainable harvest levels."

• This will entail significant additional project development and verification costs, rendering a fewer amount of truly additional projects feasible for development.

• Additionally, why would an OPO go through the process of creating a projection for a hypothetical area that will never be managed according to the model (again forest management activities are not planned or implemented at the scale of an LMU)?

o Given the ambiguities around this requirement, and the fact that this appears to be sufficiently addressed by the Sustainable Forest Management criteria (which clearly mitigates leakage), ARB should consider omitting this component from the definition.

o Should ARB decide that this component of the definition must be included, ESI is requesting ARB develop step-by-step procedures for demonstration of this criterion by the OPO and verification by the OVB.

• Section 1.2(a)(28) also states “In the absence of a management plan that indicates harvest volumes, the standing inventory of the LMU must be within 20% of the landholdings owned by the forest owner(s) and its affiliate(s) within the assessment area.”

o A management plan is not likely going to exist for an LMU, as these are specific to tracts or strata/stands, so it is unclear how this is to be adequately verified. Again, given the fact that this appears to be sufficiently addressed by the Sustainable Forest Management criteria (which clearly mitigates leakage); ARB should consider omitting this component from the definition.

o Should ARB decide that this component of the definition must be included, ESI is requesting ARB develop step-by-step procedures for demonstration of this criterion by the OPO and verification by the OVB. *(FCGHG-1)*

Comment: The proposed change in Section 5.2.1(d)(1) and 5.2.1(d)(3) Equation 5.5. Determining the Minimum Baseline Level Where Initial Carbon Stocks Are Above Common Practice MBL = MAX(CP, MIN(ICS, CP + ICS - WCS)) requires that projects with an initial carbon stocking (ICS) above common practice now must assess stocking levels on properties held by the landowner outside the project area, but within the same logical management unit (LMU). It is unclear the purpose of this change other than to add cost and time to an already expensive process. Costs will increase due to: additional inventory in the LMU, verification of additional inventory in the LMU, time and expense in assessing the viability of a project because both projects and LMU will need to be mapped out and assessed. The process will now

be biased against lands with high carbon stockings, which often are the most vulnerable to future lowering of carbon stocks.

Suggestion: Keep the same definition of Minimum Baseline Level as is found in the current compliance offset protocol. *(WEYCOMP-1)*

Comment: RCE broadly support ARB's proposed Regulatory Updates. However, RCE would like to comment on the following item: Modified methods for establishing minimum baseline level (MBL) for Improved Forest Management (IFM) projects with initial carbon stocking (ICS) above Common Practice (CP) (Protocol Chapter 5.2.1(d)(1))

The new method for determining minimum baseline level (MBL) for IFM projects with initial carbon stocking (ICS) above common practice (CP) greatly increases the effort required on the part of verification bodies to confirm the MBL for such projects. To date, these projects represent the majority of projects verified under the protocol. The increased verification effort stems from the need to confirm age class distribution, carbon stocking levels and basal area retention standards on a forest owners landholdings outside of the project boundary. Furthermore, unlike the guidance provided in Chapter 8 of the protocol for verifying inventories within the project area, no guidance is provided on acceptable methods of verifying these items outside of the project area - possibly leading to a disparity in effort applied across verification bodies to review these items. Verifying these items on lands outside of the project boundary increases the scope of verification, in some cases significantly.

RCE proposes that the previous Protocol's method of establishing MBL for IFM projects with ICS above CP (equation 6.5 of the current Protocol) should be maintained and incorporated into the revised Protocol in place of equation 5.5. As both the existing and proposed protocols already require "sustainable long-term harvest practices" (certification, renewable long-term management plan, etc.) be maintained on all land holdings controlled by a Forest Owner, concern over potential unsustainable harvests occurring outside a project's bounds should be adequately addressed without the introduction of further complexity in determining a project's baseline. *(RCE-1)*

Comment: The modified method for establishing minimum baseline level (MBL) for Improved Forest Management (IFM) projects with initial carbon stocking (ICS) above CP: Projects with ISC above CP are now required to include stocking levels on properties held by the Forest Owner outside the project area, but within the project's Logical Management Unit (LMU).

Background

- The current ARB FOP dated October, 2011 allows a landowner to select their most highly stocked land to participate in an IFM project. The proposed change eliminates this ability.

Implications

- The new method for establishing MBL in the proposed Protocol could lead to increased GHG emissions compared to the existing Protocol's method of establishing MBL for projects with ICS above Common Practice. Consider the following example to elucidate this point. A landowner has 7,000 acres with 3,000 acres above Common Practice. Under the existing protocol, there is enough of an incentive for a landowner to enroll the 3,000 acres with ICS above Common Practice and maintaining or increasing carbon stocks over 100+ years. However, under the new proposed method for defining MBL, the same landowner must include all 7,000 acres in the Project Area. Unfortunately, the weighted average above live carbon stocks (WCS) of the 7,000 acres falls below the Common Practice and the project is no longer a financially viable ARB offset project. Thus, instead of enrolling the 3,000 acres in ARB's offset program and securing the existing carbon stocks of the 3,000 acres for 100+ years and mitigating climate change, the landowner is disinclined to participate in ARB's program. As a result of not participating in ARB's program, the economic conditions of the landowner could dictate him/her to liquidate the timber if needed on the 3,000 acres, incurring net GHG emissions.

Proposed Solutions

- The existing method of establishing CP is adequate for IFM projects. The current default leakage deductions sufficiently and conservatively account for harvest shifting. Additional restrictions are unwarranted. (SIGLLC-1)

Comment: Participants selecting higher-stocked areas for projects should not be penalized. New Equation 5.5 (formerly Equation 6.5) would unduly penalize projects that select higher stocked stands within a broader matrix of a forest ownership for a carbon project. This policy is contrary to current climate science, which highlights the importance of near-term mitigation of greenhouse gas emissions, and this policy would also make it much more difficult to enroll high conservation value forests in the offset protocol.

The Climate Action Reserve Early Action Protocol eventually incorporated equations 6.5 and 6.6, which affected the Minimum Baseline Level for projects which contained stocks that diverged by more than 20% from the average stocks within the same Logical Management Unit of a forest ownership. The rationale was to guard against 'cherry picking' of stands that didn't reflect average stocking within a timberland

ownership and therefore could generate significantly greater offset credit issuance on project registration or significantly more offset credit issuance from annual growth over time.

The ARB made a sound policy decision in altering Equation 6.5 in the protocol adopted in 2011. By allowing the Minimum Baseline Level to equal Common Practice for projects with initial carbon stocks above Common Practice, the ARB enabled offset projects that protected high conservation value forests and that prioritized avoidance of near-term greenhouse gas emissions. Obviously, well-stocked, older-growth forests and stands are significantly more likely to be harvested than lower-stocked, younger-growth forests and stands and therefore are far more likely to generate near-term greenhouse gas emissions associated with timber harvest. The new IPCC Assessment Report 5 very clearly emphasizes the critical importance of near-term (2015-2030) greenhouse gas emissions reductions to maintain a hope of an emissions trajectory that avoids climate catastrophe. Allowing the MBL to equal Common Practice for projects with initial carbon stocks above aligns the protocol with current climate science to prioritize avoiding near-term greenhouse gas emissions. The proposed change in Equation 5.5 is contrary to current climate science.

Furthermore, deleting the proposed change in Equation 5.5 would support the continued enrollment of high conservation value forests in the protocol. Older-growth forests that have high biological and watershed value are frequently embedded within larger forest ownerships that are managed more intensively. Common examples include riparian bottomland hardwoods within a larger pine plantation, or older-growth redwood stands within a mixed conifer landholding. The protocol can most effectively protect such forests when these forests can be enrolled as separate projects. The change in Equation 5.5 would prevent effective protection of such forests through the offset protocol.

The core policy concern here is activity-shifting leakage. If a landowner protects area X with high carbon stocks and maintains the same amount of wood flow from the property by shifting harvest to other areas, the additionality of the carbon sequestered on project area X is compromised. The protocol addresses this issue through the Sustainable Harvesting Practices criteria, which are structured to ensure sustainable harvest rates throughout the entire timberland ownership and as a constraint on activity-shifting leakage. Equations 5.5 and 5.6 and the entire associated concept of the LMU are additional policy mechanisms to guard against activity-shifting leakage. The additional elaborations of the concept of LMU in the proposed protocol make the entire construct very complicated, unwieldy, and increasingly difficult to verify.

If the core policy concern is activity-shifting leakage, we recommend addressing that issue more directly by simply increasing the leakage deduction for projects. Instead

of a 20% leakage deduction, we recommend a leakage deduction of 40%. This level of leakage deduction finds support in the academic literature.

We therefore recommend striking equation 5.5 from the proposed protocol and restoring the old equation (in which MBL = CP when ICS>CP), but increasing the leakage deduction in such circumstances to 40%. This would strongly support the policy goal of avoiding activity-shifting leakage, while also continuing to enable the enrollment of older-growth and high conservation value forests in the protocol and prioritizing the avoidance of near-term greenhouse gas emissions. *(NFI-1)*

Comment: The modification to the minimum baseline level (MBL) calculation of the for improved forest management (IFM) projects where initial carbon stocks are above common practice is detrimental to the interests of the OPO and the ARB. Using the modified equation for MBL now requires that the weighted carbon stocks (WCS) be calculated for all forest projects, for those that are below common practice and now likewise for those that are above common practice.

The calculation of WCS is complicated and expensive; it requires an inventory of all OPO or affiliate owned forests or a high intensity stratified vegetation-type analysis. These further analyses, in addition to the associated increase in verification intensity, escalate the costs of project development and discourage forest owners from participating in the program. Please consider removing this amendment as the protocol already requires “sustainable and long-term harvest practices” be maintained on all forestland holdings controlled by the Forest Owner. *(ECOP-1)*

Comment: In addition, for reasons outlined in detail in our and 14 other written public comments, this rule change will be impracticable for implementation, highly costly, and extremely difficult to verify. Our proposed solution is to maintain the existing protocols method of establishing minimum base line levels which already requires sustainable long-term harvest practices to be maintained on all land holdings controlled by a forest land owner. *(BLUESOURCE-2)*

Comment: The proposed language requires projects that are above common practice to compare project area carbon stocks to those of either the Logical Management Unit (LMU) or the entire landholding of the American Carbon Registry project owner (within the same assessment area). We believe that this adds unnecessary cost and complication to verification services without adding any beneficial stringency or conservatism to the protocol.

The protocol defines additionality on the basis of whether carbon stock levels within the project area are a result of legal requirements, and also how they compare to regional stocking averages. It is not relevant how a project area compares to its surrounding LMU; forest owners should be applauded for committing their high stocked forest areas to 100+ years of maintaining, monitoring and verifying carbon

stocks. We believe that this proposed language will remove the incentive for large land owners to commit portions of their forest land, resulting in non-participation in the offset program.

Further, requiring verifiers to come to reasonable assurance as to the validity of carbon stock estimates in areas outside of the project area, especially in cases where there is no inventory in place, is difficult, if not impossible. This requirement is likely to lead to significant uncertainty and inaccuracy, as well as higher verification costs.

In summary, we recommend delaying adoption of both of the items highlighted in this letter until a committee of qualified forestry professionals is convened to advise on an informed and technically rigorous resolution to the proposed changes and revised protocol language. It is our experience that such impactful changes to a protocol result in reduced participation of landowners in California's offset program in addition to investment uncertainty in forestry offset projects. Most importantly, we believe that the protocol currently contains sufficient stringencies and safeguards to ensure sustainable and natural forest management. *(ACR-1)*

Comment: Our second area of concern is the modified method for establishing minimum base line levels for IFN projects. The new method proposed unjustifiably penalizes projects established on select highly stocked areas of larger forest ownerships. This runs counter to the program's climate goals as it disincentivizes land owners from pursuing forest projects or their most highly stocked and likely to be harvested acres. *(BLUESOURCE-2)*

> **Response:** ARB staff disagrees with commenters suggesting the new minimum baseline approach should be removed and is not justified. The new minimum baseline approach aids in preventing project operators from only selecting their highest stocked lands for participating in the protocol at the expense of their other forest holdings. However, ARB staff agrees that further revision to the definition of the Logical Management Unit (LMU) would provide additional clarity to project operators and verifiers while still maintaining the integrity of the protocol. ARB staff has provided additional modifications to the definition of a Logical Management Unit in the 15-day changes that expands the options for defining a LMU. Two of the added criteria would allow a LMU based on forestlands that have undergone natural disturbance and/or have high conservation value, significantly limiting the project's LMU and the effort required to monitor and verify the LMU. Additionally, the requirements for uniform distribution of age classes and retention standards were removed due to the difficulty of verification.

C-5. Financial Feasibility

C-5.1. Multiple Comments: The draft update includes the addition of restrictive language which disallows financial feasibility demonstrations where comparisons are made to other properties owned by the project submitter, with exceptions provided in special cases. It is unlikely that a landowner would perform a harvest on their property simply to demonstrate the financial feasibility of harvest. Additionally, landowners within a given region may be subject to varying financial hurdles. For example, landowners with a mill and their own harvesting equipment and staff may have a lower financial threshold for harvest than an absentee landowner who harvests in peak markets. In addition, the current language could be interpreted during verification to suggest that a landowner would have to perform sampling activities on a harvested area on another landowner's property, creating a condition that could be impossible to meet. The Reserve recommends reconsideration of this amendment.

At the same time, this section of the protocol would benefit from increased standardization in terms of identifying what constitutes evidence for performing a financial comparison. The Reserve will be happy to work with the Air Resources Board on this challenge, as well as any other challenge that surfaces with the protocol. (CAR-1)

Comment: The criteria for demonstrating financial feasibility are too narrowly defined. Option 2 in Section 6.2.1.3 of the Protocol provides three key criteria for demonstrating financial feasibility. However, they are currently too narrowly defined.

Section 6.2.1.3(2)(A) regarding slopes should be modified to allow for slopes on the comparison properties to be on slopes any percent higher than the project area, because if similar harvesting occurred in the past 15 years on slopes that are more steep than the project area, it would further support the financial feasibility of the baseline projection.

Section 6.2.1.3(2)(C) regarding comparable species composition, there is often not a wealth of publicly available data on species composition in trees per acre on neighboring properties. However other metrics that reflect species composition such as basal area per acre or forest type classifications should be adequate to demonstrate similarity for the purposes of financial feasibility, as long as the best available information is being utilized. *(NFI-1)*

> **Response:** Commenters identification of sections 6.2.1.3(2)(A) and(C) are incorrect regulatory cites. The format is incorrect. Additionally, chapter 6 is project monitoring and the content of the comment is regarding the selection of appropriate properties for demonstration of financial feasibility. ARB staff assumes the commenter is referring to subchapters 5.2.1(e). in the proposed

15-day modifications. ARB staff disagrees that demonstration of financial feasibility can be performed on land solely owned by the project operator, as it could lead to biased results. However, ARB staff has provided additional clarification and options for demonstrating financial feasibility in the 15-day version of the protocol. Two of the three comparable sites may now be on land owned by forest owner(s); the criteria for evaluating the slope of the project area in relation to the comparable site has been clarified and additional methods for evaluating comparable species composition have been added. Subchapter 5.2.1(e)(2)(B)1. was modified to allow for comparable properties to have higher slopes than the project area, and subchapter 5.2.1(e)(2)(B)3. was also modified to provide more clarity and additional options for comparable species composition, both as the commenter requested.

C-6. Common Practice

C-6.1. Multiple Comments: The proposed new CP values do not accurately reflect forest stocking resultant from truly "common practice" forest management, as the values do not take into account cyclical components of the timber market which contribute to spikes and troughs in wood product demand and forest stocks. The new CP values are based exclusively on FIA data collected over a very brief window of time (~2007-2012) largely in the midst and wake of the Great Recession, when housing starts, and the associated timber demand, were at historic lows. The effect of capturing CP values during this time period constitutes an unrepresentative collection of high stocking levels for assessment areas across the country.

Setting CP values based on forest stocking levels at isolated points in time will lead to less than optimal forest carbon sequestration and reduced climate benefit. This is because when baselines are set artificially high based on periodic market fluctuations, and demand for timber surges, there will be even less incentive for landowners to implement a carbon project and stocks will be harvested instead of locked in for 100+ years. Following such market conditions, many forest carbon projects would not be attractive to landowners again until general stocks had subsided and baseline values were sufficiently lowered to allow for project viability.

Proposed Solution:

In order to better represent truly "common" stocking resultant from business-as-usual forest practices, CP values should be based on average stocking levels over an extended time horizon. Stocking averaged over a time period of up to 25 years (i.e. the same length as a project crediting period) would account for timber market

fluctuations and avoid disincentivizing projects during times when the motivation to harvest is highest.

Once the method for calculating CP values is agreed upon, a set process, including a timetable for the release, public review, and eventual implementation of proposed changes, should be adopted for the regular update of these values. This will avoid unpredictable shifts in baseline levels and market uncertainty. *(BLUESOURCE-1)*

Comment: In the assessment area data file, the proposed new CP values do not accurately reflect long-term (i.e. 100+ year) forest stock levels resulting from "common practice" forest management as it does not take into account cyclical components of the timber market which contribute to spikes and troughs in demand and forest stocks.

Proposed Solution: Base CP values on average stocking levels over a time period of up to 25 years. *(BLUESOURCE-1)*

Comment: The Reserve recognizes the need to periodically update the values used for Common Practice in order to accurately reflect actual conditions. Furthermore, we support further standardization of the process, particularly involving site class allocations, which will have the long-term benefit of improved transparency. We recommend that a notification be circulated at least a year in advance of any future updates, since Common Practice values are critically important to evaluating the financial elements of a prospective project and making investment and development decisions. Additionally, we recommend that the notification of updates to Common Practice be accompanied with clear timelines for how long prospective project developers may continue to use previous Common Practice values. *(CAR-1)*

Comment: The proposed new CP values do not accurately reflect forest stocking resultant from truly "common practice" forest management, as the values do not take into account cyclical components of the timber market which contribute to spikes and troughs in wood product demand and forest stocks. The new CP values are based exclusively on FIA data collected over a very brief window of time (~2007-2012) largely in the midst and wake of the Great Recession, when housing starts, and the associated timber demand, were at historic lows. The effect of capturing CP values during this time period constitutes an unrepresentative collection of high stocking levels for assessment areas across the country.

Setting CP values based on forest stocking levels at isolated points in time will lead to less than optimal forest carbon sequestration and reduced climate benefit. This is because when baselines are set artificially high based on periodic market fluctuations, and demand for timber surges, there will be even less incentive for landowners to implement a carbon project and stocks will be harvested instead of

locked in for 100+ years. Following such market conditions, many forest carbon projects would not be attractive to landowners again until general stocks had subsided and baseline values were sufficiently lowered to allow for project viability.

Proposed Solution:

In order to better represent truly “common” stocking resultant from business-as-usual forest practices, CP values should be based on average stocking levels over an extended time horizon. Stocking averaged over a time period of up to 25 years (i.e. the same length as a project crediting period) would account for timber market fluctuations and avoid disincentivizing projects during times when the motivation to harvest is highest.

Once the method for calculating CP values is agreed upon, a set process, including a timetable for the release, public review, and eventual implementation of proposed changes, should be adopted for the regular update of these values. This will avoid unpredictable shifts in baseline levels and market uncertainty. *(CAR-1)*

Comment: Common Practice Values Update – L&C Carbon does not support proposed changes to update Common Practice (CP) values. These new values do not accurately reflect true CP values, due in large part to the narrow window of years from which the CP values were derived (2007-2012).

We support the comments offered by Blue Source to ARB, including its proposed solution to base CP values over a long time period (at least 25 years) to minimize short-term market distortions. *(LCCARBON-1)*

Comment: While we generally support the proposed Regulatory Review Update, we are concerned with the Common Practice values update for private IFM projects. Proposed new Common Practice values do not accurately reflect forest stocking which results from practical “common practice” forest management because the values fail to account for the cyclical effects of the timber market on wood product demand and forest stocks. *(TFG-1)*

Comment: Our third area of concern relates to the common practice values update which has come up a lot in recent months. It's currently based exclusively on FIA data collected over a very brief window of time, 2006 to 2012, largely in the midst and wake of the recession when housing starts and associated timber demand were at historic lows. The effect of capturing common practice values during this time period constitutes an unrepresentative collection of high stocking levels for assessment areas across the country.

Just real briefly, our proposed solution would be to modify this over an extended time period, such as 25 years, the same length of time as a project crediting period, which takes into account timber market fluctuations and avoids disincentivizing

projects during time when the motivation to harvest is the highest. *(BLUESOURCE-2)*

Comment: The update to common practice values are based upon new data collected in years 2007 to 2012. During these years, the economy went through a serious recession, and the housing industry and markets for wood suffered much worse than the economy in general. This resulted in timber prices that were the worst in the modern history of the timber industry and have still not fully recovered. Consequently, many forest owners deferred ordinary harvest to wait for markets to recover. This created an accumulation of forest inventory that is not common practice but an artifact of exceptionally poor market conditions.

Since these inventory increases were not related to common practice, they should not be used for a common practice baseline. Even short term deferral of harvest is a climate benefit and forest owners should not be penalized for doing so.

Thank you for the opportunity to comment. If you should have additional questions or desire clarification, please do not hesitate to contact me. *(PCTC-1)*

> **Response:** ARB staff disagrees that the new Common Practice values do not accurately reflect true stocking from common practice forest management. The data obtained from the U.S. Forest Inventory and Analysis (FIA) National Program accurately reflects business-as-usual practice on forest land throughout the U.S. in recent years based on physical inventories of plots throughout the U.S., and therefore, reflects true common practice.
>
> Resolution 11-32 directs ARB staff to periodically review and update compliance offset protocols. The proposed Common Practice values represent the most recent carbon stock data from FIA. The data was collected using the most recent scientific methods and is more comprehensive than the data set used to establish the existing Common Practice values. This is the first time ARB staff is proposing to change the Common Practice values from the original protocol first considered by the Board in December 2010.
>
> Commenters state the data set used to calculate the proposed Common Practice values is unrepresentative of long-term forest timber demands because it includes the period of time spanning the recession. During this time, single home family starts dropped dramatically and there was a low demand for forest timber. The existing Common Practice values span the general timeframe of 2001 to 2006. This includes the years of 2004 and 2005, which were an unprecedented period of high single-family housing starts and forest timber demand.

Based on publically available documents from The Department of Agriculture, domestic timber demand is generally on the decline. The transition to electronic from paper media, increased imports of furniture, and decreased demand for paperboard products all represent long-term structural changes in the wood sector economy. Furthermore, a review of historical single-family home starts for 2007-2012, the same time period as covered by the proposed Common Practice values, shows that single-family home starts for this time period are similar to long-term average single-family home starts over longer time periods spanning back to 1960. The FIA updates its forest inventory on a rolling basis of 5, 7, or 10 years, so that the majority of recent data for the Common Practice values comes from the 2007-2012 timeframe. This suggests the proposed Common Practice values are more representative of long-term trends in timber demand and the current Common Practice values are representative of an anomalous period of high and unsustainable growth in the home construction sector.

Stakeholders have requested a predictable schedule for future Common Practice updates and additional data leading to the Common Practice updated values. ARB staff agrees with the need to provide a predictable schedule, and will determine a reasonable timeline for future Common Practice updates after consultations with the FIA Program and with stakeholders. For this rulemaking, ARB staff first identified their intent to update Common Practice values at a June 2014 workshop and released the proposed new Common Practice values in July 2014, both more than a year in advance of the new protocol effective date. The release of the proposed new Common Practice values was followed by a webinar explaining their development in October of 2014. ARB staff provided sufficient notice of the changes, details of how the changes were developed and numerous opportunities to comment on the changes prior to adoption.

C-6.2. Comment: First, the updates to the common practice values are, in our view, technically accurate and related to forest service science. And we urge adoption without further delay. *(NFI-2)*

Response: ARB thanks the commenter for their support.

C-7. Alaska-Support

C-7.1. Multiple Comments: The Reserve supports the expanded protocol eligibility to those parts of Alaska that have the necessary FIA data to create the 'Common Practice' estimate used for Improved Forest Management baselines. This is an important progression of the protocol which enables Alaskan landowners to factor

the value of California's carbon market into their management decision- making. *(CAR-1)*

Comment: L&C Carbon supports ARB's proposal to expand eligible project locations to include parts of Alaska. Including Alaska as an eligible project location provides significant opportunities to Alaska native corporations and village corporations to protect historic, environmentally important, and culturally significant forestlands while generating needed income from carbon offset sales to support its people and communities across south central and southeastern Alaska. *(LCCARBON-1)*

Comment: On behalf of the Chugach Alaska Corporation, this is to express our strong support for updates to the U.S. Forest Compliance Offset Protocol to include project eligibility in parts of Alaska. This important action will allow Alaska Native Corporations, their shareholders and other eligible landowners to participate in the carbon market by developing compliance forest offset projects.

Including project eligibility in Alaska will give Chugach and other landowners an alternative to timber harvest and will reward sustainable forest management and protect important old growth forests. Allowing Alaska forest projects into California's carbon market will contribute to the success of the offset program. Alaska forest carbon offset projects could generate millions of compliance offsets, while achieving social, environmental, and economic benefit to Alaska native and resident populations.

The two largest forests in the National Forest system are located in Alaska. The Tongass National Forest in Southeast Alaska encompasses nearly 17 million acres and the Chugach National Forest in Southcentral Alaska more than 5 million acres. Adjacent to, or within the boundaries of these two large national forests, there exists nearly 1.5 million acres of private lands. According to the USDA's Forestry Sciences Lab, the baseline inventory for these southern Alaska forests average between 22 to 30 tons of carbon captured per acre.

When the ARB originally adopted the forest protocol, forest projects in Alaska were made ineligible "due to lack of region-specific data". Region-specific data for the Southcentral and Southeast portions of Alaska is now available, and the proposed update will allow project eligibility in those regions of Alaska.

Thank you for taking action to include project eligibility in parts of Alaska and allow Alaska landowners to participate in California's carbon market. *(CACORP-1)*

Comment: We appreciate in particular the stakeholder process the ARB has engaged in, and believe many of the proposed changes, such as the addition of Alaska, to be very well done. *(BFFP-1)*

Comment: We note that the proposal to expand the geographic scope of the Protocol to Alaska has been thoroughly considered, and is well addressed in the Initial Statement of Reasons. It appears that ARB could take action on that discrete item separately, and sooner than the rest of the Protocol changes. We would encourage that action, to provide pending offset projects in Alaska with the certainty to move forward. *(PFT-1)*

Comment: So I wanted to just address the Board and ask you to consider removing the exclusion of Alaska so we can participate in the forest offset carbon market. So I'm a little bit nervous. Chugach Alaska Corporation was one of the twelve regional organizations formed in the Alaskan Native Claims Settlement Act. And we have 2500 shareholders that are tribal members that were formed in a different way than the reservations of the lower 48. So part of what we received in the Settlement Act was approximately a million acres of surface and sub-surface state that encompasses the land within the Chugach National Forest. And so we have a significant amount of resources that would be eligible to participate in your carbon market. And we're very excited about the opportunity to consider those things.

The two largest forests are the Tongass National Forest of southeast Alaska and the Chugach National Forest. And removing the Alaska exclusion will give Chugach and other Alaska native corporations an alternative to timber harvest and will reward sustainable forest manager. Alaska carbon offset projects could generates million of compliance offsets while achieving social, environmental, and economic benefits to our Alaska native populations. And as you may know that the data was not available when the program first started, and now it is.

So hopefully we will be able to ask you to consider this and that we would be able to participate. So thank you very much. *(CAC-1)*

Comment: In regards to the proposed amendments to the forest protocol, there number of clarifications and changes that the Nature Conservancy supports, including adjustment to common practice values and the inclusion of Alaska. *(TNC-2)*

Comment: First of all, I'd like to say I'm fully supportive of including Alaska. I've done a substantial amount of work in Alaska. I've worked for the Sea Alaska Corporations and believe this provides a great deal of opportunity for forest land owners in Alaska, especially the native and village corporations. *(GDRC-2)*

Response: ARB thanks the above commenters for their support.

C-8. Public Lands

C-8.1. Comment: In Chapter 1.1 of the protocol, the current public lands definition is too broad. AC and IFM baseline requirements for public lands fail to take into account wide variation in management options open to independent agencies or authorities (under increasing pressure to generate new revenue streams from forestland), and establish baselines in a way that makes additional and environmentally valuable projects infeasible.

Proposed resolution: Restrict definition of Public Lands such that independent agencies or authorities (that control budgetary decision-making and are authorized to set harvest levels or sell property, e.g. some water authorities) are categorized as private. This is justified because they face the same pressures and have the same management options as private owners.

For any truly public agency, IFM baselines should be set based on common practice carbon stocks on other public forests in the assessment area based on FIA data (i.e. same approach taken for IFM projects). *(BLUESOURCE-1)*

C-8.2. Comment: In Chapter 1.1, Definitions, The current public lands definition is too broad. AC and IFM baseline requirements for public lands fail to take into account wide variation in management options open to independent agencies or authorities (under increasing pressure to generate new revenue streams from forestland), and establish baselines in a way that makes additional and environmentally valuable projects infeasible.

Proposed Solution: Restrict definition of Public Lands such that independent agencies or authorities (that control budgetary decision-making and are authorized to set harvest levels or sell property, e.g. some water authorities) are categorized as private. This is justified because they face the same pressures and have the same management options as private owners.

For any truly public agency, IFM baselines should be set based on common practice carbon stocks on other public forests in the assessment area based on FIA data (i.e. same approach taken for IFM projects). *(CAR-1)*

> **Response:** ARB staff agrees that the public lands baseline, as presented in the original protocol, was difficult to implement. ARB staff made modifications via 15-day changes to the protocol as a result of stakeholder comments to clarify and allow predictive modeling to aid in baseline development, thereby making the process more streamlined and feasible for public agencies to participate in the program.

C-9. Forest Owner and 100-Year Permanence Requirements

C-9.1. Multiple Comments: In Chapter 3.5.1, Project Life and Minimum Time Commitment, the requirement that a new owner of any part of the Project must agree to take over the Forest Project responsibilities and commitments, unfairly restricts the ability of a landowner to sell any or all of the land included in a Project for at least 100 years, limiting the number of projects that participate in the program.

Proposed Solution: Forest Owners should be allowed to sell or otherwise transfer a portion of the Project Area from the Project, without obligating the new owner to the 100 year commitment (or what remains of it) provided that the OPO or APD undertakes an additional verification prior to the sale to (i) update the Project baseline (ii) confirm the amount of ARBOCs attributable to the portion of the Project Area being withdrawn and (ii) if the number of ARBOCs exceed a materiality threshold (5%), the OPO or APD would then be required to retire a sufficient number of ARBOCs to account for those attributable to the divested property. *(BLUESOURCE-1)*

Comment: Chapter 3.5.1 of the Protocol requires that unless a new owner of any part of the Project agrees to take over the Forest Project responsibilities and commitments, the Project is terminated and offsets must be retired in an amount equal to or in excess of those issued. This unnecessary requirement restricts the ability of a landowner to sell any or all of the land included in a Project for at least 100 years, and is already limiting the number of projects that participate in the program.

<u>Proposed Solution:</u>

Forest Owners should be allowed to sell or otherwise transfer a portion of the Project Area from the Project, without obligating the new owner to the 100 year commitment (or what remains of it) provided that the OPO or APD undertakes an additional verification prior to the sale to (i) update the Project baseline (ii) confirm the amount of ARBOCs attributable to the portion of the Project Area being withdrawn and (iii) if the number of ARBOCs exceed a materiality threshold (5%), the OPO or APD would then be required to retire a sufficient number of ARBOCs to account for those attributable to the divested property. *(BLUESOURCE-1)*

Comment: The current definition, found in Section 95802(a)(109) of the Cap and Trade Regulation, is ambiguous and leads to differing interpretations by ARB, Project Proponents, and verifiers. For example, the current definition can arguably include multiple holders of easements over the property even if they have no control over the Project or reversals. The definition should be modified to ensure consistency in its application.

Proposed Solution

The definition of Forest Owner within the Protocol and the Regulations should be modified to include only those entities that have an interest in the real property and have current control over or management of the Project Area. If a new party takes over control of the Project in the future, they may be considered a Forest Owner at that time but not before. The OPO would also be the party liable for compliance with the Protocol and the Regulations, thereby releasing other potential Forest Owners from liability for reversal or non-compliance with the Protocol. *(CAR-1)*

Comment: Chapter 3.5.1 of the Protocol requires that unless a new owner of any part of the Project agrees to take over the Forest Project responsibilities and commitments, the Project is terminated and offsets must be retired in an amount equal to or in excess of those issued. This unnecessary requirement restricts the ability of a landowner to sell any or all of the land included in a Project for at least 100 years, and is already limiting the number of projects that participate in the program.

Proposed Solution:

Forest Owners should be allowed to sell or otherwise transfer a portion of the Project Area from the Project, without obligating the new owner to the 100 year commitment (or what remains of it) provided that the OPO or APD undertakes an additional verification prior to the sale to (i) update the Project baseline (ii) confirm the amount of ARBOCs attributable to the portion of the Project Area being withdrawn and (iii) if the number of ARBOCs exceed a materiality threshold (5%), the OPO or APD would then be required to retire a sufficient number of ARBOCs to account for those attributable to the divested property. *(CAR-1)*

Comment: The current definition, found in Section 95802(a)(109) of the Cap and Trade Regulation, is ambiguous and leads to differing interpretations by ARB, Project Proponents, and verifiers. For example, the current definition can arguably include multiple holders of easements over the property even if they have no control over the Project or reversals. The definition should be modified to ensure consistency in its application.

Proposed Solution: The definition of Forest Owner within the Protocol and the Regulations should be modified to include only those entities that have an interest in the real property and have current control over or management of the Project Area. If a new party takes over control of the Project in the future, they may be considered a Forest Owner at that time but not before. The OPO would also be the party liable for compliance with the Protocol and the Regulations, thereby releasing other potential Forest Owners from liability for reversal or non-compliance with the Protocol.

Section 2.2 (former) of the protocol, “Forest Owners,” also states that the definition of Forest Owner needs clarity as it can lead to differing interpretations by Forest Owners, OPOs, ARB and verifiers. We propose to add language to the protocol clarifying that a forest owner is one with an interest in the real property within the project area and has current control over the Project. *(BLUESOURCE-1)*

Comment: In former Section 2.2 (and in §95802, Definitions (153) of the Regulation), Forest Owners, the definition of forest owner needs clarity as it can lead to differing interpretations by Forest Owners, OPOs, ARB and verifiers.

Proposed Solution: Add language to the protocol clarifying that a forest owner is one with an interest in the real property within the project area and has current control over the Project. *(CAR-1)*

Comment: In addition to the concerns outline above, as I relayed in a meeting to ARB staff last December, we remain concerned with the current definition of a “Forest Owner” and an Offset Project Operator. We strongly believe that these definitions should be modified to reflect the reality with respect to forest ownership over the long term. We typically own our forests for a period of 10 to 15 years, during which time we may develop a carbon project. At the end of this investment period, we typically sell the property, and it may often be sold in several parcels to different buyers. If the selling TIMO has placed a carbon project on the property, it is appropriate for buyers to assume their respective obligations with respect to the project. They should not be expected, however, to become jointly and severally liable for the failure of an unrelated party to comply with the Protocol in the future. *(TFG-1)*

Chapter 3.5.1 of the Protocol also requires that a new owner of timberlands must agree to take over the forest project responsibilities and commitments or the project will be terminated and offsets must be retired in an amount equal to or in excess of those which have been issued. This requirement restricts the ability of a timberland owner to sell land which is included in the project for at least 100 years. This has the practical effect of greatly eliminating the number of forest projects which are considered. We believe that forest owners should be allowed to sell or transfer a portion of a forest project free and clear of the forest project responsibilities and commitments provided that the OPO or APD has undertaken additional verification prior to the sale which updates the project baseline, confirms the amount of ARBOCs attributable to the portion of the project which is being sold and withdrawn, and, if the number of ARBOCs exceed a materiality threshold, then the OPO or APD would be required to retire a sufficient number of ARBOCs to account for those attributable to the conveyed property. *(TFG-1)*

Comment: The following shares several proposed improvements to the forestry protocol and language in the Regulation, in order to improve the program’s

workability and landowner participation while fully maintaining the integrity and permanence of credited greenhouse gas emissions reductions. The current "Forest Owner" definition, found in Section 95802(a)(109) of the Regulation is ambiguous and leads to differing interpretations by ARB, Project Proponents, and verifiers, thereby leading to inconsistency in its application. We recommend the definition of "Forest Owner" within the Protocol (and the Regulation) be modified to include only those entities that have an interest in the real property and have current control over or management of the Project Area. *(IETA-1)*

Comment: Chapter 3.5.1 of ARB's Forest Protocol requires that unless a new owner (of any part) of the Project agrees to take over the Forest Project responsibilities and commitments, the Project is terminated and offsets must be retired in an amount equal to, or in excess of, those issued. This requirement, which is already limiting the number of projects participating in California's program, is unnecessary and restricts the ability of a landowner to sell any or all of the land included in a Project for at least 100 years. We believe that Forest Owners should be allowed to sell, or otherwise transfer, a portion of the Project Area from the Project, without obligating the new owner to the 100 year commitment (or what remains of it) provided that the OPO or APD undertakes an additional verification prior to the sale. *(IETA-1)*

Comment: Please define "forest ownership" as used in section 3.1.b.1.C.

Additionally in section 3.1.b.1.C, please include a new set of qualifications for ownerships less than 200 acres, as the current qualifications preclude these small ownerships from practicing forest management. For example, a 200 acre forest ownership harvesting 40 acres would likely fall below 20% less than the carbon stocks at project initiation while a 1,000 acre forest ownership harvesting 40 acres would likely be unaffected. As written, the current qualifications in this section unfairly penalize small landowners with fewer than 200 acres. *(ECOP-1)*

Comment: Ability to amend project acreage. The ability to add or subtract acreage from a project area is technically complex under the protocol design but very important to tackle. While not addressed in this protocol update, we recommend that ARB consider in the future convening a working group to discuss methods to accomplish the addition or subtraction of acreage from a project. Timberland ownership is in constant flux and the protocol will gain wider adoption and greater longevity if it can accommodate the addition and subtraction of acreage from project areas. *(NFI-1)*

Comment: In addition to these comments specific to the proposed protocol changes, we also recommend ARB explore the ability for a registered IFM project to be geographically subdivided. Since all carbon accounting is spatially explicit this is possible without compromising the integrity of the GHG emission reductions

or enhancements. We feel the ability to split existing projects will increase participation of landowners in the program because it provides transaction flexibility in future title conveyances of the project area. *(FCC-1)*

Response: Both the definition of Forest Owner and the 100-year permanence requirement remain unchanged from the Forest Protocol adopted by the Board in 2011. ARB staff is assuming the incorrect reference to section 95802(a)(109) by several commenters is in reference to the definition of "Forest Owner" as implied by the comment. References to the Forest Owner definition in the Regulation are outside the scope of this rulemaking because no changes have been proposed to the definition. There are too many forest holders and carbon pools and sources involved in forest offset projects for ARB to make a determination of who is liable for activities that are undertaken on forest land. Such liability issues must be worked out among the parties through third-party contractual agreements. ARB must ensure the enforceability of the regulation, and ARB staff believes the current definition of Forest Owner allows ARB to enforce against parties that are responsible for reversals and invalidations.

ARB staff disagrees with comments suggesting that parts of projects should be able to be removed from the project as long as the project operator accurately accounts for all carbon. Forest owners voluntarily commit to a forest project with full knowledge of the 100-year time commitment and are expected to meet all project requirements. Maintaining the same project acreage for the lifetime of the project is essential to maintaining permanence of the GHG emission reduction and GHG removal enhancements, which is one of the requirements of Section 38562(d)(1) of the Health and Safety Code. To remove a project area, would require a substantial effort on behalf of the project operators, verifiers, OPR staff, and ARB staff and risk errors resulting in ARB offsets not being permanent. Since all project participants voluntarily committed to the 100-year time commitment, ARB staff has determined that the risk is too great to allow removal of project area after beginning a crediting period. The project baseline is set at project commencement incorporating the entire project acreage, and cannot be changed or subdivided unless an error has been identified. In the case of an error, the project operator will note the change in the project area in the OPDR. The baseline will only have to be modified if the error is greater than 5.00 percent. If a material misstatement greater than 5.00 percent is determined then excess issued ARB offset credits will be subject to invalidation.

Ensuring permanence is essential to the environmental integrity of the entire Cap-and-Trade Program and required by AB 32 as indicated above. Because

offsets allow for an equivalent quantity of GHG emissions within the capped sectors, the CO_2 stored in biological sinks resulting from offset project activities must stay out of the atmosphere for a time period comparable to the emissions they are offsetting. If they do not, the net effect would be an increase in GHG emissions to the atmosphere. Scientific estimates of the atmospheric lifetime of anthropogenic CO_2 emissions are uncertain, as CO_2 is removed from the atmosphere by a number of processes that operate at different timescales. However, 100 years should be viewed as a minimum time period for maintaining permanence because a fraction of anthropogenic CO_2 is expected to remain in the atmosphere well beyond 100 years as it is gradually removed through processes such as silicate weathering. The period of 100 years is frequently used in international climate change policy as a standard frame of reference for determining global warming potentials and setting GHG emission reduction targets, and consequently, the use of 100 years to define the permanence of GHG reductions is consistent with international policy.

C-10. Project Eligibility/Boundaries

C-10.1. Multiple Comments: In Chapter 2 of the protocol, Eligibility Activities, The current protocol has no methodology for adjusting project boundaries following the initial verification. Forest owners (particularly large ones) periodically have their property boundaries re-surveyed, and this often leads to minor shifts in boundary locations and total acreage.

Proposed Solution: Allow for updates to project boundaries. *(BLUESOURCE-1)*

Comment: In Chapter 2, Eligibility Activities, the current protocol has no methodology for adjusting project boundaries following the initial verification. Forest owners (particularly large ones) periodically have their property boundaries re-surveyed, and this often leads to minor shifts in boundary locations and total acreage. Also, many potential projects span more than 2 Super sections. The limitation to prohibiting a Project from crossing no more than 2 adjacent Super sections is an unfair barrier to entry and does not enhance the overall Program.

Proposed Solution: Allow for updates to project boundaries and allow a Project to cross multiple adjacent super sections. *(CAR-1)*

Comment: In Chapter 2 of the protocol, Eligibility Activities, Many potential projects span more than 2 Super sections. The limitation to prohibiting a Project from crossing no more than 2 adjacent Super sections is an unfair barrier to entry and does not enhance the overall Program.

Proposed Solution: Allow a Project to cross multiple adjacent Super sections. *(BLUESOURCE-1)*

Comment: Project areas should not be limited to two adjacent Supersections. Section 4 of the Protocol allows a project to extend across multiple assessment areas but only two adjacent supersections. There are many parts in the country where three or more supersection boundaries are in close proximity to one another, and a single ownership could span more than two adjacent supersections. Under the current language of the Protocol, such a landowner would be forced to split their property into multiple projects, thereby assuming additional costs with no additional benefit to the climate. Moreover, in parts of the country such as the Northeast land ownership is often fragmented between many small private and family forest owners. Many of these landowners would like to participate in a carbon project if they could collectively group their properties together in aggregation and share in the upfront development and verification costs. Allowing projects to span multiple supersections would allow for greater participation of small landowners in the program and generate additional opportunities for greenhouse gas reductions. *(NFI-1)*

> **Response:** There have been no modifications to the project boundary requirements or the two-supersection limit from the Forest Protocol originally adopted by the Board in 2011. However, ARB staff made modifications to several other sections allowing operators to continue to use the original project baseline as long as an error greater than 5.00 percent did not occur. Therefore, for small changes in project boundaries that result from errors identified in the original boundary, the project operator would be required to identify the updated boundary in the Offset Project Data Report, but would not adjust the baseline if the error was less than 5.00 percent. The baseline cannot be adjusted for the purpose of removing acreage or a Forest Owner from the project.

C-11. Native Species

C-11.1. Comment: Section 3.1(a)(1) of the current proposed Forest Protocol states that a project consists of at least 95% native species based on the sum of carbon in the standing live tree carbon pool.

It is recommended that this language be replaced with "Project consists of at least 95% native species based on the sum of carbon in Standing Live Carbon Stocks" for greater clarity. *(SCS-1)*

> **Response:** ARB staff agrees with the commenter and has modified the language in Table 3.1.

C-11.2. Comment: Section 3.1(a)(1) of the current proposed Forest Protocol states that native species are identified under the heading “Associated Species” in the Assessment Area Data File associated with this protocol version available on the Forest Offset Protocol Resources section of ARB’s website.

It is recommended that ARB personnel confirm, through careful consultation with outside experts, that this is, in fact, the case for all assessment areas within the geographic scope of the draft revision. It has been SCS' experience, in past verification audits, that the species identified within the heading “Associated Species” in the Assessment Area Data File are exemplary of a specific assessment area, but that the list of species under this heading is not necessarily an exhaustive list of species that are native to any given assessment area. As one example of this, many hardwood species (e.g., blue oak, California black oak, California live oak) that naturally occur within the "Coast Redwood/Douglas-fir Mixed Conifer" assessment area of the "Northern California Coast" supersection are not listed within the heading “Associated Species” for that assessment area. *(SCS-1)*

> **Response:** The native species values are unchanged from the original adoption of the Forest Protocol by the Board in 2011. ARB staff acknowledges that a review and check of species composition for each assessment area may be worthwhile, but it was not within the scope of this protocol update process.

C-11.3. Comment: Section 3.1(a)(1) of the current proposed Forest Protocol states that assessed at initial and all subsequent verifications from inventory data.

It is stated in Table 3.1 that the "Native Species" and "Composition of Native Species" criteria are "Assessed at initial and all subsequent verifications from inventory data." However, it is unclear how this assessment can happen prior to the second site-visit verification for reforestation projects, since inventory data may not be available for reforestation projects prior to the second site-visit verification (as allowed by the Protocol). *(SCS-1)*

> **Response:** ARB staff agrees with the stakeholder’s comment and have **made 15-day** modif**ications to** the protocol to allow reforestation projects to defer the assessment to the second site-visit verification.

C-12. Other

C-12.1. Comment: It is the observation of our team, based upon field experience, that certain proposed changes to the Protocol would disproportionately affect forest carbon offset projects located in the Eastern United States, particularly in the

Southeast, significantly limiting the supply of offsets in the cap-and-trade market by discouraging forest owners from undertaking carbon projects. *(GA-1)*

> **Response:** ARB staff have made 15-day modifications to two key sections of the Forest protocol; even-aged management, minimum baseline that should clarify and simplify project implementation. These changes are addressed in more detail in section C-3 and C-4 of this document. This should resolve some of the commenters concern about undertaking carbon projects. The Common Practice values which many commenters have expressed concern over remain unchanged because are based on the best data available for determining business-as-usual. It is important that only carbon stock increases beyond business-as-usual are eligible for ARB offset credits.
>
> Offset projects are responsive to the price of offsets. If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, project developers will respond by undertaking more projects with the expectation of higher returns on investment. An increasing price for offsets may incent projects that were not previously financially feasible.
>
> While offset supply is an important factor, assuring that all ARB offsets represent real, permanent, quantifiable, verifiable, enforceable, and additional GHG emission reductions and GHG removal enhancements is also important. ARB staff has taken several steps to address offset supply concerns. In addition to the four originally approved protocols in 2011, ARB has added a Mine Methane Capture offset Project Protocol, is proposing to add a Rice Cultivation Projects Protocol, and extend the geographic scope of the current Forestry Protocol to include Alaska. ARB staff will continue to evaluate and propose new offset protocols that would generate compliance offset credits that meet AB32 criteria. It is also important to note that there is no indication that all possible projects have been implemented under the existing protocols.

C-12.2. Multiple Comments: In Chapter 2.3 of the protocol, Avoided Conversion, Currently, a retro-active Avoided Conversion project can only claim credits from the time a conservation easement is qualified, which may not be the commencement date, as commencement is signified by the establishment of any conservation easement that runs into perpetuity.

Proposed Solution: Change the language for Avoided Conversion eligibility/crediting period such that the projects can be credited from time of commencement *(BLUESOURCE-1)*

Comment: Currently, a retro-active Avoided Conversion project can only claim credits from the time a conservation easement is qualified, which may not be the

commencement date, as commencement is signified by the establishment of any conservation easement that runs into perpetuity.

Proposed Solution: Change the language for Avoided Conversion eligibility/crediting period such that the projects can be credited from time of commencement. *(CAR-1)*

> **Response:** This section of the protocol remains unchanged from the Forest Protocol adopted by the Board in 2011. Requiring ARB to be a third-party beneficiary to a conservation easement, thus making it a qualified conservation easement (QCE), ensures that the provisions of the easement are enforceable and that ARB would be a party to any potential future modifications to the easement. ARB does not allow the retroactive application of QCEs for any project type, including avoided conversion projects, to ensure the QCE was in effect for the reporting period being issued ARB offset credits.

C-12.3. Comment: In table 3.1 of the protocol, Natural Forest Management, Standing dead requirement of 1 t C/acre or 1%, whichever is higher fails to reflect differences in forest types and age classes.

Proposed Solutions: Eliminate “whichever is higher” to allow %- based approach reflecting forest differences. *(BLUESOURCE-1)*

> **Response:** This section of the protocol remains unchanged from the protocol adopted by the Board in 2011 and has only been reformatted. ARB staff considers the existing provisions necessary to promote natural forest management. Setting a minimum of one metric ton of carbon per acre ensures that lying dead wood is not being removed.

C-12.4. Multiple Comments: In Chapters 5.1.1(d)(1), 5.2.1(h)(1), 5.2.2(e)(1), and 5.3.1(d)(1), the modified language provides a mechanism for correcting mistakes in the baseline which have lead to over-crediting, but includes no provision for correcting mistakes in the baseline that have resulted in under-crediting.

Proposed Solution: The symmetrical language, allowing for the correction of baseline errors that would lead to increased project crediting, should be added to these sections of the protocol. *(BLUESOURCE-1)*

Comment: Sections 5.1.1(d)(1); 5.2.1(h)(1); 5.2.2(e)(1); and 5.3.1(d)(1)

(1) If correctable errors to the baseline are detected in subsequent verifications, the baseline must be adjusted prior to a verification statement being issued. The corrected baseline would then supersede the originally verified baseline for the purpose of determining GHG emission reductions and GHG removal enhancements going forward.

(A) Previously issues ARB offset credits will be subject to the invalidation provisions in section 95985 of the Regulation.

(B) In no case will additional ARB offset credit be issued

There should be consistency in how corrections apply in the case of over-stating the baseline or understating the baseline. Currently the protocol requires invalidation of credits if the baseline had been under-represented but does not reward additional credits if the baseline is found to be over-represented. We believe that the protocol should rightly invalidate credits if a mistake is found in the baseline; and likewise reward additional credits if that baseline had been overstated. There should be consistency in how an error is corrected.

Suggestion: change 5.1.1(d)(1)(B), 5.2.1(h)(1)(B), 5.2.2(a)(1)(B), and 5.3.1(d)(1)(B) to the following:

(A) Any additional ARB offset credits that accrue from correcting the baseline should be issued to the landowner. *(WEYCOMP-1)*

Comment: Sections 5.1.1(d)(1); 5.2.1(h)(1); 5.2.2(e)(1); and 5.3.1(d)(1)

These sections contain the same language:

(1) If correctable errors to the baseline are detected in subsequent verifications, the baseline must be adjusted prior to a verification statement being issued. The corrected baseline would then supersede the originally verified baseline for the purpose of determining GHG emission reductions and GHG removal enhancements going forward.

(A) Previously issues ARB offset credits will be subject to the invalidation provisions in section 95985 of the Regulation.

(B) In no case will additional ARB offset credit be issued

We agree that this language clarifies that mistakes in the baseline which over-credit a project are subject to the invalidation procedures of the Regulation. However, we believe that if a mistake is found in the baseline which results in additional offset credits, that those offset credits should be rightfully issued to the landowner.

We see no reason that the liability for a mistake made in a baseline calculation that goes unnoticed by a developer, landowner, verifier, registry, and ARB continues to exist for up to 8 years following issuance of offset credits, while a potential significant loss to the landowner and available supply that goes unnoticed by a developer, landowner, verifier, registry, and ARB should be lost forever. We believe there

should be congruity in the treatment of calculation errors discovered after initial issuance.

Therefore, we propose that sections 5.1.1(d)(1)(B), 5.2.1(h)(1)(B), 5.2.2(a)(1)(B), and 5.3.1(d)(1)(B) be deleted from the protocol. *(FCC-1)*

> **Response:** Projects that have baseline errors in excess of 5.00% would be required to correct the baseline whether it results in over- or under-crediting. However, the project would not be eligible to receive additional ARB offset credits if the baseline resulted in under-crediting of previous reporting periods. The Forest Protocol only contains the methods for quantifying GHG emission reductions or enhanced sequestration. The Regulation contains the mechanisms for issuing and invalidating ARB offset credits. The Regulation does not have a mechanism for retroactive issuance of ARB offset credits. The only circumstances under which the Regulation allows changes in offset credits issued for a reporting period is through invalidation. Changes to the issuance and invalidation section of the Regulation are outside the scope of this rulemaking.

C-12.5. Comment: In Appendix C: Estimating Carbon in Wood Products, Currently the specific gravities assigned to various species are inconsistent between the Wood Handbook, the Pacific Northwest table in the protocol, and the Component Ratio Method (CRM) excel file.

Proposed Solution: Reconcile the inconsistencies and include in an updated CRM file. *(BLUESOURCE-1)*

> **Response:** There is no Pacific Northwest table in the updated protocol. Previous versions of the protocol included a table for the Pacific Southwest which was not included in this version. As stated in the protocol, wood density factor should be obtained from the U.S. Department of Agriculture, Forest Service article by Patrick Miles and Brad Smith, as referenced in the protocol, if the project is located in the Pacific Northwest and from the USFS Wood Handbook if project is located in other regions.

C-12.6. Comment: In Appendix C: Estimating Carbon in Wood Products, For wood products calculations, the protocol requires that the OPO report the quantity of wood that was harvested, by species, for every reporting period. This is problematic as pulp harvesting operations often combine multiple species into a single product category.

Proposed Solution: When harvesting involves pulp operations that combine multiple species into one product category, allow for the harvest volumes to be aggregated into hardwood or softwood cords with an average specific gravity used in the wood products calculations. *(BLUESOURCE-1)*

Response: This is unchanged from the protocol originally adopted by the Board in 2011. Additionally, average specific gravity values by hardwood and softwood are not available; therefore, this modification is not possible. An average value would depend on the proportion of species sent to pulp and ARB staff is not aware of any available data.

C-12.7. Multiple Comments: Appendix D, Determination of a Forest Project's Reversal Risk Rating, Projects that have risks eliminated by legally binding conservation easements are unfairly penalized by default risk ratings, creating unnecessary barrier to entry.

Note - The use of a non-qualified easement in reducing project reversal risk is supported by the obligation to model all constraints of a non- qualified easement into the project's baseline. If such restrictions are considered legally binding in the baseline, they should also be considered legally applicable to all risk categories that are reduced by the recordation of the easement.

Proposed Solution: If a project has a non-qualified easement that prohibits all harvesting activity, it should not be subject to a buffer contribution requirement for the risk of over-harvesting, as any harvesting at all would already be legally forbidden. *(BLUESOURCE-1)*

Comment: In Appendix D, Determination of a Forest Project's Reversal Risk Rating, Projects that have risks eliminated by legally binding conservation easements are unfairly penalized by default risk ratings, creating unnecessary barrier to entry.

Note - The use of a non-qualified easement in reducing project reversal risk is supported by the obligation to model all constraints of a non- qualified easement into the project's baseline. If such restrictions are considered legally binding in the baseline, they should also be considered legally applicable to all risk categories that are reduced by the recordation of the easement.

Proposed Solution: If a project has a non-qualified easement, it should not be subject to a buffer contribution requirement for financial risk. If a project has a non-qualified easement that prohibits conversion to non-forest uses, it should not be subject to a buffer contribution requirement for the risk of conversion to non- forest uses, as any conversion would be legally prohibited. *(BLUESOURCE-1)*

Response: ARB staff disagrees with the suggestion. Requiring ARB to be a third-party beneficiary to a conservation easement, making it a QCE, ensures that the provisions of the easement are enforceable and that ARB would be a party to any potential future modifications to the easement. Thus, having a QCE further reduces risk by ensuring the easement will be enforced, meriting

the reduced buffer contribution. Non-qualified easements are not enforceable by ARB and, therefore, should not receive the reduced buffer contribution.

C-12.8. Comment: We support the comments offered by Blue Source to ARB, including its proposed solution. Further, L&C Carbon supports Blue Source's suggested improvements to the Protocol and Regulation included in its comments submitted to ARB on December 11, 2014. These suggestions to ARB have not been addressed in the current proposed Regulatory Review Update. If these suggestions were implemented by ARB, landowner participation in the ARB program would significantly increase, in part, due to clarifying program issues and improving the program's workability. *(LCCARBON-1)*

> **Response:** ARB staff has responded to all comments submitted by Blue Source elsewhere in this document. This comment does not contain a specific comment directed at the regulation.

C-12.9. Comment: 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. *(UCB-1)*

> **Response:** This is unchanged from the Forest Protocol originally adopted by the Board in 2011. The references cited by the commenter modeled both a wide range of leakage factors and the effects of an extremely large reduction in harvesting in an area. While these are valid references to consider when setting the leakage factor they are not the only information used to determine the leakage factor. The 20% factor is ARB staff's best estimate of the actual leakage occurring at a single offset project.

C-12.10. Comment: 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. *(UCB-1)*

> **Response:** With the exception of adding mill efficiencies for Alaska, all other mill efficiencies are unchanged from the Forest Protocol originally adopted by the Board in 2011. While the link in the spreadsheet may have been broken, the reference cited in the document (Technical Guidelines for Voluntary Reporting of Greenhouse Gas Program) contains the data used to determine the mill efficiencies and was available from ARB during the comment periods and available upon request.

C-12.11. Comment: On your website, you describe the CAR as "a national offsets program focused on ensuring environmental integrity of GHG emissions reduction projects to create and support financial and environmental value in the U.S. carbon market." As we understand the CAR Forest Project Protocol 3.3, it purports to encourage custodial forest management, or conservation forests, designed to preserve the maximum amount of land in forest. However, from a national perspective, Protocol version 3.3 provides limited opportunities for working forests which are accountable for a financial return to their owners. While we recognize that it may not be prudent for the Protocol to reward forest owners with offsets for common practice commercial forestry, the preference for conservation forests in the Protocol loses the important contribution of sustainably managed forests when considering the ongoing life cycle accumulation of carbon in both onsite and offsite carbon pools. The proposed changes will only exacerbate this consequence. *(NAFO-1)*

> **Response:** ARB had no influence of the design of the CAR Forest Project Protocol 3.3. The protocol has not been recognized by ARB as eligible for early action offset credits and has no bearing on the current rulemaking. ARB's adoption of an updated forestry protocol is not an incorporation of CAR Forest Project Protocol 3.3. The CAR Forest Project Protocol 3.3 is only valid

in the voluntary market and credits issued as a result of this protocol are not eligible to transition to ARB compliance offset credits.

C-12.12. Comment: The Natural Forest Management Criteria gives forest owners the option of choosing to participate in a third party forest certification program under the Sustainable Forestry Initiative, Forest Stewardship Council, or American Tree Farm programs, and these programs have detailed green-up requirements to address aesthetics and wildlife habitat. In addition, many state forest practices acts have specific green-up requirements to environmental integrity. We therefore urge the Board to drop this proposed change as lacking any silvicultural or environmental justification and as contrary to the Board's interest of encouraging nationwide participation in this program. *(NAFO-1)*

Response: Certification under a third party is one of three mechanisms available to Forest Owners to show conformance with the Natural Forest Management Criteria. If a Forest Owner does not wish to certify with one of these programs, there are two other options available to satisfy the requirement in subchapter 3.1(a)(2)(C) of the U.S. Forest Protocol.

C-12.13. Comment: The Existing ARB Offsets U.S. Forest Protocol needs some necessary modifications. For example, the current protocol require projects to be third party verified, by approved verification bodies which in California must also involve a Registered Professional Forester (RPF). The project proponent must utilize the services of a RPF for all calculations as well, yet while with all these required Professionals there is no provision for "de minimis" effects, thus extremely small issues that have no substantive bearing on the resulting offset calculations, yet trigger high costs of re-calculation under the "if it is correctable it must be corrected protocol language." The ABB staff also added this approach without the help of any "Stakeholder Work Group process". This small change without any effect or loss in real, accurate, permanent, and quantifiable offsets could substantially reduce the costs of project proponents and help stabilize and increase the supply of offsets. *(SPI-1)*

Response: The requirement identified by the commenter, "if it is correctable it must be corrected" is found in section 959771.1(b)(3)(M) of the Regulation, which is outside the scope of the proposed regulatory modifications, therefore no response is required. However, the Regulation allows a material misstatement of up to 5.00 percent. The requirement to correct all correctible errors is to prevent a project operator from taking advantage of this 5.00% and intentionally over-reporting GHG emission reductions or enhanced sequestration.

C-12.14. Comment: A few of the other issues that a stakeholder work group could undertake include the currently incorrect treatment of annual harvests vs periodic

harvests that penalize offset generation form projects that produce more harvests than the baseline, where harvest occurs periodically. The overly conservative factors used for mill efficiency, the lack of recognition or carbon neutral biomass energy from residues of improved forest management projects, and the over reach of minor violations of other laws unrelated to carbon sequestration which result in potential invalidation of all offsets for a reporting period should also be addressed.

Developing more efficient methods to support offset project development is especially important as the ARB considers the post-2020 goals of further reductions in CO_2 emissions without drastic economic effects on the California economy.

SPI supports the establishment of a stakeholder work group process to help the ARB develop appropriate and necessary changes to eh Protocol that will reduce the cost and increase the efficiency of bringing more offsets to market, while maintaining the current standards of being accurate, real, quantifiable, and permanent. The ARB needs to clearly identify the mission of such a stakeholder group as a those changes related to carbon emissions and sequestration and not drift into forest regulation. *(SPI-1)*

> **Response:** ARB staff supports the use of stakeholder workgroups; however, during this rulemaking, ARB staff used workshops, a webinar, draft protocols released for informal comments, and individual stakeholder meetings to engage stakeholders. ARB has used stakeholder workgroups in the past and will use them in future modifications to the protocol, as appropriate.

C-12.15. Comment: Please consider a more easily navigable format for the Protocol versus the current format of "Draft Reg Review Update_Forest Protocol102814.pdf." This is similar to the Regulation and will make desk review activities associated with verification more cumbersome, as all current templates, checklists, and internal documents will need to be revised. This will be an extremely costly expense to the verification bodies. Specifically, please consider a format similar to the previous adopted version of the Protocol, with each section and subsection fully numbered and available in the table of contents. *(FCGHG-1)*

> **Response:** The protocols are part of the Cap-and-Trade Regulation, and as such, a stated goal of the proposed revisions was to make the protocols more consistent with regulatory format. The updated Forest Protocol uses a standard regulatory format to individually number each statement, allowing for exact referencing of a particular portion of the protocol. The previous versions of the protocol had multiple paragraphs under a single citation and additional language on protocol development and rationale that was more appropriate for a staff report than a regulatory document. ARB staff understands that changing all internal documents to fit the new protocol is a time consuming and costly endeavor for verification bodies and project

operators; however, the benefits of making the protocol more consistent with regulatory format outweigh theses encumbrances.

C-12.16. Comment: In table 3.1, the species composition requirement is now measured by trees per acre for IFM projects. Please consider maintaining the currently adopted requirement of basal area per acre for this metric, as this represents a better measure of species composition for established forests. *(FCGHG-1)*

Response: ARB staff is unsure what the commenter is referring to there has been no change to the species composition requirement. According to table 3.1, the composition of native species for improved forest management is already measured as the percent of the of the basal area of all live trees in the Project Area as requested by the commenter, and has been this way since the Board adoption of the original Forest Protocol in 2011.

C-12.17. Comment: Regarding Distribution of Age Classes/Sustainable Management, Table 3.1 states "If even-aged management is practiced, on a watershed scale up to 10,000 acres (or the project area, whichever is smaller), projects must maintain no more than 40 percent of their forested acres in ages less than 20 years. (Areas impacted by Significant Disturbance may be excluded from this test.)"

The watershed scale portion of this requirement is ambiguous and has often left the OPO wondering the intent. If the distribution of age class is to be assessed against watershed size, a more precise definition is needed or measurement method. Further, the noted size appears to be arbitrary and insufficient to ensure adequate age classes exist across all landscapes.

Please consider relegating this requirement to the project area itself, or provide more clarity and guidance regarding the "watershed scale up to 10,000 acres" portion of this requirement. *(FCGHG-1)*

Response: This section of the protocol is unchanged from the Forest Protocol originally adopted by the Board in 2011. Watersheds are easily definable regions which can be identified from numerous websites including Surf Your Watershed at the U.S. EPA (http://cfpub.epa.gov/surf/locate/index.cfm); therefore, no further definition is necessary. The intent of the watershed scale, 10,000 acres or the project area (if smaller than 10,000 acres,) is to define a reasonable area across which the required criteria can be evaluated. If the watershed is larger than 10,000 acres, then a 10,000 acre area will be used for the determination. ARB staff believes that this is a suitable area to ensure that adequate age classes exist across all landscapes. These criteria can be evaluated using

inventories and other records available from the project operator to determine areas of harvest. If the verifier is unable to conclude with reasonable assurance that this requirement has been met using information provided by the project operator, the project would not be in conformance with the protocol.

C-12.18. Comment: Section 5.2.1(b) states "(1) Identifying the total metric tons of CO2e contained in the initial above-ground standing live tree carbon stocks within the project area; and (2) Dividing this amount by the number of acres in the project area." The forest sampling provides results on a per-acre basis, which is then multiplied by the acreage to determine the total. Please consider revising this for consistency. *(FCGHG-1)*

Response: This section of the protocol is unchanged from the Forest Protocol originally adopted by the Board in 2011. Not all projects will start with a per-acre value for the Project Area. Projects that start with a Project Area value must follow this section as written. If a project already has calculated the per-acre value then they would not have to complete this step.

C-12.19. Comment: Section 5.2.1(e)(2)(B) states "providing evidence that activities similar to the proposed baseline growth and harvesting regime have taken place within the past 15 years on other properties within the forest project's assessment area not owned by the forest owner(s) or its affiliates unless the forest owner and/or its affiliates own 50% or more of the land within the assessment area." Again, Assessment Areas are not spatially explicit, but rather they are based on forest ecosystems or communities (groups of species). As such, it is unclear how an OPO can determine what percentage of a given Assessment Area they own. Similar to the above suggestion regarding the LMU definition, ESI suggests modifying the proposed updated requirements to section 5.2.1(e)(2) to apply to "Supersections" vs. Assessment Areas as these are spatially explicit and efficiently verifiable. *(FCGHG-1)*

Response: ARB staff agrees that the "50% or more" ownership requirement in subchapter 5.2.1(e)(2)(B) was difficult to implement and verify, and has modified the protocol via 15-day changes to this rulemaking to remove it.

C-12.20. Comment: Our comments are intended to support more detailed and technical comments from Blue Source, LLC that were submitted to ARB within this comment period, dated December 11, 2014. We believe that three specific Blue Source comments and proposed solutions labeled "Key Issues of Concern Raised in the Proposed Changes to the Protocol in the Regulatory Review Update" effectively capture key technical issues that will impact the long-term effectiveness of the Protocol.

In particular, we are concerned that certain changes to the Protocol identified in the Blue Source comments have the potential to negatively impact the ability of diverse landowners to participate in offset project development. As an organization actively pursuing development of carbon offset projects under the Protocol, The Trust for Public Land has already seen substantial barriers to participation for large-scale working forest landowners. We believe that some of the changes proposed by ARB would narrow even further the range of viable projects on industrial forests, which we believe can provide important contributions to offset supply.

Specifically, we concur with the positions articulated in the Blue Source comments related to:

1) New basal area retention standards and associated buffer areas,

2) Modified method for establishing minimum baseline level (MBL) for IFM projects with initial carbon stocking above Common Practice, and

3) Common Practice values updates.

We believe that further elevating forest practice standards such as the new harvest unit requirements for minimum basal area and modified buffer rules will create an additional barrier to landowners to participate in the offset market. We have seen some large-scale landowners discouraged by the considerable forest management measures already in the current Protocol based on the impact of these requirements on working forest management. The further elevated forest practices requirements cited above would potentially present insurmountable barriers for these landowners.

We have seen that identifying viable projects on large working forest blocks is difficult given that many of these forest properties are managed very close to common practice. Any changes to common practice values and rules relating to the determination of MBL for forest projects must be considered carefully. We concur with Blue Source's analysis that carbon stocks on working forest properties during the 2007-2012 assessment period being utilized for the proposed Common Practice update were artifically inflated due to the impacts of the economic recession on timber harvest. We know from direct dialogue that many landowners were "storing timber on the stump" during this period, and therefore stocking on their properties during this period did not reflect true common practice levels for that forest type and supersection. The proposed changes in the Update pertaining to common practice values and determination of MBL would tip many potentially viable projects out of the market that could otherwise offer real and additional climate benefits.

We encourage ARB to give careful consideration to Blue Source's more detailed technical comments and its proposed solutions on the three items listed above. Thank you very much for your consideration. *(TFPL-1)*

Response: ARB staff is always conscious of the effects of protocol changes on projects, and works to minimize the impacts when possible. Offsets are a key component of the cost containment mechanism for the Regulation, and, especially in the case of forestry, offer many desirable co-benefits. However, the updates identified by the commenter were determined by ARB staff to be essential for the clear and correct application of the protocol. As originally written there was ambiguity about how to determine even-aged harvest are adequately stocked and how to determine the size of the buffer area, which the modification have rectified. The Common Practice values were outdated and did not reflect true common practice, and the minimum baseline equation allowed the potential to manipulate the protocol.

A more detailed response to the even-aged management comment can be found in the response to comment C-3.1 above. A more detailed response to the baseline comment can be found in the response to comment C-4.1 above. And, a more detailed response to the Common Practice comment can be found in response to comment C-6.1 above.

C-12.21. Comment: Decreases in standing live tree carbon stocks over any 10 year consecutive period must be declared at the time of forest project's listing: The proposed Protocol §3.1(b) states that "To be eligible under this protocol, a forest offset project must not…experience a decrease in the standing live tree carbon stocks over any 10 year consecutive period except if…the decrease is associated with a planned balancing of age classes…and is detailed in a long-term management plan…at the time of forest project's listing [emphasis added]."

Background

- The ARB FOP October, 2011 protocol version also contains this requirement. However, no landowners could likely anticipate the interplay of markets, forest health issues, or stand dynamics well enough over 25 years (a crediting period) or even 100 years, to declare with any accuracy their intent, at time of forest project's listing, to balance age classes and thus decrease stocks over any 10 year period during the project's life.

Implications

- Landowners may plan to harvest immediately upon listing of a project and may not feel stocks will decline over a 10 year period. However, due to unforeseen circumstances, if the landowner was unable to harvest immediately following the first verification, carbon stocks could rise to a point where the delayed harvesting would cause standing live carbon stocks to decline over a 10 year period to balance age classes. In this scenario, the

landowner would be out of conformance, because he/she did not give notice during project listing.

Potential solutions

- Unforeseen circumstances arise constantly. Most jurisdictions allow for amendments to forest management plans required for a variety of regulatory purposes, as long as changes are consistent with sound silvicultural principles. Allowing intentions to reduce stocking to be declared at the time of the initial OPDR, verification, or even better, when an annual report is filed, would better reflect the realities of forest management. *(SIGLLC-1)*

  Response: As stated by the commenter, this is an existing requirement of the Forest Protocol originally adopted by the Board in 2011. Subchapter 7.2.1(a)(9) of the Forest Protocol requires the project operator to identify changes in the listing information and provide an update in the Offset Project Data Report. If unforeseen circumstances occur that cause reduced stocking, this can be noted in the annual OPDR. The project would still be subject to all other stocking requirements in the Forest Protocol.

C-12.22. Comment: Wood products stored in the baseline scenario: The quantification methodology for estimating baseline carbon in harvested wood products in IFM projects removed the text, relative to ARB's FOP October, 2011 version, explicitly stating that the quantity was to be averaged over 100 years.

Background

- ARB's October, 2011 Protocol version §6.2.3 (2) states "On an annual basis, determine the amount of harvested carbon that would have remained stored in wood products, averaged over 100 years, following the requirements and methods in Appendix C."
- The corresponding section in the proposed Protocol, §5.2.3 (b), makes no mention of averaging carbon stored in wood products over 100 years, but says, "On an annual basis, determine the amount of carbon in standing live and standing dead trees (bole only, excluding bark) that would have been harvested during the reporting period for the purpose of producing wood products and would have remained stored in wood products over 100 years, following the requirements and methods in appendix C; trees of noncommercial sizes and species are excluded."

Implications

- This proposed change would dramatically increase the estimates of carbon stored in wood products in the baseline scenario.

Proposed Solutions

- We recognize the change in wood product language was likely unintentional. We suggest changing the language to reflect the language in ARB's FOP October, 2011 version where carbon in stored wood products is averaged over 100 years. *(SIGLLC-1)*

  Response: This change is not necessary because the baseline is averaged over 100 years. Equation 5.1 identifies $BC_{wp,y}$ as the averaged annual baseline carbon in wood products that would have remained stored for at least 100 years. The wood products values for each reporting period, as determined in Appendix C, would be averaged over the 100-year baseline.

C-12.23. Comment: "Boots on the ground inventory" should be retained in modified form as a means of demonstrating project commencement date, or the minimum reporting period should be reduced to one month. Previously, ARB accepted 'boots on the ground inventory' as a means of demonstrating a project's commencement date. The proposed protocol would only accept listing, change of ownership or easement recordation as evidence of project commencement. In practice, project listing will become the most frequent evidence of a project's commencement. The data now required by ARB for listing is fairly detailed, and so much of a project can already be complete at the time of project listing. The Cap and Trade Regulation requires a minimum six-month reporting period. The combination of project commencement at listing and a minimum six-month reporting period will unnecessarily delay project enrollment: many projects would be able to verify existing carbon stocks soon after listing but will be forced to wait for the minimum six month reporting period. This delay will adversely affect the timing of offset supply.

We recognize that 'boots on the ground inventory' as project commencement may be difficult to adequately verify in some instances. However, we suggest the remedy is to simply tighten the criteria to ensure that such inventory was actually installed for the purpose of initiating a carbon project under the protocol.

We recommend that ARB either (a) accept "boots on the ground inventory" as a project commencement date IF the offset project operator or Authorized Project Designee can demonstrate through a contemporaneous written instrument that the inventory was specifically being implemented for the purposes of the ARB compliance offset protocol; or (b) allow a minimum reporting period of one month for forest projects. *(NFI-1)*

C-12.24. Comment: Finite Carbon has previously received written guidance from ARB that the commencement of a carbon inventory may serve as an event that would denote Offset Project Commencement for Improved Forest Management

projects. For consistency, we ask that this action should be added to the updated protocol. *(FCC-1)*

> **Response:** ARB staff allowed "boots on the ground" or commencement of a carbon inventory for the commencement date because the language in both the early action offset protocols and the Forest Protocol adopted by the Board in 2011 did not explicitly limit project commencement to the three identified activities in these protocols. As New Forest stated in comment C-12.23, it is difficult to adequately verify "boots on the ground" as project commencement; therefore, ARB staff intentionally limited the project commencement date to the three previously eligible, and easily verifiable activities, effectively removing "boots on the ground" or commencement of a carbon inventory from the protocol as an eligible project commencement date. ARB declines to make the change suggested by the commenter.

C-12.25. Comment: A verifier should not be required to install an entirely new sample if only one sample plot center cannot be relocated. Section 8.1.1(a) of the proposed Protocol states that "If any portion of a project area's sample plots cannot be relocated or measurement of project sample plots is not statistically appropriate, the verifier must install sample plots independent of the project's sample plots." This approach is not required by accepted biostatistics. There may be circumstances in which it is difficult for a verifier to relocate exactly one or two plot centers within a permanent forest inventory: GPS coordinates may not locate the plot center with enough precision, paint may wash off, bears may tear down plot center markers, may be inundated with water, etc. In such circumstances, it would be statistically appropriate to randomly select an alternative plot (the next one in a random sequence).

Therefore we recommend that criteria be specified when a paired sequential sampling test within a strata must be abandoned and replaced with an unpaired test. A suggested criteria for consideration is when 20 percent or more of the plots cannot be relocated (1 out of 5). *(NFI-1)*

> **Response:** Staff agrees with the commenter and modified the protocol during 15-day changes to allow for up to 10.00% of the selected verification plots to be unidentifiable. If a selected plot within the allowable 10.00% cannot be located, the verifier would move to the next sequential randomly selected verification plot.

C-12.26. Comment: Disclosure requirements in the Protocol should not exceed disclosure requirements in the Cap and Trade Regulation. Section 3.8 in the proposed Protocol states that projects must meet the regulatory compliance requirements set forth in Section 95973(b) of the Cap and Trade Regulation. In the very next clause, the Protocol states that the OPO or APD "is required to disclose in

writing to the verifier any and all instances of non-compliance with any legal requirement associated with the project lands." 95973(b) is expressly limited to local, regional and national requirements for environmental impact assessments and all local, regional, and national "environmental and health and safety laws and regulations that apply based on the offset project location and that directly apply to the offset project". Asking for a broader scope of information in the Protocol that is non-actionable under the express terms of the Cap and Trade Regulation places the Protocol in conflict with the Regulation and makes no practical sense. Are OPOs, APDs, verifiers and offset purchasers now required to diligence for securities laws violations related to the project lands? Securities laws can often come into play when timberland is owned by a publicly-listed entity. What about incidents of trespass by third parties? Right of way disputes with neighbors? Contractual disputes with a lessee hunting club? The proposed language would impose significant additional costs on all participants in the system for information that cannot actually be used by ARB because Section 95973 limits the scope of required regulatory compliance for offset issuance to applicable environmental, health and safety laws. More information is not always useful or better. We urge ARB to only seek information from program participants that is directly related to a policy goal or specific provision of the Cap and Trade Regulation.

Similarly, the proposed Section 7.2.1(a)(8) would require for annual reporting a "Statement as to whether the forest project and associated project lands have met and been in compliance with all local, state, or federal regulatory requirements during the reporting period. If not, an explanation of the non- compliance must be provided". This requirement is broader than the regulatory compliance required under the Protocol, which again is limited to environmental, health or safety laws that apply to the project.

We recommend amending Section 3.8 and 7.2.1(a)(8) to only refer to environmental and health and safety laws and regulations that apply based on the offset project location and that directly apply to the offset project. *(NFI-1)*

> **Response:** The disclosure requirements of the Forest Protocol do not exceed the requirements of the Regulation. The requirement to disclose in writing to the verifier all instances of non-compliance with any legal requirement associated with the project lands is unchanged from the Forest Protocol originally adopted by the Board in 2011. Section 95973(b) of the Regulation, which is outside the scope of this rulemaking, is not limited to environmental and health and safety laws. Section 95973(b) states "…The project is out of regulatory compliance if the project is subject to enforcement action by a regulatory oversite body during the Reporting Period…" This is also consistent with the requirements of subchapter 3.7 in the 2011 Forest

Protocol, which states "…Offset projects must also meet any other local, regional, and national requirements that apply."

ARB posted a guidance document in February 2015 entitled "California Air Resources Board Offset Credit Regulatory Conformance and Invalidation Guidance" to provide further clarity on regulatory conformance requirements and the scope of activities that are subject to review for each specific project type.

The document is available on the Compliance Offset Program webpage: http://www.arb.ca.gov/cc/capandtrade/offsets/arboc_guide_regul_conform_invalidation.pdf

C-12.27. Comment: Suggested edits to the sequential sampling section; recommendations for improvement. The following comments highlight issue in Section 8.1.1, itemized by 8.1.1 subsection:

(a) The relocation of sample plots is addressed above in item 6. The evaluation of needing to use an unpaired test should be clarified to be on a stratum basis where appropriate.

(d) The selection of stands is applicable to unpaired tests.

(e) The selection of plots is applicable to paired tests.

(e)(2) Verification plots must reflect the variability in tree species, heights and diameters existing in a project area. This implies a multi-stage sampling design rather than a random plot design, which is an unnecessary complication. If, however, it is retained then the mulita-stage design should be directed as it would be more efficient than a strictly random plot selection.

(e)(4) "…selected within a ~~stand~~strata,…"

(f)(4) All tree heights in plots selected for sequential sampling must be measured. Suggest that this refer to total heights and that merchantable heights be allowed to use taper or regression functions as the measurement error associated with measuring merchantable heights may be greater than the prediction error of the model; and this is the approach used by FIA so it would be consistent with the common practice estimates.

(l) "…partially pass the paired or unpaired test…"

Equation 8.1: Last two lines should be "If result ≤ n," and "If result > n,"

Table 8.1. Finally, the statistical theory for sequential sampling does not call for a minimum number of passing plots. Avoiding an aberration of result due to random

sampling is ensured by the minimum number of plots to be sampled. It is appropriate to pass only one plot to stop the sequential sampling process. *(NFI-1)*

Response: There is no language in the Forest Protocol that prevents a project operator from using an unpaired test on a stratum even though paired tests were used on other strata, and vice versa.

ARB staff agrees that selection of stands is appropriate for unpaired tests, and has made the modification to subchapter 8.1.1(d).

The protocol requires selection of plots for both the paired and unpaired test; therefore, ARB staff is unsure what modification to subchapter 8.1.1 the commenter is requesting.

Random plot design is not mutually exclusive with evaluation of variability. Verification is a risk-based process that already bases selection of stratum on stocking or risk. Subchapter 8.1.1(e)(2) identifies further criteria for verifiers to consider when selecting plots.

Staff agrees that strata is the appropriate boundary for selecting plots in subchapter 8.1.1(e)(2) and has made the suggested change.

For verification, it is appropriate to have the verifiers actually measure the tree heights. The project operator may have used a regression in creating the inventory and the verifier must determine if both the inventory and the modeled growth are accurate.

Staff agrees that both the paired and unpaired test may be partially passed and has made the suggested modification to subchapter 8.1.1(l).

Staff agrees with the comments on equation 8.1 and has made the suggested modifications through the 15-day noticed changes.

Table 8.1 is slightly modified from the Forest Protocol originally adopted by the Board in 2011 to add requirements for projects that have more than 3 strata. A minimum sample size helps ensure the analysis is representative of the population. ARB staff declines to accept the commenter's suggestion.

C-12.28. Comment: The look-back period for the high stocking reference (HSR) should be clarified. Equation 6.6 of the protocol defines the high stocking reference (HSR) as 80% of the highest value for above-ground standing live carbon stocks per acre within the Project Area during the preceding 10-year period. However, if a landowner has recently acquired the land enrolled in the carbon project within the last 10 years, the look-back period should be limited to the length of time that the current landowner has owned the property. Current landowners who want to restore

forestland or manage it more sustainably should not be unduly penalized by the management practices of previous landowners. *(NFI-1)*

> **Response:** This section of the Forest Protocol is unchanged from the protocol originally adopted by the Board in 2011. Ten years is an appropriate timeframe for all projects to ensure that project operators do not attempt to manipulate the baseline by transferring ownership or harvesting, which could result in a reduced minimum baseline.

C-12.29. Comment: Please clarify in section 3.5 that an intentional reversal that has been compensated for per section 95983 of the Regulation does not result in the termination of a project. *(ECOP-1)*

> **Response:** The Forest Protocol or Regulation does not require project termination after an intentional reversal.

C-12.30. Comment: Section 95981(e) of the Regulation states:

(e) Determination for Timing and Duration of Initial Crediting Periods for

Offset Projects Submitted Through ARB. The initial crediting period will begin with the date that the first verified GHG emission reductions and GHG removal enhancements occur, according to the first Positive Offset or Qualified Positive Offset Verification Statement that is received by ARB, unless otherwise specified in a Compliance Offset Protocol. An early action offset project that transitions pursuant to section 95990(k) will begin its initial crediting period pursuant to section 95990(k)(2).

For IFM projects which are above common practice, a minimum initial crediting period is not required since the benefit of the action is not measured over time, but is instead a singular event. The requirement for a minimum 6 month crediting period results in unnecessary delays in the commencement and issuance of IFM projects which are above common practice.

We recommend that language is inserted into the Forest Compliance Protocol which would allow IFM projects above common practice not be required to have a minimum initial crediting period as is currently the case with Ozone Depleting Substances projects. *(FCC-1)*

> **Response:** The requirement for a minimum 6-month reporting period is found in section 95802(a)(332) of the Regulation, and is outside the scope of this rulemaking.

C-12.31. Comment: I have read and I do want to support all of the detailed comments made by Roger Williams of BlueSource, and I want to commend Mr.

Williams for his consideration and efforts relative to commenting upon the proposed rules.

I am a registered forester, an ARB certified lead verifier and also a forest project verifier. I have also worked with land owners who wish to develop forestry projects, some of whom are deterred by the restrictive nature of the forestry protocols. *(EWFA-1)*

> **Response:** ARB's responses to Blue Source's comments can be found throughout this section.

C-12.32. Comment: ARB should provide a summary of the proposed changes, both a narrative summary of all substantive changes as well as a redline version that clearly shows all of the proposed amendments compared to the current Protocol;

ARB should also provide a document that explains the problem being addressed by the proposed changes. When reviewing changes in the current draft we have struggled to understand what problem some of the amendments are trying to address;

Developing offset projects requires significant capital outlay and relatively long lead time. Lack of clarity about pending changes to the offset Protocol generates uncertainty and exacerbates the challenges facing this nascent industry. ARB could reduce this effect by bringing greater clarity and transparency to the process being used to update offset Protocols. Being clearer about the timeline, the issues being considered and the reasons for seeking changes, and holding public workshops with interested stakeholders and experts would improve the process and be consistent with how ARB conducts outreach for other important decisions. *(PFT-1)*

> **Response:** The version of the protocol proposed for adoption during the original 45-day notice and comment period represents a completely new version of the protocol, not an update to the previous protocol. Because it is a new protocol, it is not possible to provide a "redlined" version that compares the new protocol to the previous version. The current proposed amendments include a substantial change in the format of the protocol to be more consistent with the format of the Regulation, while maintaining the majority of the original intent, if not original text. The Initial Statement of Reasons, available on the rulemaking webpage, summarizes the changes from the previous version of the Forest Protocol to the new version, and addresses the reasons for the changes.

C-12.33. Comment: Because constantly shifting provisions in the protocol make it more difficult to use, we would suggest that in annual updates ARB focus on items that are necessary to maintain the accuracy of the quantification, or clarifications that address known problems with implementation. Broader revisions to the Protocol

should be aggregated in more comprehensive reviews less frequently, perhaps every five years. That would help reduce the perception that the methodology is constantly shifting and changing, and would better distinguish between minor clarifications and more major changes to the provisions. *(PFT-1)*

> **Response:** ARB staff initiated the current proposed amendments to the Forest Protocol after it determined that enough data was available to incorporate regions of Alaska into the Forest Protocol. Since adding Alaska required a full rulemaking process and it had been almost five years since the protocol was originally proposed for Board adoption, ARB staff determined this rulemaking process was an appropriate time to propose targeted changes to other areas of the protocol that would benefit from updated data or had been identified as problematic.

C-12.34. Comment: With regard to the current proposed changes to the Forest Protocol, we share many of the concerns that have been expressed by the Climate Action Reserve (CAR) and Blue Source. We suggest ARB use the issues raised in those comments as the core list of issues that merit further discussion and outreach through public workshops in early 2015. (*PFT-1)*

> **Response:** ARB staff has done as the commenter suggests. In February of 2015, ARB staff held a workshop to discuss proposed changes to the Forest Protocol based substantially on comments received on the 45-day version of the protocol. Additionally, staff met individually with numerous stakeholders to discuss issues related to the protocol modifications. ARB staff responses to additional comments raised by the Climate Action Reserve and Blue Source can be found throughout this section.

C-12.35. Comment: In Section 1.2(21) of the current proposed Forest Protocol, “Forest Management” means the commercial or noncommercial growing and harvesting of forests. This definition is too narrow and does not include multiple forest management objectives outside of harvesting. *(SCS-1)*

> **Response:** The definition of “Forest Management” is unchanged from the Forest Protocol originally adopted by the Board in 2011. ARB staff has determined that this definition is sufficient because it includes activities outside of harvesting; it also encompasses the growing of forests, which includes activities such as regeneration, management, and conservation. Without additional detail, ARB staff cannot determine why the commenter believes the definition is too narrow.

C-12.36. Comment: In Section 1.2(38) of the current proposed Forest Protocol, “Professional Forester” means a professional engaged in the science and profession of forestry. For forest projects that occur in a jurisdiction that has professional

forester licensing laws and regulations, a professional forester must be credentialed in that jurisdiction. Where a jurisdiction does not have a professional forester law or regulation, then a professional forester is defined as either having the Certified Forester credentials managed by the Society of American Foresters, or other valid professional forester license or credential approved by a government agency in a different jurisdiction. For forest projects that occur on lands held in trust by the United States for a tribe or a tribal member, or on tribally owned fee land, a Professional Forester with credentials managed by the Society of American Foresters, Tribal Forest Manager, Tribal Timber Sale Officer, Tribal or BIA Officer in Charge, or BIA Regional Forester is sufficient.

The professional forestry credentials from a jurisdiction (e.g. a CA Registered Professional Forester) should also be suitable for tribal lands since a SAF CF is allowed. In addition, jurisdictions that have a professional forester licensing law but it is not a requirement to practice forestry the professional forester credential should not be required. For example, in the state of Michigan, you do not need to be a "registered forester" to practice forestry; it is a voluntary registration. It would be helpful for ARB to provide a list of the states which have a professional forester law or regulations so both OPOs and Verification Bodies are aware of the requirements. *(SCS-1)*

> **Response:** ARB staff selected the requirement of a licensed Professional Forester to ensure that a qualified individual with a documented level of forestry experience evaluates all projects; therefore, a certification is necessary, even in states where it is not required, to demonstrate competence. ARB staff worked with tribes in identifying suitable qualifications for foresters on projects located on tribal lands and considered their recommendations in the development of the protocol. Tribes are sovereign and it is up to the tribe to recognize licensing laws from other jurisdictions. The additional eligible foresters listed for tribal lands are available in case the tribe does not have its own, or recognize other jurisdiction's, licensing laws.

C-12.37. Comment: Section 2.1(b) of the current proposed Forest Protocol states that to be eligible under this protocol, a reforestation project must not: (1) Involve rotational harvesting of reforested trees or any harvesting of pre-existing carbon in live trees during the first 30 years after offset project commencement unless such harvesting is needed to prevent or reduce an imminent threat of disease. Such harvesting may only occur if the Offset Project Operator or Authorized Project Designee provides a written statement from the government agency in charge of forestry regulation in the state where the project is located stipulating that the harvesting is necessary to prevent or mitigate disease; and (2) Undertake tree planting or removal of impediments to natural reforestation if a commercial harvest

of healthy live trees has occurred within 10 years or since the occurrence of a significant disturbance, whichever period is shorter.

The term "and" between sub-sections (1) and (2) is confusing, because, as written, it indicates that the draft revision only precludes instances of circumstances (1) and (2) occurring in combination. From review of Section 2.1 of the prevailing Protocol, it appears that the intent is to preclude instances of circumstances (1) or (2). In this case, it is recommended that "and" be replaced with "or". In addition, sub-section (2), which is a re-wording of Section 2.1.1(3) of the prevailing Protocol, is confusing as written. It is suggested that this sub-section be re-written as follows: "Occur on land within which a commercial harvest a commercial harvest of healthy live trees has occurred within 10 years of offset project commencement or since the occurrence of a significant disturbance, whichever period is shorter." *(SCS-1)*

> **Response:** ARB staff disagrees with the commenter that the section is confusing. The “and” indicates that both statements must be true. If “or” was used, then only one of the two statements would need to be true.

C-12.38. Comment: Section 2.1(b)(1) of the current proposed Forest Protocol Involve rotational harvesting of reforested trees.

The term "rotational harvesting" is not defined. It is recommended that this term be defined or replaced with a defined term. *(SCS-1)*

> **Response:** “Rotational harvesting” is a common term in forestry indicating that areas of the forest are harvested on a rotation of several years. A fifteen year rotational harvest would indicate that once an area is harvested it will not be harvested again for fifteen years. ARB declines to include the definition because the common understanding in the forestry industry matches ARB’s intent.

C-12.39. Comment: Section 3.1(a)(1) of the current proposed Forest Protocol states that if a state/regional reference is unavailable or inadequate, documentation from a state botanist or other qualified independent resource, recognized as expert by academic, private and government organizations, must be submitted indicating that the project promotes and maintains native forests.

It is unclear what "state/regional" references may be "unavailable or inadequate". This should be clarified. *(SCS-1)*

> **Response:** ARB staff agrees that this is unclear and has modified the Forest Protocol accordingly during the 15-day notice and comment period to allow a registered Professional Forester to make the determination that the reference may be inadequate.

C-12.40. Comment: Section 3.1(a)(1) of the current proposed Forest Protocol states that to the extent seed is available, and/or physical site characteristics permit, reforestation projects that involve planting of seedlings must plant a mixture of species such that no single species' prevalence, measured as the percent of all live tree stems in the project area, exceeds the percentage value shown under the heading 'Species Diversity Index' in the Assessment Area Data File associated with this protocol version available on the Forest Offset Protocol Resources section of ARB's website.

This text is confusing because the phrase "plant a mixture of species such that no single species' prevalence" implies that the only opportunity to impact species composition is during planting of trees. In reality, forest managers have the opportunity to impact species composition (through pre-commercial and commercial thinning and other silvicultural treatments) throughout the lifetime of a given stand. If tree planting is deemed to be the only action that can impact species composition so as to comply with the requirement, it is unclear why the requirement needs to be assessed at "all subsequent verifications". It is suggested that the intent of the requirement is merely that an appropriate level of diversity in species composition be maintained throughout the lifetime of a project. Thus, in order to improve clarity and allow for a range of silvicultural options toward this end, and to increase consistency with the requirement for Improved Forest Management and Avoided Conversion Projects, it is suggested that "To the extent seed is available, and/or physical site characteristics permit, reforestation projects that involve planting of seedlings must plant a mixture of species such that no single species' prevalence, measured as the percent of all live tree stems in the project area, exceeds the percentage value shown under the heading 'Species Diversity Index' in the Assessment Area Data File associated with this protocol version available on the Forest Offset Protocol Resources section of ARB's website." be replaced with "To the extent seed is available, and/or physical site characteristics permit, no single species' prevalence, measured as the percent of all live tree stems in the project area, exceeds the percentage value of standing live tree carbon shown under the heading "Species Diversity Index" in the Assessment Area Data File associated with this protocol version available on the Forest Offset Protocol Resources section of ARB's website." *(SCS-1)*

> **Response:** This section is unchanged since the Board originally adopted the Forest Protocol in 2011 with the exception of the date and location of the 'Species Diversity Index'. The intent of this section is to restore native species in the Project Area. Requiring reforestation projects to plant a mixture of species is an easily verifiable method ARB staff selected to result in the percent of all live tree stems in the project area, exceeding the percentage values in the 'Species Diversity Index'.

C-12.41. Comment: Section 3.1(a)(1) of the current proposed Forest Protocol states that all forest landholdings within geographic areas eligible under this protocol (the contiguous United States and eligible portions of Alaska identified on the map available from the Forest Offset Protocol Resources section of ARB's website), including the project area, owned or controlled by the forest owner(s) and its affiliates (as defined in subchapter 3.1(a)(2)) are currently under one or a combination of the following.

All language within this row of Table 3.1 is redundant, as it duplicates requirements contained within Section 3.1(a)(2)(C). It is recommended that the redundant text be deleted. *(SCS-1)*

> **Response:** The three available options for certification are unchanged from the original version of the Forest Protocol adopted by the Board in 2011. Minor clarifications, to the above language, to limit the extent of "all forest landholdings" to the contiguous U.S. and parts of Alaska, and to extend the evaluation to forest owners' affiliates were made. ARB staff determined that having redundant language reinforces the importance of the sustainable harvesting requirements. Also, Table 3.1 provides additional information on how and when the criteria are assessed and the timeline for meeting the criteria that is not stated in subchapter 3.1.

C-12.42. Comment: Section 3.1(b)(1)(E) of the current proposed Forest Protocol states that the decrease in standing live tree carbon stocks occurs after the final crediting period (during the required 100 year monitoring period) and the residual live carbon stocks are maintained at a level that assures all credited standing live tree carbon stocks are permanently maintained.

The criteria by which it should be evaluated whether "the residual live carbon stocks are maintained at a level that assures all credited standing live tree carbon stocks are permanently maintained" are unclear. It is recommended that additional criteria be added to clarify this requirement. *(SCS-1)*

> **Response:** ARB staff disagrees that additional criteria are necessary because the protocol, as written, requires the project operator to monitor, report and undergo verification during the 100-year monitoring period, which will provide the data necessary to determine that all credited standing live carbon stocks are maintained.

C-12.43. Comment: Section 3.2(d) of the current proposed Forest Protocol states that the approval must include an explicit approval of the forest project's baseline.

It is unclear what "approval of the forest project's baseline" means. One possible interpretation is that the language means that the government agency must approve the course of action (e.g., the silvicultural regime) modeled to occur in the baseline

scenario. However, this does not appear entirely logical, as the baseline scenario is typically thought of as the scenario that does not occur. Another possible interpretation is that a government must sanction the description of the baseline scenario as "a conservative estimate of business-as-usual GHG emission reductions or GHG removal enhancements" (per the definition of "Project Baseline" in Section 95802(298) of the Regulation), or some similar language. It is recommended that the meaning of "approval" be clarified. *(SCS-1)*

> **Response:** This section is unchanged from the original version of the Forest Protocol adopted by the Board in 2011. ARB staff disagrees that it is unclear. The baseline is determined according to the provision in Chapter 5 of the protocol and submitted as part of the listing document. The government agency must review all information used in setting the baseline and give approval of the final baseline submitted as part of listing the project.

C-12.44. Comment: Section 3.4.1(c) of the current proposed Forest Protocol states that the legal requirement test is satisfied if... (3) Avoided conversion projects must submit official documentation..."

The quoted text is grammatically incorrect. It is recommended that "Avoided conversion projects must submit official documentation" be replaced with "Avoided conversion projects submit official documentation". *(SCS-1)*

> **Response:** ARB staff agrees with the commenter and has made the change to subchapter 3.4.1(c) during the 15-day notice and comment period.

C-12.45. Comment: Section 3.4.2(b)(3)(A)(7) of the current proposed Forest Protocol states that projects with multiple parcels within a project area must meet the requirement that the alternative land use each parcel has at least a 40 percent greater value than the current forested land use.

It is recommended that "the alternative land use each parcel" be replaced with "the alternative land use for each parcel". Also, it is recommended that "parcel" be defined, given its importance to this language. *(SCS-1)*

> **Response:** ARB staff agrees with the commenter and has made the proposed change to Section 3.4.2(b)(3)(A)7.. However, a parcel is defined by the local planning authority or other local authority, not by the project operator or verifier; therefore, it is not necessary to define "parcel." “Parcel” will have the same definition locally ascribed to it by a governmental agency.

C-12.46. Comment: Section 3.4.2(b)(3)(A)(7) of the current proposed Forest Protocol states that the Offset Project Operator or Authorized Project Designee must sum the individual appraised values for each parcel within the project area when calculating the ACD.

The language is somewhat confusing. It is correct if the appraised values for each parcel are first calculated on a total basis (i.e., equal to the appraised value of each parcel, on a per-acre basis, multiplied by the area of that parcel). However, if the appraised values for each parcel are first calculated on a per-acre basis (as they often are in real-estate appraisals), application of this language will result in failure to properly weight values by parcel area. It is recommended that "sum the individual appraised values for each parcel within the project area" be replaced with either "take the weighted average (weighted by area of each parcel within the project area) of the individual appraised values for each parcel". *(SCS-1)*

> **Response:** To calculate the avoided conversion discount factor it is necessary to have the fair market value of the project area. The total appraised value for each parcel, not the per-acre appraised value for each parcel, must be summed to calculate the fair market value of the project area. If the appraisal is provided as a per-acre appraised value for each parcel, then the project operator must first determine the appraised value of the parcel by multiplying the per-acre appraised value by the parcel acreage. ARB declines to make the requested change because the text is correct as written.

C-12.47. Comment: Sections 4.1(b), 4.2(b), 4.3(b) of the current proposed Forest Protocol states that mechanical site preparation activities are not conducted on contours.

The time scale over which this criterion (stated regarding SSRs RF-6, IFM-6 and AC-6) must be evaluated is unclear. For example, it is not clear whether site preparation activities prior to the project commencement date are considered within the scope of the evaluation. *(SCS-1)*

> **Response:** Subchapter 3.6(a)(1)(C) identifies site preparation as an activity that triggers offset project commencement. Therefore, any site preparation activities would trigger project commencement and would be within the scope of the evaluation.

C-12.48. Comment: Section 5(c), 3.5.2(c) of the current proposed Forest Protocol states that …for reporting period y…

The temporal scopes of the variables Δ AConsite and Δ BConsite have been defined as "since the last reporting period". This is a helpful improvement in clarity over the previous version of the Protocol. However, this is not entirely consistent with the definitions of the variables AConsite,y, AConsite,y-1, CDy, CDy-1, BConsite,y, and BConsite,y-1, which indicate that the respect variables are quantified "for reporting period y" or "for reporting period y-1". This raises the question: for which time in in the reporting period should these variables should be quantified? For greater clarity,

it is recommended that all instances of ""for reporting period y" be replaced with "at the end of reporting period y" and all instances of "for reporting period y-1" be replaced with "at the end of reporting period y-1", which is consistent with the definitions of the variables Δ AConsite and Δ BConsite. It is recommended that corresponding changes be made to Equation 3.1 in Section 3.5.2(c). *(SCS-1)*

> **Response:** ARB staff agrees and has made the requested changes to both equations 3.1 and 5.1 during the 15-day notice and comment period.

C-12.49. Comment: Section 5.1.1 (b) of the current proposed Forest Protocol states that for carbon pools that will be affected by site preparation…

The Protocol does not have a definition of the term "site preparation", as applied in the quoted text. It is recommended that such a definition can be provided. (SCS has experienced one situation where lack of such a definition caused a challenge in interpretation of a similarly worded clause in the Climate Action Reserve's Forest Offset Protocol Version 3.2.) The Dictionary of Forestry (http://www.dictionaryofforestry.org/), published by the Society of American Foresters, is one helpful source for this type of definition. In addition, it is suggested that additional criteria be added for determination of whether a given pool has been "affected by site preparation". For example, some popular herbicide treatments work to control shrub and herbaceous species by limiting their ability to germinate and establish on the site, but does not necessarily actively kill established plants. It is unclear whether or not use of such an herbicide would be deemed to "affect" SSR RF-2 (Shrubs and herbaceous understory carbon). *(SCS-1)*

> **Response:** ARB staff believes that “site preparation” is self-explanatory and does not require further definition and declines to accept the commenter’s suggestion. Any activities undertaken by the project operator to prepare the site for planting or improved growth of existing trees would be considered site preparation.

C-12.50. Comment: Section 5.1.1(d)(1)(A), 5.2.2(e), 5.3.1(d) of the current proposed Forest Protocol states that The baseline for a forest project under this version of the protocol is valid for the duration of the project life following a successful initial verification where the offset project receives a positive verification statement. (1) If correctable errors to the baseline are detected in subsequent verifications, the baseline must be adjusted prior to a verification statement being issued. The corrected baseline would then supersede the originally verified baseline for the purpose of determining GHG emission reductions and GHG removal enhancements going forward. (A) Previously issues ARB offset credits will be subject to the invalidation provisions in section 95985 of the Regulation. (B) In no case will additional ARB offset credit be issued.

It is recommended that "Previously issues ARB offset credits" be replaced with "Previously issued ARB offset credits". It is suggested that additional criteria added for determination of what constitutes a "correctable error". It is recommended that "going forward" be replaced with more precise language (e.g., "for the reporting period for which the offset verification services are being conducted and all subsequent reporting periods"). It is unclear exactly what is meant by the statement "In no case will additional ARB offset credit be issued". This statement could mean that in no case will additional ARB offset credits be issued for prior reporting periods (for which credits have already been issued). It could also mean that in no case will ARB offset credits be issued, throughout the project crediting period) that are in excess of those that would have been issued with the prior (erroneous) baseline in place. It could also mean that both of the previous conditions is true. It is suggested that clarification be provided. *(SCS-1)*

> **Response:** ARB staff agrees with the corrections of “issues” to “issued” and has made the corrections during the 15-day notice and comment period. Any error that the project operator has the ability to correct is considered a correctable error. ARB does not limit the effort or timeframe to correct identified errors. ARB staff disagrees that further corrections are necessary.
>
> "Going forward" indicates that the corrected baseline will be used in all subsequent reporting periods. If the baseline was corrected during the current reporting period, the corrected baseline would also be used for the current reporting period. The "additional credits" refers to credits that the project operator may calculate over the credits previously issued, based on the corrected baseline. Therefore, “additional credits” can only refer to the past where credits have been issued. There would be no additional credits issued in future reporting periods because the project would rely on the corrected baseline.

C-12.51. Comment: Sections 5.1.2(a), 5.1.4(a), 5.3.2(a), 5.3.4(a) of the current proposed Forest Protocol do not appear to have a purpose, since they are not used in the calculation of secondary effects; these sections appear to conflict with guidance in Appendix C (which requires calculation on the basis of the harvested bole only) and are recommended for deletion. *(SCS-1)*

> **Response:** These subchapters are used to calculate baseline and actual harvested carbon, and do not conflict with Appendix C. Appendix C provides a quantification methodology for calculating carbon stored in wood products, which may rely on the harvested carbon, but is a distinct calculation.

C-12.52. Comment: Sections 5.1.2(a), 5.1.4, 5.2.3(a)(2), 5.2.5(a), 5.3.2(a)(2), 5.3.4(a) of the current proposed Forest Protocol states that ...determine the actual

amount of carbon in standing live and standing dead trees (whole tree including belowground biomass and bark)…

For greater clarity, it is recommended that this language be linked to the well-written definitions already included in the Protocol. Thus, it is suggested that "amount of carbon in standing live and standing dead trees (whole tree including belowground biomass and bark)" be replaced with "Standing Live Tree Carbon Stocks and Standing Dead Tree Carbon Stocks". *(SCS-1)*

> **Response:** ARB staff agrees and has made the requested changes during the 15-day notice and comment period.

C-12.53. Comment: Section 5.1.3, 5.2.4, 5.3.3, 6(f) of the current proposed Forest Protocol states that (a) Incorporate any new forest inventory data obtained during the previous reporting period into the inventory estimate. Any plots sampled during the previous reporting period must be incorporated into the inventory estimate; (b) Use an approved model to “grow” (project forward) prior-year data from existing forest inventory plots to the current reporting year, per the requirements of appendix B; (c) Update the forest inventory estimate for harvests and/or disturbances that have occurred during the previous reporting period; and (d) Apply an appropriate confidence deduction for the inventory based on its statistical uncertainty, following the requirements and methods in appendix A.

It is recommended that, for greater clarity, elegance and consistency with Section 5(c), the following changes be made: Replace "during the previous reporting period" with "during the reporting period" Replace "to the current reporting year" with "to the end of the reporting period" Replace "during the previous reporting period" with "during the reporting period" It is recommended that corresponding changes be made to Section 6(f). *(SCS-1)*

> **Response:** ARB staff agrees and has made the requested changes during the 15-day notice and comment period.

C-12.54. Comment: Section 5.2.3(a), 5.2.5(a), 5.2.6, 5.3.2(a), 5.3.5(a), 5.2.6 of the current proposed Forest Protocol states that AChv,n for use in equations 5.10, C.8, and C.17)… BChv,n for use in equations 5.10, C.8, and C.17)…

The references to Equations C.8 and C.17 in these sections are incorrect (and recommended for deletion), since the end result of sections 5.2.3(a), 5.2.5(a), 5.3.2(a), and 5.3.5(a) is the calculation of secondary effects (not the calculations of Appendix C). It is understood that the confusion is caused, in part, by the use of the variable names AChv,n and BChv,n for both the calculation of secondary effects and the calculations of Appendix C (it is recommended that this confusion be minimized by using different variable names for the two processes). *(SCS-1)*

Response: ARB staff has changed the variable name in equation 5.10 to eliminate the confusion of having two equations use the same variable. However, ARB staff disagrees with the commenter's assertion that $AC_{hv,n}$ and $BC_{hv,n}$ are for secondary effects. The values obtained from these subchapters are the appropriate values for use in equation C.8 and C.17 to calculate the carbon stored in wood products. Secondary effects are evaluated in equation 5.10 with the renamed variables.

C-12.55. Comment: Section 7.1.1(13) of the current proposed Forest Protocol states that if the forest project is located on public land, describe the approval process and public vetting processes necessary to evaluate management and policy decisions concerning the offset project that has or will take place in order to obtain approval of the offset project's management activities and baseline.

This requirement should be applicable only when the public land baseline procedure in Section 5.2.2 is applicable (per Section 5.2). It is recommended that "on public land" be replaced with "on land that was publicly owned prior to the offset project commencement date". *(SCS-1)*

Response: This provision is unchanged from the original Forest Protocol adopted by the Board in 2011. For projects that occur on public lands it is important for the public process to be adequately documented to ensure that the involvement of the public lands in the offset protocol is a transparent process.

C-12.56. Comment: The draft revision contains instances, throughout, where definitions of terms defined in Section 1.2(a) are either repeated or paraphrased elsewhere within the draft revision. It is recommended that this be avoided, as it results in the following: 1. In some cases, the potential for a more cluttered and confusing text (e.g., it is stated in Section 3.1(a)(4)(B) that "Open canopy harvest units, harvest units with an area of 3 acres or greater that have less than 50 square feet of basal area retention, must have a buffer area of forest vegetation containing at least 50 square feet of basal area retention must surround the harvest unit"; the definition of "open canopy harvest unit" has been repeated within the text in such a manner that it is not clear whether "harvest units with an area of 3 acres or greater that have less than 50 square feet of basal area retention" are different from, or the same as, "open canopy harvest units") 2. In some cases, the potential for slightly different definitions to be applied, leading to a potential for internal inconsistency (e.g., "Significant Disturbance" appears to be paraphrased within Section 2.1(a)(2) as an event that "resulted in a loss of at least 20 percent of the land's above-ground standing live tree biomass"; this is not entirely consistent with the full definition of this term, but is sufficiently similar to make it unclear whether the two descriptions of "Significant Disturbance" are contradictory) In summary, it is recommended that all

descriptions of defined terms be restricted to Section 1.2(a), unless a compelling reason exists to the contrary for a specific instance. *(SCS-1)*

> **Response:** The term “Open Canopy Harvest Unit” has been removed. In the instance cited by the commenter, the use of “significant disturbance” is consistent in both cases; therefore, no change is necessary.

C-12.57. Comment: In many cases, the draft revision has adopted the convention (as also adopted in the Cap-and-Trade Regulation) of capitalizing defined terms. SCS supports this convention, as it facilitates use of the Protocol. However, this convention has not been adopted with complete consistency, as shown in the following examples: 1. "Reforestation Project" is not capitalized in Section 2.1 2. "Significant Disturbance” is not capitalized in Section 2.1(a)(2) 3. "Open canopy harvest unit" is not capitalized in Section 3.1(a)(4)(B) 4. “Basal Area” and “Basal Area Retention” are not capitalized in Section 3.1(a)(4)(B) For maximum clarity, it is recommended that capitalization be employed in all instances of usage of defined terms. *(SCS-1)*

> **Response:** By convention all terms are capitalized in the definitions section; however, capitalization is not maintained throughout the document, and is used as grammatically required. Instances of non-capitalization do not imply a different definition of the term.

C-12.58. Comment: The terms "above-ground standing live tree carbon stocks" and "above-ground standing live tree biomass" are used several times within the draft revision, but are not defined within Section 1.2(a). "Above-Ground Live Biomass" is defined within Section 1.2(a) but used only once, in Section 7.1.2(a)(1). "Below-ground standing live tree carbon stocks" is not defined within Section 1.2(a). The following actions are suggested: 1. Provide a definition for "above-ground standing live tree carbon stocks" and "below-ground standing live tree carbon stocks" within Section 1.2(a). 2. Replace "above-ground standing live tree biomass" with "above-ground standing live tree carbon stocks" ("above-ground standing live tree biomass" is only used in the context of the definition of a significant disturbance as a "natural impact that results in a loss of at least 20 percent of the above-ground standing live tree biomass", and, as calculated using the approach mandated by the Protocol, 20 percent of the above-ground standing live tree carbon stocks is, by definition, equivalent to 20 percent of the above-ground standing live tree biomass, so the inclusion of the two separate terms is redundant). 3. Replace "Above-Ground Live Biomass" with "above-ground standing live tree carbon stocks" for consistency with the definition of "Significant Disturbance" (as in action #2 above). (Biomass in shrub cover is generally not quantifiable and generally not of interest with respect to the definition of a "Significant Disturbance". Any loss in biomass in shrub cover is likely to be transient in any case, as shrubs are, generally speaking, likely to re-

occupy a site within a few years of a disturbance.) 4. Remove the definition of "Above-Ground Live Biomass from Section 1.2(a). *(SCS-1)*

> **Response:** ARB staff agrees with the commenter and has provided consistency in the terminology for above- and below-ground standing live tree carbon stocks. Carbon stocks are referring to the carbon in biomass, and in some instances the protocol is truly referring to biomass and not carbon stocks. There is an additional step to convert from biomass to carbon that is not necessary under the specific situations identified in the protocol. In those situations, including in the definition of significant disturbance, the term biomass was left unchanged. ARB declines to include the definitions because the common understanding in the forestry industry matches ARB's use of the terms.

C-12.59. Comment: The draft revision contains the following instances of temporal references to offset verification services: 1. "May have boundaries that are not finalized until the second full verification. The boundary that is set at the second site visit verification shall be the Project Area boundary for the duration of the project, provided that: (A) All lands included in the project area were initially included in the project area during listing; and (B) The project has elected to defer its initial inventory until the second full verification" (Section 2.1(c)(2)) 2. "Must be finalized by the conclusion of the initial verification" (Sections 2.2(b)(1) and 2.3(b)(1)) SCS suggests the following: 1. "Verification" does not occur at a single moment in team. Rather, offset verification services occur over a period of, generally, at least several months. Therefore, it would be more precise, where it is desired to refer to "verification" in this manner, to clarify what point in the verification process is being referred to (as is done in instance #2 above). 2. As the review process for a given OPDR does not end with completion of offset verification services, but also involves review by the applicable OPR and by ARB, it is suggested that the above references to "verification" be replaced with the corresponding action by ARB (e.g., issuance of ARB offset credits). Otherwise, it is possible that a change to the project boundary, as required by ARB or the OPR, may not be possible because it would occur after conclusion of offset verification services. *(SCS-1)*

> **Response:** ARB staff understands that verification may occur over an extended timeframe. ARB staff has made modifications to the protocol during the 15-day notice and comment period to clarify that project boundaries are not finalized until the completion of the second full verification. The verification is not considered complete until reviewed by an Offset Project Registry and ARB; therefore, completion of the verification is an appropriate point in time to finalize the project boundaries.

C-12.59. Comment: It is recommended that the parameters BChv,n and AChv,n be renamed BChv,y and AChv,y, respectively, for greater consistency with the sybmbology used elsewhere in the Protocol. *(SCS-1)*

> **Response:** ARB disagrees with the suggested change. The subscript "n" is appropriate because the parameters are summed from reporting periods 1 to "y" with "y" denoting the current reporting period.

C-12.60. Comment: One of the things that I wanted to clarify and I think it would be useful for you in your Board capacity to make sure and note in your Resolution that you're going to pass here says that it is really not your intention to try to do the Board of Forestry or the Department of Fish and Game or the Fish and Game Commission's job. And that while we did work for five years -- I was a member of the stakeholder work group, we did work for five years to bring forward the rules that you currently have. Twice in this process, once with CAR and once with this Board, we had to actually ask for them back to fix what got changed in the process of trying to take the complicated language and move it forward.

And I would recommend that you add a note there that it is not your intention to increase the forest practice rules of the state of California via carbon projects. And so that would really help to stabilize the issue that we ran into. I mean, we're sitting here and we have three -- or five projects actually in the hopper working towards offset generation. And within the time frame of submission to verification, we see a shuttering of the rule system that we're supposed to be working under. We're trying to make a promise to the people of the state and to the Air Board of a 100-year commitment to a certain level of carbon retention on the property or in fact increasing carbon on the property. And we have a rule that changes the game rather dramatically.

And I don't believe it was intentionally done that way. I think it's that there is in addition to the many years of the stakeholder work group, there is a 35 year history of rulemaking in forestry in this state of California already. And that they are complicated and difficult.

It would be useful for the Board to actually add that to the Resolution so it was clear that the intent of the Board is to harmonize the protocol with the other state Commissions and Boards already existing regulations. That would help give us a lot more stability. I think from our perspective as a family-owned company, 100-year commitment its something we're willing to make. But it is scary this short into the process to find a rule change as dramatic as that. Thank you for your time. *(SPI-2)*

> **Response:** The Board verbally directed ARB staff to work with the Board of Forestry and the Department of Forestry and Fire Protection, which ARB staff did. However, this direction was not included in the Resolution the Board

passed at the December 2014 Board hearing. The verbal direction provided by the Board can be found in the Board hearing transcript.

C-12.61. Multiple Comment: So just in the context of approaching this rather than trying to make the protocol a carbon copy of the Forest Practices Act, it would be much better to do a frequently asked question guidance document for land owners who haven't had the joyful experience of working under the California Forest Practices Act for the last 30 years as well. *(SPI-2)*

Comment: One thing we would like to encourage is continued collaboration and communication in hopes that we can provide continued service and continued integrity to the application of the regulation and protocols.

One thing that we would like to request is guidance documents or any sorts of FAQs that could help us provide written guidance to the projects we are verifying, their program staff, but also to provide consistency to the work that we are doing. *(SCS-2)*

> **Response:** At the June 25, 2015, Board hearing where the updated Forest Protocol was adopted, the Board directed ARB staff to develop a guidance document for the protocol. ARB staff plans to conduct a series of public meetings and publicly release draft documents for comment prior to finalizing the guidance document.

C-12.62. Comment: One thing I'll note is that 14 of our 15 projects are outside of the state of California. The level, the threshold we're already asking them to come to is significantly higher than what are already in place in other states. So that's one thing about the good impact the protocols are having outside of the state. I would like to take this time to commend the Air Resources Board for its published intention to more actively seek feedback from the stakeholder community as the current proposed language is reviewed and modified. ARB's forest staff is challenged with managing a very complicated protocol and to date has done an extraordinary job given the volume and difficulty of work they must perform.

However, as demonstrated by the backlog of early action projects awaiting approval and the unfilled positions posted for new hires, ARB's forest division has staffing workload challenges. ARB's intention to host technical workshops to discuss the proposed changes and seek wider stakeholder input during the development of new policy will promote more efficient use of staff resources. *(FCC-2)*

> **Response:** ARB staff thanks the commenter for their support. As stated at the June 25, 2015, Board hearing, ARB has taken steps to address the issue of staff hiring and the early action project backlog. Staff has utilized technical workgroups in the past, and will continue to do so in the future.

C-12.63. Multiple Comments: Project baselines should not be amended after verification of the initial offset project data report. Prior to the amendment in Section 5.2.1(h), the protocol stated explicitly that baselines would not be altered after verification of the initial offset project data report for a project. Stable baselines serve important policy goals. First, stable baselines encourage program participation by giving participants reasonable commercial assurance that changes in protocol interpretation, scientific advances in quantification, or minor errors in baseline calculation do not force significant time and expense in recalculation of baselines or significant expense in invalidation of offset credits. Second, stable baselines reflect a reasonable policy position that 'the perfect should not be the enemy of the good': as the protocol and quantification methods and procedures advance, these methods should apply to new participants, but existing participants should not be forced to continuously 're-do' their project as new 'correctable errors' are found. What is an error based on new information or new policy interpretation may not have been an error at the time of project implementation.

The protocol and Cap and Trade Regulation already have a method for dealing with significant errors in quantification: greater than 5% over-issuance of offset credits can trigger invalidation of the over-issuance. This provision would cover baseline mis-quantification. Thus, the protocol and regulation already address the core concern over materially incorrect baselines. 5.2.1(h) could be interpreted to require invalidation of offsets due to a .01% over-issuance, contradicting the Cap and Trade Regulation's clear text and intent on the subject of offset over-issuance.

Even if 5.2.1(h) is not read to allow for invalidation of offsets for minor over-issuance, correction of baselines due to minute 'errors' imposes significant expense on program participants for no valid policy objective. Staff has stated that they don't want 'incorrect' baselines to be in the system, and if there is a .1% error it should be corrected, even if such error does not lead to any offset credit invalidation. This ignores the fact that correcting a .1% 'error' that has no impact on offset issuance could take in some circumstances 80 person hours and significant additional verification time, and therefore involve significant expense for offset project operators and authorized project designees. Furthermore, what is viewed in the future as a 'correctable error' could be due to changed protocol interpretation rather than real errors in measurement or calculation. This risk is compounded by the fact that Section 5.2.1(h) has no time limit; an offset project operator could be forced under Section 5.2.1(h) to expend significant resources to amend a baseline with an immaterial 'error' twenty years after that baseline was verified.

ARB should recognize that the nature of forest carbon quantification, and the underlying biostatistics and modelling, inherently involves a degree of uncertainty, which is compounded by judgment calls of the project developer, verifier, and ARB in applying a set of rules to extremely varied 'on the ground' situations. The best

forest carbon inventories have sampling error of 3-5% at the 90% confidence interval; that is we are 90% confident that the underlying real value is within 3-5% of the sampled value. The sampled value is not the 'true' value; rather there is a range of truth. Invalidation of offsets due to >5% over-issuance would correct baselines that were shown to have diverged from that acceptable range of truth.

Section 5.2.1(h) is unnecessary in light of existing Cap and Trade Regulation provisions that would cause re-statement of baselines and invalidation of offsets due in circumstances of >5% over-issuance. Section 5.2.1(h) would impose significant costs on program participants for no valid policy goal. We recommend that the proposed Section 5.2.1(h) be deleted. *(NFI-1)*

Comment: If Section 5.2.1(h) is not deleted, its relationship to Section 95985 of the Cap and Trade Regulation should be clarified. In the event that ARB unreasonably decides to require revision of baselines for immaterial errors, ARB should clarify that baseline revisions that lead to <5% restatement of issued offsets cannot cause offset credit invalidation. *(NFI-1)*

> **Response:** The new provision regarding baseline modification does not extend ARB's authority to invalidate offsets. Invalidation is still limited to an overstatement of more than 5.00 percent as identified in section 95985(c)(1)(A) of the Regulation. ARB staff agrees that there is no need to constantly modify the baseline for small errors, and has modified the protocol during the 15-day notice and comment period to only require changes to the baseline for errors greater than 5.00 percent.

C-12.64. Comment: Section §95802 Definitions (381) of the current Regulation states that the current unintentional reversal definition does not explicitly exempt salvage harvests activities from triggering intentional reversals. As salvage harvests occur in the wake of natural disasters (insect infestation, hurricane, etc.) and are intended to improve forest health, they should not be subjected to intentional reversal penalties

Proposed Resolution: The unintentional reversal definition should be modified to specify that salvage harvests activities will not constitute intentional reversal. *(BLUESOURCE-1)*

> **Response:** ARB staff declines to adopt the suggestion because the definition of intentional reversal in the Forest Protocol originally adopted by the Board in 2011 did not exclude salvage harvest. The intentional removal of carbon from the forest is technically a reversal. ARB staff will continue to work with stakeholders on this issue and propose future amendments, as appropriate.

C-12.66. Comment: The adjustments to the classification of high and low site class for determining common practice lack clarity. Item (d) in Appendix F uses the terms "site class productivity class" and "basal area growth" to define high and low site classes, yet does not cite or define these terms. Item (e) contradicts itself, providing four options for determining site class (soils data from federal agency, direct site class data from state or federal agency, attestation of state forester, or field analysis), and in the subsequent sentence requiring the Offset Project Operator (OPO) to demonstrate field analysis to determine high and low site class. Please clarify how site class is to be determined by the OPO. *(ECOP-1)*

> **Response:** ARB staff believes that both terms are self-explanatory and do not require further definition and declines to accept the commenter's suggestion. The site class productivity codes are values (I-VII) determined by the FIA to identify the productivity of the forestland. The basal area growth is the annual average basal area increase per acre of trees. Appendix F provides four options for determining site class. Any option that is chosen must be documented for the verifier. If the field analysis option is selected, then the method prescribed by the FIA Guide must be used.

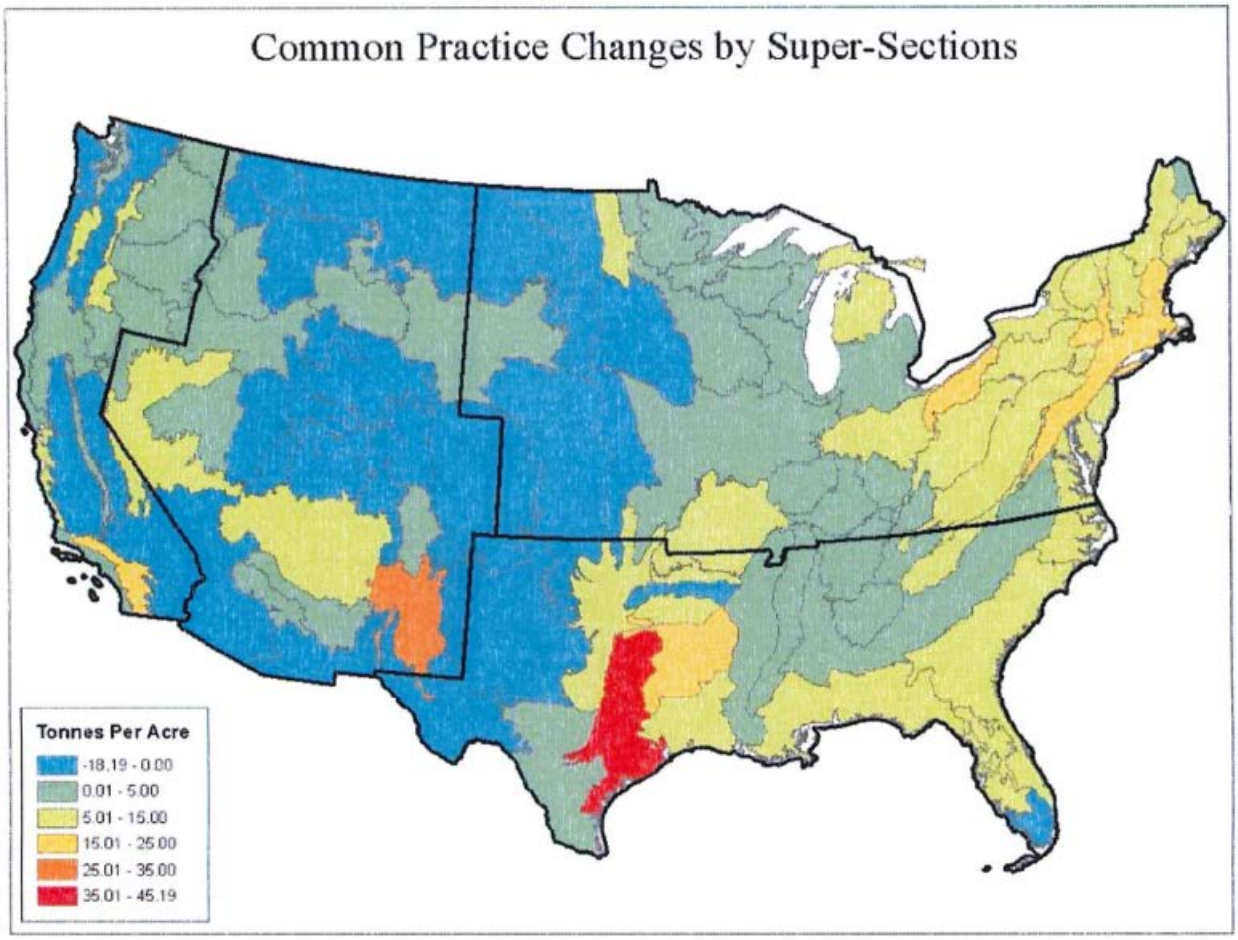
C-12.67. Comment: Revisions to the Common Practice figures and site class breaks are technically accurate and necessary. New Forests recognizes that the Common Practice figures must be updated periodically to reflect updated data from the US Forest Service FIA system. We believe that the site class break chosen by the Forest Service to distinguish between "high" and "low" site was not correctly chosen and places the vast majority of working forests into "high" site class (in our view it should be between Class 3 and Class 4 rather than between Class 4 and Class 5). However, the protocol site class division must mirror the division chosen by the US Forest Service and so we believe the proposed changes are technically accurate and necessary.

We urge ARB to discuss a more appropriate site class division with the US Forest Service for future updates so that the landscape-level distribution of acreage in productive forestlands is more evenly distributed between the low and high site categories. We further urge ARB to only update the Common Practice figures infrequently, perhaps every five years as the USFS updates their FIA data. Finally, we note that staff has given adequate notice of such changes to stakeholders under California administrative law and we suggest that the quantitative changes be adopted without further delay. *(NFI-1)*

> **Response:** As explained in the webinar for the Common Practice update in October 2014, the site class break was based on the data used to determine Common Practice. The changes requested are not being made because as noted by the commenter, even though the commenter disagrees on the class break chosen, the commenter acknowledges that the break for the Common

Practice values must be mirrored in the high and low site class determination for the project. ARB staff intends to work with FIA and stakeholders to develop future updates to the Common Practice values.

C-12.68. Comment: Green Assets supports the ARB's revised Common Practice values which incorporate recently available data from 2006-2012. The proposed amendment regarding Common Practice values is based on specific super-sections across the country. The map below depicts recent updates to Common Practice values in the Protocol. Green Assets supports this compartmentalized approach as the most appropriate technique to promote an accurate Protocol. Our team observes that a similar approach would be appropriate and systemically effective in determining Site Classification.



It is our interpretation and understanding that a much broader method for Site Classification has been presented in "Appendix F- Determining a Value for Common Practice" of the proposed Protocol. Within this amendment, a fixed Site Class categorization is applied to the entire country, although the

FIA divides the U.S. into four geographic regions.

A review of the 2006-2012 FIA growth rates for forestland that is eligible for carbon offset project development (excluding federal lands) demonstrates the variability that exists from among regions.

Southern Region	67 ft3/acre/year
Northern Region	43 ft3/acre/year
Interior Region	16 ft3/acre/year
Pacific Region	Data unavailable

Given the significant level of variability across the U.S., broadly applying a single Site Class Categorization is an inexact application. The recently available FIA data provides an effective framework to develop a proportional site class category specific to each FIA region in order to develop the most accurate Protocol.

This amendment redefines High Site Class to include Site Class IV (85-119 ft3/acre/year). Approximately 45 million acres of Southeastern forestland with the potential for carbon offset project development fall into Class IV, accounting for roughly 23% of all Southeastern woodlands. The ARB has successfully maintained transparency throughout the Protocol development process; however, the rationale for this reclassification is not clearly defined.

In light of the fact that the proposed amendment would have a significant impact on future projects, further study of its implications and practical impact are warranted. Our team supports a regional application of Site Class determination that would improve the accuracy of the Protocol. To address these issues, Green Assets recommends organizing a panel of forest professionals from each of the FIA regions to determine the applicability of the new Site Classification. *(GA-1)*

> **Response:** As ARB staff explained in the webinar on the Common Practice update in October of 2014, the site class break was based on the data used to determine Common Practice. In determining the new Common Practice values, ARB staff used the existing template established by the Climate Action Reserve for the development of their voluntary protocols, which were subsequently adopted by ARB as early action quantification methodologies. The same Common Practice values were incorporated into the Forest Protocol adopted by the Board in 2011. Based on the original site class breaks used by the Climate Action Reserve, I-IV and V-VII site classes were the most common break, with a variety of other breaks also used. The additional data collected by the FIA since the Common Practice values were originally developed allowed the determination of the majority of Common Practice values as I-IV and V-VII site classes, with the remainder calculated

as single class from I-VII site classes. To be consistent with the Common Practice values, the site class break was set between classes IV and V.

D. CAP-AND-TRADE REGULATION

D-1. Regulatory Conformance and Invalidation

D-1.1. Multiple Comments: Sections 95973(b) of the Cap and Trade Regulations specifies that compliance with environmental, health and safety laws and regulations is only relevant to the extent such laws and regulations directly apply to the offset project. Section 95985(c)(2) also specifies that ARB may invalidate offset credits for noncompliance with laws to the extent such noncompliance pertains to the offset project activity and implementation of the offset project. While these provisions are clear, the underlying definitions of "offset project" and "offset project boundary" are ambiguous and overly broad as they potentially apply to activities that are unrelated to a forest carbon project. It is also unclear what constitutes a violation, and it is extremely important to ensure that violations not related to the actual offset project activities will not be grounds for invalidation.

Additionally, Section 95973(b) states that offset credits from an entire reporting are not eligible for issuance if the offset project was out of compliance during the reporting period. For many offset project types with typical reporting periods spanning long periods of time, it seems inappropriate to penalize an entire reporting period (perhaps 1 year of offsets) for a violation that may have been incurred and rectified within a matter of days.

The ambiguity of the regulations as described above makes it extremely difficult for market participants to establish the probability and magnitude of risks related to compliance with laws requirements. If offsets are to continue to play a role in California's landmark AB32 Cap and Trade program, it is critical that more specificity and clear boundaries on offset project activities and timing of violations be provided.

Proposed Solution

The Protocol and the Regulations should be modified to clarify that the only activities in the Project Area designed to increase removals of CO_2 from the atmosphere or reduce or prevent emissions of CO_2 would give rise to an invalidation. Violations that occur on the Project Area related to, for example, harvesting activity and equipment, snowmobiling, hiking, birding, migratory pathways, hunting, etc. would not give rise to an invalidation as they are not

activities designed to increase removals of CO_2 emissions or prevent CO_2 emissions.

Further, the Protocol should clarify that only fully adjudicated violations that directly affect the number of credits issued from the Project would give rise to invalidation and that simple citations would not be a sufficient basis for invalidating credits issued.

Finally, clarification should be provided specifying that only credits arising during the period of the actual violation could be subject to invalidation rather than all credits arising during the entire Reporting Period. Forest carbon projects are particularly susceptible to this reality, as a majority of the credits from a Forest Project may be issued in the first Reporting Period and, in the instance of a violation occurring inside this initial reporting period, invalidating all of the credits for a one-day or one-time violation would be unreasonable. (*BLUESOURCE-1*)

Comment: One other thing is we would like more clarification about invalidation. That's one of the big bulks of what we do. And our concern is how much should we do and what is sufficient. So one thing we'd like to work with you is find guidance about the health and safety laws and what we need to be doing to ensure that we are doing our job competently and to your satisfaction. *(NFI-2)*

Comment: Hello. Thanks for the time. Tony Brunello representing CE2 Carbon Capitol.

I'll be very brief. We worked closely with the staff, Rajinder and Greg, Jessica, Ellen, others, Chair and a few other Board members specifically talking about the invalidation issues. I think it's been addressed by Tom, IETA, a number of folks today.

The main thing that I think is being done and we've been told and reference it's just a matter of timing and specificity around this invalidation topic.

So my only comment today as the Board is there's great opportunity to provide more detail and specificity around the borders on this topic. Again, I think staff know full well of the issue. We just hope there can be some guidance in the near term. So anyway, that's all I have to say. Thank you very much. *(CE2-2)*

Comment: Third, I'd like to few words about offset invalidation. New Forest supports the offsets invalidation rules. It is the right policy to foster detailed due diligence of the offset supply chain. However, at present, the invalidation rules are too non-specific to enable market participants, including verifiers, to adequately diligence invalidation risk.

And we urge ARB staff to issue detailed guidance an invalidation related to the forest protocol that first specifies that only environmental health and safety violations that effect the actual forest carbon stocks can trigger violations, not an OSHA violation of a logger not wearing a hard hat or a culvert that's not up to Water Board regulations.

Also to clarify what constitutes an environmental health and safety violation. Excluding regulatory corrective action letters and specifying an actual civil judgment or criminal conviction or submission of wrong doing such that people can understand what to diligence in evaluating this risk. *(NFI-2)*

Comment: The recent Clean Harbors Ozone Depleting Substances (ODS) investigation brought to light a lack of clarity regarding several aspects of whether or not California offset projects sufficiently meet regulatory compliance requirements under California's cap and trade regulation. This lack of clarity – along with the Clean Harbors' investigation experience and final determination – is impacting the supply of offsets and introduced uncertainty to the market about how regulatory compliance will be applied to *all offset project types*, especially those that are required to have subsequent 12-month reporting periods. **This ambiguity of regulatory and protocol compliance language makes it extremely difficult for market participants to establish the probability and magnitude of risks related to compliance with laws requirements**. If offsets are to continue to play an important cost-containment role in California's cap and trade program, it is critical that more specific language and clear boundaries on offset project activities and timing of violations be provided. These issues, and proposed recommendations, are described in more detail below.

Project Activity & Boundary Definitions

Sections 95973(b) of the Regulations specifies that compliance with environmental, health and safety laws and regulations is only relevant to the extent such laws and regulations directly apply to the offset project. Section 95985(c)(2) also specifies that ARB may invalidate offset credits for non-compliance with laws to the extent such non-compliance pertains to the offset project activity and implementation of the offset project. While these provisions are clear, the underlying definitions of "offset project" and "offset project boundary" are ambiguous and overly broad as they potentially apply to activities that are unrelated to an offset project.

IETA recommends that the Regulation and revised protocols be modified to clarify that **only activities in the Project Area, designed to increase removals of greenhouse gas emissions from the atmosphere or reduce/prevent emissions, could potentially lead to an invalidation**.

Violation Definition

It is also unclear what constitutes a violation. We believe it is extremely important to ensure that violations unrelated to actual offset project activities will not be grounds for invalidation. Protocol language should clarify that only fully adjudicated violations, which directly affect the number of credits issued from a project, give rise to potential invalidation**.** Further, citation is not proof of violation and should not form a sufficient basis for invalidating credits issued. **We recommend that only a confirmed formal violation notice should trigger an invalidation investigation**.[12]

Violation & Reporting Period

Section 95973(b) also states that offset credits from an entire reporting period are not eligible for issuance, if the offset project was out of compliance during the reporting period. For many offset project types with typical reporting periods spanning long periods of time, it seems inappropriate to penalize an entire reporting period for a violation that may have been incurred and rectified within a matter of days. We therefore ask ARB to provide **clarification specifying that only credits arising during the period of an actual violation could potentially be subject to invalidation** rather than all credits arising during the entire Reporting Period.[13] *(IETA-1)*

Comment: The recent final decision of the Clean Harbors investigation has introduced a great deal of uncertainty to the market as to how regulatory compliance will be applied to all project types. As a verification body, RCE understands the burden of reviewing and confirming regulatory compliance for projects. To that end, RCE requests ARB provide additional guidance to further clarify the required process for determining regulatory compliance. We believe additional guidance will benefit all COPs, but will be especially important for all Mine Methane Capture (MMC) projects given the large number of citations and violations that are issued by MSHA at U.S. mines each year. RCE offers the following suggestions:

Clarify “Project Activities” Definition

RCE realizes that there are a variety of potential methods for limiting the scope of regulatory compliance to “project activities,” as defined in §95973(b). RCE is supportive of any method that reasonably reduces the scope of regulatory compliance to project activities, while still ensuring that the environmental integrity of the offset project is maintained.

[12] In the case of mines, for instance, many entities receive citations that are never escalated to violations

[13] Forest carbon projects, in particular, are susceptible to this reality, as a majority of the credits from a Forest Project may be issued in the first Reporting Period and, in the instance of a violation occurring inside this initial reporting period, invalidating all of the credits for a one-day or one-time violation would be unreasonable.

From a verification perspective, without a clear boundary for project activities, the verification process for confirming regulatory compliance is extremely difficult and will become untenable for MMC projects. Using the example of an MMC project – if a verification body must review all notices from regulatory oversight bodies (citations, alleged violations, etc.) for the mining activities where a project is located, it would require an exceedingly time consuming process while greatly increasing the cost and duration of verifications. A single mine can easily have over 100 citations/violation per year; in fact, MSHA issued over 80,000 citations/violations to U.S. mines in 2012 alone. We believe a full review of regulatory compliance at coal mines is beyond the scope of verification for an offset project.

In addition, specific guidance on what project activities to include within the scope of review would provide much needed certainty to verifiers during our verification process. Given the large number of potential citations/violations at mines and, it will be extremely difficult for verification bodies to correctly interpret what violations are directly applicable to project activities without additional guidance from ARB. While our professional judgment might lead us to one interpretation, this interpretation might not concur ARB's. If clear guidance is not given on what is directly applicable and how project activities are defined, RCE is concerned that expert judgment by us (non-legal experts) will lead to incorrect determinations in addition to frequent requests for guidance and clarification from OPRs and ARB on a case-by-case basis.

Violation Threshold

We are supportive of the establishment of a minimum threshold for citations and violations that would cause an offset project to be out regulatory compliance. As noted above, mines are frequently cited with violations, many of which are minor in nature. Examples of minor violations include record keeping errors, missed inspections on fire extinguishers, unclean bathrooms, or missing lock washers on mine equipment. None of these items cause significant environmental harm or would impact the integrity of any offset credits generated, but all would be official violations.

Even if we assume that the boundary for project activities is clarified, for example, to remove mine operations, there could still be minor violations that occur related to project activities. We believe items such as these should be excluded from what can cause an offset project to be out of regulatory compliance. The removal of these minor items from the verification review process would improve verification efficiency and save costs. In addition, we also view this issue as one where there will be numerous requests by verifiers for guidance to OPRs and ARB if no clarifications are issued beforehand. *(RCE-1)*

Comment: As stated in chapter 3.8: Regulatory Compliance (also noted in § 95985(c)(2) of the Regulation): "The compliance with laws provisions depend on

ambiguous, inconsistent and overly broad definitions of offset project activities and violations as they potentially apply to activities that are unrelated to the Forest Project. They are also unclear regarding what constitutes a violation. Finally, the provision to exclude all offsets from an entire reporting period as a result of a noncompliance event at an isolated time within such reporting period is unreasonable." Proposed resolution: "Modify requirement: (1) to be consistent and clear as to what specific activities are or are not part of the offset project activity, and that only violations of Forest Project activities designed to increase removals of CO2 from the atmosphere in the Forest Area as defined in Section 1.1 of the Protocol are eligible to give rise to invalidation. (2) clarify that only fully adjudicated violations that directly affect the number of credits issued from the Project would give rise to invalidation and that simple citations would not be a sufficient basis for invalidating credits issued". *(BLUESOURCE-1)*

Comment: Sections 95973(b) of the Cap and Trade Regulations specifies that compliance with environmental, health and safety laws and regulations is only relevant to the extent such laws and regulations directly apply to the offset project. Section 95985(c)(2) also specifies that ARB may invalidate offset credits for noncompliance with laws to the extent such noncompliance pertains to the offset project activity and implementation of the offset project. While these provisions are clear, the underlying definitions of "offset project" and "offset project boundary" are ambiguous and overly broad as they potentially apply to activities that are unrelated to a forest carbon project. It is also unclear what constitutes a violation, and it is extremely important to ensure that violations not related to the actual offset project activities will not be grounds for invalidation.

Additionally, Section 95973(b) states that offset credits from an entire reporting are not eligible for issuance if the offset project was out of compliance during the reporting period. For many offset project types with typical reporting periods spanning long periods of time, it seems inappropriate to penalize an entire reporting period (perhaps 1 year of offsets) for a violation that may have been incurred and rectified within a matter of days.

The ambiguity of the regulations as described above makes it extremely difficult for market participants to establish the probability and magnitude of risks related to compliance with laws requirements. If offsets are to continue to play a role in California's landmark AB32 Cap and Trade program, it is critical that more specificity and clear boundaries on offset project activities and timing of violations be provided.

Proposed Solution

The Protocol and the Regulations should be modified to clarify that the only activities in the Project Area designed to increase removals of CO2 from the atmosphere or reduce or prevent emissions of CO2 would give rise to an invalidation. Violations

that occur on the Project Area related to, for example, harvesting activity and equipment, snowmobiling, hiking, birding, migratory pathways, hunting, etc. would not give rise to an invalidation as they are not activities designed to increase removals of CO2 emissions or prevent CO2 emissions.

Further, the Protocol should clarify that only fully adjudicated violations that directly affect the number of credits issued from the Project would give rise to invalidation and that simple citations would not be a sufficient basis for invalidating credits issued.

Finally, clarification should be provided specifying that only credits arising during the period of the actual violation could be subject to invalidation rather than all credits arising during the entire Reporting Period. Forest carbon projects are particularly susceptible to this reality, as a majority of the credits from a Forest Project may be issued in the first Reporting Period and, in the instance of a violation occurring inside this initial reporting period, invalidating all of the credits for a one-day or one-time violation would be unreasonable. *(CAR-1)*

> **Response:** Comments related to offset invalidation and regulatory compliance are outside the scope of this rulemaking process. However, ARB posted a guidance document in February 2015 entitled "California Air Resources Board Offset Credit Regulatory Conformance and Invalidation Guidance" to provide further clarity on regulatory conformance requirements and the scope of activities that are subject to review for each specific project type. ARB staff will continue to discuss these concerns with stakeholders that remain unsure of what constitutes regulatory conformance and which activities and violations may subject the project to the invalidation provisions of the Regulation.
>
> The document is available here: http://www.arb.ca.gov/cc/capandtrade/offsets/arboc_guide_regul_conform_invalidation.pdf
>
> If project developers or other interested parties have questions related to a specific project, they should contact ARB staff.

D-1.2. Multiple Comments: Thank you for your continued leadership and commitment to develop a cap-and-trade program in California. As you well know, this program is a central element of California's Global Warming Solutions Act (AB 32) and a well-functioning offset program is a critical cost containment mechanism for the refineries, power plants, industrial facilities, and transportation fuels that are subject to the GHG emissions cap. We, the undersigned, represent the majority of companies located in California, as well as across the nation, that develop and provide support services to offset projects under the ARB Mine Methane Capture

(MMC) protocol. We are concerned that offset supply is constrained due to a lack of clarity in whether carbon offset projects meet the regulatory compliance requirements of the regulation, as this ambiguity renders the risk of invalidation unquantifiable and unmanageable. The recent final determination in the Clean Harbors offset invalidation investigation has introduced a great deal of uncertainty to the market as to how regulatory compliance will be applied to all project types, especially those that are required to have subsequent 12-month reporting periods. There have been multiple articles written to date citing the particular risks associated with MMC projects due to the number of mine citations and violations in any given year (i.e. over 200,000 issued across the country by the Mine Safety and Health Administration in 2012).

All US mining operators are challenged to comply with hundreds of regulatory standards each year. Under these conditions, even the most dedicated and responsible mine operators will frequently be cited for violations of one standard or another. As such, the MMC protocol will be unworkable unless specific guidance is presented by ARB to inform developers, investors, verifiers, and the broader market as to what standard or criteria will be used to determine regulatory compliance. The uncertainty associated with these perceived risks is preventing project development, discouraging capital investment, and negatively impacting the price of MMC offsets. We recommend that ARB include specific clarifications in the MMC protocol, the regulation and ARB guidance documents to address these issues. Our recommended clarifications are the following:

- Direct Applicability: ARB's clarification that the regulatory compliance requirement applies specifically to an offset project and definition of what activities constitute "the project," would greatly diminish the universe of possible compliance issues that would lead to offset invalidation. A straightforward way to do this would be to require the project operator to demonstrate that any event which caused a regulatory non-compliance would have occurred in the absence of the offset project. This could be accomplished by using an "entity approach" in combination with an "activity approach."
    - Many projects will operate under separate legal status from the mine and will need to obtain permits independent of mine operations. The "entity approach" would be to state that a violation would only trigger an invalidation proceeding as a result of a violation issued under a permit that applies to the project, not the mine.
    - Because there are cases where the project does not operate under separate legal status from the mine, the "activity approach" could also be used by explicitly including or excluding certain activities within the definitions of offset project activity or violation, which would clarify what

violations would or would not be grounds for invalidation. As a start, pages 23-32 of the MMC protocol already provide the offset project boundaries and therefore indicate what activities directly impact the offsets themselves. While the activities on pages 23-32 are not a perfect corollary, they could provide grounds to delineate more robust "activity approach" boundaries for direct applicability.

- Timing of a Violation: A one-day violation that is immediately cured, for example, should not result in loss of all credits from an entire 12-month reporting period. Only the portion of credits generated during the violation period should be subject to invalidation for project types which are required to have subsequent 12-month reporting periods. This will likely require a small regulatory amendment to Section 95973(b) during a 15-day change package. Section 95973(b) states that an offset project is not eligible to receive ARB or registry offset credits for GHG reductions or GHG removal enhancements *for the entire Reporting Period* if the offset project is not in compliance with regulatory requirements directly applicable to the offset project during the Reporting Period. The potential loss of emission reduction credits for an entire reporting period is punitive and disproportionate to the severity of many violations, particularly those that occur over discrete time periods.
- Defining a Violation: Any violation should be substantive and directly associated with the offset project activity (i.e. restroom cleanliness should not trigger an invalidation investigation). ARB could acknowledge this by stating in guidance that prior to an invalidation investigation, ARB will conduct an evaluation of the severity of a violation and the subsequent enforcement action that was issued.
- Paper Violations: Certain citations or violations can be issued for an operator's plan failing to conform to applicable laws, even when no action that would break a law has occurred. This "paper violation" only involves paperwork, plans, and anticipated actions as opposed to actions that have already occurred (one example of a "paper violation" is a missed deadline for submission of regulatory documents). Such violations should not be grounds for invalidation since no violating action has in fact occurred. This could be addressed in a number of ways, but a simple way could be to specify that citations or violations that are not the result of actual operation or physical activity may not be grounds for invalidation.

We believe these clarifications on regulatory compliance will provide the certainty needed by carbon offset suppliers and buyers to invest in environmentally beneficial MMC projects. Conversely, without ARB providing more guidance on regulatory compliance, we fear that unmanageable invalidation risk could severely limit financing of good projects, thereby increasing the overall costs of the cap-and trade

program. With additional certainty, more projects can provide increased local and regional air pollution benefits in the sectors of most interest to ARB.

Again, thank you for the opportunity to provide our recommendations on this vitally important issue. We will follow-up with your office this week in order to set up a meeting to further discuss this with you in more detail. *(CE2-1)*

Comment: Thank you for your continued leadership and commitment to develop a cap-and-trade program in California. As you well know, this program is a central element of California's Global Warming Solutions Act (AB 32) and covers major sources of GHG emissions in the State, such as refineries, power plants, industrial facilities, and transportation fuels. Oxbow Mining, LLC is an interested party as well as a partner in an offset project that has been developed under the ARB Mine Methane Capture (MMC) protocol.

Unfortunately, a lack of clarity in whether carbon offset projects meet the regulatory compliance requirements of the regulation is impacting the supply of offsets to the cap and trade system. The recent final decision of the Clean Harbors investigation has introduced a great deal of uncertainty to the market as to how regulatory compliance will be applied to all project types, especially those that are required to have subsequent 12-month reporting periods. There have been multiple articles written to date citing the particular risks associated with mine projects given their proclivity for citations and violations (i.e. over 200,000 from MSHA in 2012). *(OXM-1)*

Comment: We believe these clarifications will provide more certainty for carbon offset suppliers and buyers to invest in environmentally worthwhile projects and provide more certainty on regulatory compliance. Conversely, without ARB providing more guidance on regulatory compliance, we fear less financing will be invested in good projects, which could increase the overall costs of the cap-and- trade program. With more certainty, more projects can provide local and regional air pollution benefits in the sectors of most interest to ARB. The end goal of the regulations should be to create an environment conducive to projects which eliminate or reduce the amount of GHG emissions.

Again, thank you again for the opportunity to provide you with our recommendations on this vitally important issue. *(OXM-1)*

Comment: Thank you for your continued leadership and commitment to develop a cap-and-trade program in California. As this program is a central element of California's Global Warming Solutions Act (AB 32) and covers major sources of GHG emissions in the State, such as refineries, power plants, industrial facilities, and transportation fuels. We think this program is the most progressive in USA. One unique characteristic of this program is that it provides focus and financial resources

to directly reducing greenhouse gas emissions. Our interest is in the ARB Mine Methane Capture (MMC) protocol. We currently capture Mine Methane in 3 states and the protocol can enable us to obtain financial resources to capture mine methane at a rate in excess of what we could do otherwise.

Unfortunately, a lack of clarity in whether carbon offset projects meet the regulatory compliance requirements of the regulation is impacting the supply of offsets to the cap and trade system. The recent final decision of the Clean Harbors investigation has introduced a great deal of uncertainty to the market as to how regulatory compliance will be applied to all project types, especially those that are required to have subsequent 12-month reporting periods. There have been multiple articles written to date citing the particular risks associated with mine projects given their proclivity for citations and violations (i.e. over 200,000 from MSHA in 2012).

We signed a group letter and provide this additional letter with anecdotal information to provide some real life example of citations that we believe should not be considered as causes for invalidation.

All US mining operators and project developers are challenged to comply with hundreds of regulatory standards each year. "Authority to issue citations for violations of their regulations" is just about every Federal, State and County agency in each location we operate. It would be a long list! Typically the major players are:

State level:

- reclamation, mining, safety
- water quality control
- air pollution control
- hazardous materials and waste management
- Oil and Gas Commisions

Federal level:

- EPA has oversite authority of respective State programs
- Office of Surface Mining, Reclamation and Enforcement has oversite authority over the respective State programs
- The United States Forest Service and Bureau of Land Management could also issue citations for activities on lands under their management.

Local:

- Counties

Townships

Water Sheds

A practical reality is that MMC is so new that permits from the above listed agencies are delayed as their regulations were not written with MMC in mind. For example we have facilities that have dual permits required from oil and gas regulations (for the methane gas) and Mine Safety and Reclamation agency (for the methane gas from a mine).

States are different in their perspective on permits. Some states encourage greenhouse gas reduction projects and will expedite permits or correct inappropriate classifications for some. Other states give no preferential consideration to a greenhouse gas reduction project.

Under these conditions, even the most dedicated and responsible project developers as well as mine operators will frequently be cited for violations of one standard or another. As such, the MMC protocol will be unworkable unless specific guidance is presented to inform developers, investors, verifiers, and the broader market as to what standard or criteria will be used to determine regulatory compliance. Citations from any of these agencies are a violation of some rule, some may be trivial, but they are still regulations.

We should really stress that a violation that has nothing to do with the destruction of the methane and carbon offset should not trigger an invalidation. Only a violation that is knowingly committed in an attempt to deceive or manipulate the carbon offsets should be considered. Many of the violations received are very similar to getting a traffic ticket for having a taillight out on your car. You may have been completely unaware of the condition. In fact, the car may have passed a safety inspection the day before the ticket!! A sample of citations that are not relevant in our view to MMC invalidation would be:

Cleanliness of facilities

Periodic certification of fire extinguishers

Wearing of eye, ear, foot protection

Chocks behind the wheels of parked vehicles

Nitrous Oxide Permissions

Decibels of sound

Etc.

Violations are enforced by the relevant agencies and we recommend ARB not be involved in those agencies actions. Most violations are issued and are not final. The burden of proof is often on the Agency. The operator has the right to contest any violation written. The mere issuance of a citation is not the admission or the settlement of such. Often citations are simply orders to fix a condition within a certain time.

The operator has the right to take any and all citations to court. Many violations are settled before going to court, because of the cost. There are established venues for these citations to be handled.

We are frequently asked to describe the risks associated with our projects, especially the regulatory risks. Many financial investors do not want to assume any liability.

The uncertainty associated with these perceived risks are preventing project development, discouraging capital investment, and negatively impacting the price of MMC offsets. We recommend that ARB include specific clarifications in the MMC protocol that would be helpful to address these issues. Our recommended clarifications are the following:

- Direct Applicability: If ARB could clarify that the regulatory compliance requirement applies specifically to an offset project and what activities constitute "the project," the universe of possible compliance issues is greatly diminished. This could be accomplished by using an "entity approach" in combination with an "activity approach."
    - Many projects will operate under separate legal status from the mine and will need to obtain permits independent of mine operations. The "entity approach" would be to state that a violation would only trigger an invalidation proceeding as a result of a violation issued under a permit that applies to the project, not the mine.
    - Because there are cases where the project does not operate under separate legal status from the mine, the "activity approach" could also be used by explicitly including or excluding certain activities within the definitions of offset project activity or violation. A line could be drawn as to what violations would or would not be grounds for invalidation. As a starting place, pages 23-32 of the protocol already show what activities directly impact the offsets themselves. While the activities on pages 23-32 are not a perfect corollary, they could provide grounds to delineate more robust "activity approach" boundaries for direct applicability.
- Timing of a Violation: A one-day violation that is immediately cured, for example, should not result in loss of all credits from an entire 12-month reporting period. While there is some logic to the notion that an ODS violation

would apply to the entire reporting period, which are typically much shorter, it is not a rational approach for all project types. Only the portion of credits generated during the violation period should be subject to invalidation for project types which are required to have subsequent 12-month reporting periods. This will likely require a small regulatory amendment to Section 95973(b) during a 15-day change package.

- Defining a Violation: Any violation should be substantive and associated with the project (i.e. restroom cleanliness should not trigger an invalidation investigation). ARB could acknowledge this by stating that prior to an invalidation investigation, ARB will conduct an evaluation of the severity of a violation and the subsequent enforcement action that was issued. Here again, a presentation of items that would not trigger invalidation proceedings, based on violations commonly received by mines, would be very helpful for project participants. Defining a Violation: Any violation that would trigger an invalidation proceeding should be substantive and associated with the project (i.e. restroom cleanliness should not trigger an invalidation investigation). ARB could acknowledge this by stating that prior to an invalidation investigation, ARB will conduct an evaluation of the severity of a violation and the subsequent enforcement action that was issued. Before a citation would trigger an invalidation proceeding, it should be a violation that is in its final settlement is written as "reckless disregard" and is a vi lotion that was knowingly and willful as a result of the operator of the project that directly affects the carbon offsets. Here again, a presentation of items that would not trigger invalidation proceedings, based on violations commonly received by mines, would be very helpful for project participants.
- Paper Violations: Certain citations or violations can be issued for an operator's plan failing to conform to applicable laws, even when no action that would break a law has occurred. This "paper violation" only involves paperwork, plans, and anticipated actions as opposed to actions that have already occurred. Such violations should not be grounds for invalidation since no violating action has in fact occurred. This could be addressed in a number of ways, but a simple way could be to specify that citations or violations that are not the result of actual operation or physical activity may not be grounds for invalidation.

We believe these clarifications will provide more certainty for carbon offset suppliers and buyers to invest in environmentally worthwhile projects and provide more certainty on regulatory compliance. Conversely, without ARB providing more guidance on regulatory compliance, we fear less financing will be invested in good projects, which could increase the overall costs of the cap-and trade program. With more certainty, more projects can provide more local and regional air pollution benefits in the sectors of most interest to ARB.

Again, thank you again for the opportunity to provide you with our recommendations on this vitally important issue. We will follow-up with your office this week in order to set up a meeting to further discuss this with you in more detail. *(VCG-1)*

Comment: Hi. My name is Josh Strauss. I'm the Director of Forest Projects for Blue Source.

But today I'm here to speak on behalf of the International Emissions Trading Association, IETA. IETA, a multi-sector group of over 140 businesses across California and globally is increasingly concerned about program and market impacts linked to ambiguous and inconsistent compliance language in the regulation and offset protocols. IETA fully supports ARB's effort to ensure that offsets are generated in full compliance with relevant regulations.

The recent Clean Harbors ODS investigation and determination brought to light a lack of clarity regarding several aspects of whether or not California offset projects sufficiently meet regulatory compliance requirements under California's regulation. This uncertainty makes it extremely difficult for market participants to establish the probability and magnitude of risks related to compliance with laws requirements.

If offsets are to continue to play an important cost containment role in California's program, it is critical that more specific language and clear boundaries on offset project activities and violation time lines be provided. IETA has made the following specific suggestions on how to clarify the applicability regulation language to enable investments in the projects needed to make California's program a success. First, IETA recommends that the regulation and revised protocols clarify that only activities in the offset project area designated to increase removals of greenhouse gas emissions from the atmosphere or reduce/prevent emissions could potentially lead to an in validation.

Second, it remains unclear what exactly constitutes a violation. IETA believes it is extremely important to ensure that violations unrelated to actual offset project activities are not grounds for invalidation. Protocol language should therefore clarify only fully adjudicated violations which directly affect a number of credits issued from a project can result in potential invalidation.

Finally, IETA asked the ARB to provide clarification specifying that only credits arising during the period of an actual violation could potentially be subjected to invalidation rather than all credits arising during an entire reporting period.

Thank you for your time today and for this opportunity to comment. *(IETA-2)*

> **Response:** Comments related to offset invalidation and regulatory compliance are outside the scope of this rulemaking process. However, ARB posted a guidance document in February 2015 entitled “California Air

Resources Board Offset Credit Regulatory Conformance and Invalidation Guidance" to provide further clarity on regulatory conformance requirements and the scope of activities that are subject to review for each specific project type.

The document is available on the Compliance Offset Program webpage: http://www.arb.ca.gov/cc/capandtrade/offsets/arboc_guide_regul_conform_invalidation.pdf

While offset supply is an important factor, assuring that all ARB offsets represent real, permanent, quantifiable, verifiable, enforceable, and additional GHG emission reductions and GHG removal enhancements is also important. ARB has also taken several steps to address offset supply concerns. In addition to the four originally approved protocols in 2011, ARB has added a MMC Protocol. This rulemaking proposes to add a Rice Protocol, and extend the geographic scope of the current Forestry Protocol to include Alaska. ARB staff will continue to evaluate and propose new offset protocols that will generate compliance offset credits that meet AB 32 criteria. It is also important to note that there is no indication that all possible projects have been implemented under the existing protocols. Offset projects are price responsive. If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, project developers will respond by undertaking more projects with the expectation of higher returns on investment.

E. COMMENTS UNRELATED TO THE PROPOSED AMENDMENTS

E-1. Opposition to Offsets

E-1.1. Comment: On behalf of Food & Water Watch (FWW), a national advocacy organization headquartered in Washington, DC, and our approximately 100,000 members, supporters and activists in California, I write to express our opposition to the Proposed Amendments to Sections 95802, 95973, 95975, 95976, 95981, 95985, and 95990, title 17, California Code of Regulations (CCR) under consideration for the December 18, 2014 public hearing. This comment specifically addresses the issue of offsets — the proposed Rice Cultivation Compliance Offsets, as well as the proposed updates to the U.S. Forest Compliance Offset Protocol.

In theory, pollution trading programs, like the rice and forest offsets, generally exist for two reasons. First, to allow purchasers of credits who are subject to technological mandates on emission controls, in this case industrial greenhouse gas (GHG)

emitters, to evade the cost of those controls; and second, to create financial incentives for other industrial polluters, in this case rice operations, to do what they should be doing anyways to reduce their own contribution to the problem.

This is a misguided plan for many reasons, but some of the biggest issues are that it destroys one of the most important aspects of our modern environmental and public protection framework — one that has mostly kept our waterways from being open sewers and our airways mostly breathable — and that is a technology-driving approach that challenges industries to invent and implement better systems to reduce pollution discharges to the bare minimum. This was one of the worst outcomes of the failed 1990's LA air trading programs (RECLAIM and Rule 1610) — it de-incentivized technological advances in the credit-purchasing industrial sector.

Another major shortcoming of trading, on the credit generating side, is that it allows our political leaders, who lack the courage and will to properly regulate highly-polluting industries like agriculture, to continue to avoid doing what needs to be done, and that is to place mandatory controls on all sources of pollution. Here, if rice farms can implement Best Management Practices like dry seeding and early drainage to reduce methane emissions, than why should they be able to profit from doing what, under any responsible regulatory regime, should be mandated by the state? If the state were really serious about reducing GHG emissions, then voluntary compliance would not be an option. Voluntary compliance has proven, time and again, to be a failed approach that only ensures ongoing problems and net increases of pollution.

Any kind of offset is a legitimate threat to achieving real, additional, or permanent emissions reductions. They allow polluters to avoid the urgent need to stop polluting and instead pay to continue polluting with impunity, while claiming that emissions have been reduced elsewhere.

A close look at the proposed rice cultivation offsets and the amendments to the forest offset protocol shows glaring problems. When considering the fact that methane emissions from rice cultivation only represent 0.1% of total GHG emissions in the United States, this confounds the purpose of offsets and initiatives to reduce GHGs — namely, to significantly reduce emissions. Targeting a process that results in minimal emissions and will only allow minimal reductions, exposes this proposed offset for what it really is — a way to add more offset credits to the market regardless of whether they will create legitimate or significant reductions. In fact, California has been increasingly determined to add as many offsets as possible no matter how plausible, even under the best scenario, reductions may be.

Moreover, the agenda behind offsets, as is clear here, too often places priority on cost containment, market efficiency and making it easier for polluters to comply,

disregarding the true priority of reducing GHG emissions. California has its priorities all wrong.

The issue of permanence presents the most egregious problem from offsets, especially the proposed rice cultivation offsets and existing forest offset protocol. The dictionary defines permanence as “the state or quality of lasting or remaining unchanged indefinitely.” However, the Air Resources Board’s understanding of permanence is quite distorted in stating that “Permanent means, in the context of offset credits, either that GHG reductions and GHG removal enhancements are not reversible, or when GHG reductions and GHG removal enhancements may be reversible, that mechanisms are in place to replace any reversed GHG emission reductions and GHG removal enhancements to ensure that all credited reductions endure for at least 100 years.”

This sends the contradictory message that offset protocols require permanence, but then allows for situations where permanence can be violated so long as there are back up mechanisms in place. For example, the Forest Buffer Account exists for use when a forest used for offsets might burn down or be destroyed by another natural disaster, reversing the offsets generated. However, what’s left unsaid is that using a buffer account like this allows the total amount of emissions released to increase — the reversed offsets release emissions, requiring more offsets to replace those reversed, ultimately increasing the aggregate number of credits used and subsequently increasing the overall amount of emissions allowed. It’s not as simple as a one-for-one exchange.

Additionally, offsets conflict with the requirement for permanence when the life of the reductions is only for 100 years, instead of achieving true permanence. Crediting periods also contradict the concept of permanence when they only go for 25 or 30 years at a time. This is, again, not permanent. It is also unclear what happens after the crediting periods end, or after the 100 years of “permanence” end. The companies that issue the offset credits might not exist in 25, 30 or 100 years, and these impermanent crediting periods bring all of the offsets issued into question. The entire structure of these offsets presents a significant risk of large-scale reversal in the future, undoing whatever emissions reductions might happen and creating no real progress on the very critical issue of GHG reductions.

The threats posed by climate change to our public health, environmental health, communities and livelihoods are permanent and real, and so must our efforts to stop these threats be permanent and real — offsets cannot accomplish this. The fact that they require loopholes, distortions and exceptions to even “work” shows that offsets are not a solution, but merely a scam.

Another problem arises in the methodology for measuring the amounts of carbon dioxide (CO2) stored in forests and as well as the methods for calculating emissions

reductions from the proposed rice cultivation offsets. Although both methodologies are problematic, they share a significant issue in that they use models and estimates to arrive at the amount of CO2 stored in a forest or the amount of methane emissions prevented from different rice cultivation practices. From these estimates, offsets are then sold for exact amounts of avoided emissions. A modeled estimate does not equal an exact amount of emissions. It doesn't add up. *(FWW-1)*

> **Response:** The comment concerning rice cultivation GHG reductions in the context of reducing GHG emissions is addressed in ARB staff's response to Comment B-8.12. The comment regarding use of a model to quantify methane emissions for rice cultivation projects is addressed in ARB staff's response to Comment B-3.18.
>
> The remainder of this comment is outside the scope of this rulemaking process, therefore no response is required.

E-2. Reporting Period

E-2.1. Comment: As stated in section 95802. Definitions (334): "The requirement that first Reporting Period must cover at least span 6 months causes an unnecessary delay in credit and revenue generation that is often needed to pay back initial project expenses, creating a barrier to entry. This requirement does not enhance the overall program in any manner". Proposed amendment, "Eliminate this requirement." *(BLUESOURCE-1)*

> **Response:** This comment is directed at a section of the Regulation that was not proposed for amendment and is outside the scope of this rulemaking process, therefore no response is required.

E-3. Mine Methane Capture Offset Protocol

E-3.1. Comment: Thank you, Chair Nichols and the Board and staff for inviting me and giving me an opportunity to testify today on the Mine Methane Capture protocol.

For one, I think -- and I've told my friends and associates, I think your Cap and Trade Program is best in the world. I don't -- I'm not acquainted with all of them. But one reason I'm impressed with it is focused on the direct activity of greenhouse gas reduction.

My focus is on mine methane capture in that field, and I'm here just to suggest that the staff work on clarifying some of the issues. And we've got the car now. We have mine methane capture. Now we're driving it. And so we're getting some experience

with some of the issues we'd like to see clarified particularly with regard to invalidation and the validation regarding citations of violations, for instance.

I wrote -- I did turn in a letter for me personally about just some anecdotal citations which I don't think would be appropriate to be considered as invalidating offsets. For instance, you have the requirement sometimes from different regulatory agencies for the same facility. And so times you have to actually work out an agreement between who's on, who's off. A well could be regulated by the oil and gas industry because it's -- gas is coming out of the well. And the mining regulatory authorities could still regulate it because methane coming out of a mine.

Simple citations could include removing the requirement to remove a hazard that's in a walkway or pathway. Somebody could trip or stumble over. So you should fix that or you get a citation for it. You get a citation for not having put a chalk behind the tire of the truck or vehicle to keep it from rolling backwards. Cleanliness, permitted noise levels in certain areas. Of course, wearing safety gear, gloves, ear protection, eye protection, et cetera. Those are just a number. And they are regularly being cited, and there's numerous agencies that can send in a citation. But that also you want to have the right to that citation is just a citation. We can challenge it. So we don't think it's appropriate to have the offsets invalidated while we maybe have right of due process to challenge it. And then also a lot of these citations are simply an inspector coming by, the mine safety health administration officials saying, "Fix this." Well, okay. So fix it. And so is that my three minutes. *(VCG-2)*

> **Response:** This comment is outside the scope of this rulemaking process, therefore no response is required, however, staff will continue to evaluate the implementation of the MMC Protocol and propose amendments if necessary.

V. SUMMARY OF COMMENTS MADE DURING THE 15-DAY COMMENT PERIOD AND AGENCY RESPONSES

Chapter V of this FSOR contains all comments submitted during the 15-day comment period for the proposed amendments. The 15-day comment period commenced on May 20, 2015 and ended on June 4, 2015.

ARB received 35 comment letters on the proposed amendments during the 15-day comment period. In addition, 26 commenters gave oral testimony during the December 2014 Board hearing. Similar to Chapter IV of this FSOR, comments are categorized into one of 4 sections below, and are grouped for response wherever possible.

Table V-1 below lists commenters that submitted oral and written comments on the proposed amendments during the 15-day comment period, identifies the date and form of their comments, and shows the abbreviation assigned to each.

A. LIST OF COMMENTERS

Abbreviation	Commenter
ACR-3	John Kadyszewski, American Carbon Registry Written Testimony: 6/4/2015
ACR-4	Lauren Nichols, American Carbon Registry Written Testimony: 6/4/2015
ACR-5	Arjun Patney, American Carbon Registry Oral Testimony: 6/25/2015
BLUESOURCE-4	Roger Williams, Blue Source Oral Testimony: 6/25/2015
BLUESOURCE-5	Roger Williams, Blue Source, LLC Written Testimony: 6/3/2015
BML-1	Richard Saines, Baker & McKenzie LLP Written Testimony: 6/3/2015
BPAI-1	Ralph Moran, BP America Inc. Written Testimony: 6/4/2015
BPAI-2	Ralph Moran, BP Oral Testimony: 6/25/15
CAC-2	David Phillips, Chugach Alaska Corporation Written Testimony: 6/4/2015
CAC-3	Jim Boyd, Chugach Alaska Corporation Oral Testimony: 6/25/2015
CAGG-2	Debbie Reed, C-AGG Written Testimony: 6/4/2015
CAR-2	Gary Gero, Climate Action Reserve Written Testimony: 6/3/2015
CAR-3	John Nickerson, Climate Action Reserve Oral Testimony: 6/25/2015
CBD-1	Brian Nowicki, Center for Biological Diversity

	Written Testimony: 6/4/2015
CBD-2	Brian Nowicki, Center for Biological Diversity Written Testimony: 6/4/2015
CC-1	Todd Shuman, Concerned Citizen Written Testimony: 6/3/2015
CCEEB-1	Gerald Secundy, California Council for Environmental and Economic Balance Written Testimony: 6/4/2015
CCEEB-2	Mikhael Skvarla, CCEEB Oral Testimony: 6/25/2015
CDFA-1	Jenny Lester Moffitt, California Department of Food and Agriculture Oral Testimony: 6/25/2015
CE2-3	Claire Van Zuiden, CE2 Carbon Capital Oral Testimony: 6/25/2015
CFA-3	Steve Brink, California Forestry Association Written Testimony: 6/4/2015
CFA-4	Steve Brink, California Forestry Association Oral Testimony: 6/25/2015
CHEV-1	Julia Bussey, Chevron Corporation Oral Testimony: 6/25/2015
CRC-3	Paul Buttner, California Rice Commission Written Testimony: 6/4/2015
CRC-4	Paul Buttner, California Rice Commission Oral Testimony: 6/25/2015
ECOP-2	Kyle Holland, ecoPartners Written Testimony: 6/4/2015
ECOP-3	Zach Barbane, ecoPartners, LLC Oral Testimony: 6/25/2015
EDF-3	Robert Parkhurst, Environmental Defense Fund Written Testimony: 6/4/2015
EDF-4	Robert Parkhurst, Environmental Defense Fund Oral Testimony: 6/25/15
EDF-5	Robert Parkhurst, EDF Written Testimony: 6/26/2015
ESI-2	Jonathan Pomp, Environmental Services Inc. Written Testimony: 6/4/2015
FCC-3	Sean Carney, Finite Carbon Corporation Written Testimony: 6/4/2015
FCC-4	Sean Carney, Finite Carbon Oral Testimony: 6/25/2015
GDRC-3	Gary Rynearson, Green Diamond Resource Co. Written Testimony: 6/4/2015
GDRC-4	Gary Rynearson, Green Diamond Resource Company Oral Testimony: 6/25/2015
IETA-2	Kate Sullivan, IETA Written Testimony: 6/4/2015

IETA-3	Joshua Strauss, IETA Oral Testimony: 6/25/2015
NFI-3	Emily Warms, New Forests Inc. Written Testimony: 6/4/2015
NFI-4	Timothy Robards, New Forests Oral Testimony: 6/25/2015
PFT-2	Constance Best, Pacific Forest Trust Written Testimony: 6/3/2015
PFT-3	Constance Best, Pacific Forest Trust Written Testimony: 6/4/2015
PFT-4	Connie Best, Pacific Forest Trust Oral Testimony: 6/25/2015
PGE-3	Claire Halbrook, Pacific Gas & Electric Oral Testimony: 6/25/2015
RCE-2	Peter Browning, Ruby Canyon Engineering, Inc. Written Testimony: 6/4/2015
SCS-3	Christie Pollet-Young, SCS Global Services Written Testimony: 6/4/2015
SCS-4	Robert Hrubes, SCS Global Services Oral Testimony: 6/25/2015
SEA-1	Brian Kleinhenz, Sealaska Corporation Oral Testimony: 6/25/2015
SEA-2	Brian Kleinhenz, Sealaska Corporation Written Testimony: 6/26/2015
SF-1	Ara Marderosian, Sequoia Forestkeeper Written Testimony: 6/3/2015
SIGLLC-2	Gary Gero, Spatial Informatics Group Written Testimony: 6/4/2015
SIGLLC-3	Paul Lilly, Spatial Informatics Group Oral Testimony: 6/25/2015
SPI-3	Edward Murphy, Sierra Pacific Industries Written Testimony: 6/4/2015
SPI-4	Edmund C. Murphy, Sierra Pacific Industry Oral Testimony: 6/25/2015
STAN-2	Aaron Strong, Stanford University Written Testimony: 6/4/2015
TCT-1	Mik McKee, The Climate Trust Written Testimony: 6/4/2015
TCT-2	Mik McKee, The Climate Trust Oral Testimony: 6/25/2015
TGC-2	Sharhira Esmail, Terra Global Capital, LLC Written Testimony: 6/4/2015
TGC-3	Sharhira Esmail, Terra Global Capital, LLC Written Testimony: 6/4/2015
TNC-3	Alexander Leumer, The Nature Conservancy Written Testimony: 6/4/2015
TNC-4	Michelle Passero, The Nature Conservancy

	Oral Testimony: 6/25/2015
WSPA-1	Michael Wang, Wester States Petroleum Association Written Testimony: 6/4/2015
WSPA-2	Michael Wang, Western States Petroleum Associations Oral Testimony: 6/25/2015

B. COMPLIANCE OFFSET PROTOCOL RICE CULTIVATION PROJECTS

B-1. General Support

B-1.1. Multiple Comments: The Climate Action Reserve is very supportive of the California Air Resources Board's (ARB) efforts to develop and approve new offset protocols for use in California's cap and trade program. In particular, the Reserve commends ARB staff on the extensive and rigorous effort that has gone into the development of the new Rice Cultivation Compliance Offset Protocol, and we urge ARB to adopt it.

The Reserve developed and adopted our own Rice Cultivation protocol in 2011 through our rigorous and transparent stakeholder-driven development process. We are pleased that ARB was able to build from and expand upon our voluntary protocol, and that it helped to inform the compliance protocol development process. The Reserve has been an active participant in ARB's technical working group for this protocol since it was convened in April 2013, where we have shared experience, insights, rationale, and resources from our protocol development process. The Reserve appreciates how ARB staff has actively engaged with stakeholders throughout ARB's own process, attempting to address and mitigate the concerns of the Reserve and of other stakeholders as they arose.

We are confident that the project activities and quantification methodologies contained within the Rice Cultivation Compliance Offset Protocol will provide regulatory-quality offsets for California that meet the regulation's requirements to be real, additional, quantifiable, permanent, verifiable, and enforceable. We encourage ARB to adopt this protocol, and look forward to the addition of another compliance offset protocol under California's cap-and-trade regulation. *(CAR-2)*

Comment: ARB's Compliance Offset Protocol for Rice Cultivation Offset Projects ("Rice Protocol") provide important precedents for future California agricultural offset protocols, such as the Nutrient Management Protocol. IETA generally supports the progress and noticeable clarifications made to the current Rice Protocol, and we applaud the cooperative spirit in which ARB Staff have worked with a broad range of stakeholders on its development and refinement. *(IETA-2)*

Comment: Offsets are an important part of a well-functioning cap-and-trade program, and serve as a cost-containment mechanism for regulated sectors while achieving beneficial GHG emissions reductions from unregulated sectors. Science-based offset protocols that are designed with the agricultural sector in mind must take into consideration the biological nature of these managed ecosystems and the economic and socio-cultural nature of the agricultural sector. Well-designed, effective offset protocols for the agricultural sector must be flexible enough to allow for variability due to different management practices as well as to changing weather, climate, land tenure and ownership, for instance, while also encouraging innovation, a hallmark of the agricultural sector.

C-AGG applauds the California Air Resources Board's (ARB) commitment to develop agricultural protocols that will engage the agricultural sector in voluntary opportunities to contribute to California's cap-and-trade program and emissions reduction obligations, and ARB's continued engagement with stakeholders. C-AGG believes that the Compliance Offset Protocol: Rice Cultivation Projects will provide important precedents for other agricultural offset protocols developed and approved by ARB in the future. *(CAGG-2)*

Comment: In the current Rice Protocol, ARB requires individual verification statements for every Offset Project Operator (OPO) within a consolidated Offset Project Data Report (OPDR) submitted by a single Authorized Project Designees (APD). We recommend this requirement should be changed to require audits of all OPO data, as collected, managed and stored by APDs, but only site visits on a scientifically identified sample of farms or fields within a collective project[14] . If audits reveal errors or indicate problems that may be systemic, a more in-depth verification should be required.

C-AGG supports science-based verification approaches that utilize randomized and risk-based sampling to allow for site visits on a scientifically identified sample of farms or fields within aggregated projects. Project verifiers already develop Sampling Plans in a transparent and documented approach; C-AGG's proposed approach is fully in keeping with this, and would rely on the rigor of science to reduce verification costs without sacrificing program integrity.

Combined with documentation requirements and monitoring techniques such as the satellite data and other remote sensing technologies, date- and time-stamped photographs, and other real-time and technological approaches that exist and or may be under development or even yet-to-be, these verification approaches can be scientifically and technically rigorous and meet the necessary reasonable level of

[14] See C-AGG's proposed approach recognizing that project verifiers already develop Sampling Plans in a transparent and documented manner - the proposed approach relies on the rigor of science to reduce verification costs without sacrificing program integrity.

assurance without being more costly than potential returns on project investment. *(CAGG-2)*

Comment: The Environmental Defense Fund (EDF) strongly encourages the California Air Resources Board (ARB) to adopt the Rice Cultivation Projects Compliance Offset Protocol (Rice Protocol), released May 20, 2015, at its June 25, 2015 meeting. The adoption of this protocol should not be delayed.

EDF applauds the dedication of ARB staff in developing an offset protocol for rice growers. This protocol has been through an extensive and thorough process, starting with the first workshop in March 2013. Every draft has refined key concepts and reflected feedback from stakeholders. ARB has a long standing reputation for developing informed and scientifically sound policies and regulations; this protocol is no exception. The Rice Protocol is ready for implementation and is a critical step in the generation of offsets from agriculture. This protocol is the logical starting point as rice growers are one of the most progressive industries when it comes to both feeding the world and protecting the environment.

ARB staff has gone to great lengths to ensure the credits generated by the Rice Protocol are real, additional, quantifiable, permanent, verifiable, and enforceable. Furthermore, staff has developed the protocol in a way that virtually eliminates any adverse impacts resulting from the practice in the protocol. Through their process, ARB held five technical working group meetings to discuss key provisions; engaged world renowned wildlife experts to understand and mitigate potential impacts to wildlife; visited farmers in both California and the Midsouth to understand their practices; and applied the latest science to the measurement of methane from rice cultivation.

The ARB has done a significant amount of work to analyze the potential environmental and habitat impacts that could occur due to implementation of the Rice Protocol. We appreciate that the protocol only allows project activities during the rice growing season. We are encouraged by the Staff's research that the Early Drainage practice "could serve as a benefit to giant garter snake populations." Also, we are pleased to see that rice cultivation within the Butte Sink Wildlife Management Area will not be eligible to participate, considering the critical importance of that habitat for waterfowl. *(EDF-3)*

Comment: ACR applauds the hard work and considerable effort of ARB staff in the development of a compliance offset protocol for rice cultivation. The protocol is ready for implementation, and we strongly encourage ARB's immediate adoption of the protocol as a critical step in encouraging emissions reductions from the agriculture sector in California's landmark Cap-and-Trade Program. *(ACR-4)*

Comment: This protocol is significant in that it is the first on-field agricultural offset to be consideration -- in consideration of the Cap-and-Trade Program. California's agricultural sector has an important opportunity to participate in voluntary incentives portion of the Cap-and-Trade Program, and I commend your leadership and your staff's work on this protocol.

Back in 2013, CDFA testified with Edie Chang on the joint legislative hearing of the Assembly Select Committee on Sustainable and Organic Agriculture, and the Assembly Select Committee on Agriculture and the Environment discussing climate change and agricultural issues.

The development of agricultural offsets was one of the topics noted at the hearing. We had just begun the discussion on this rice protocol, and it was not without its challenges. These challenges stem from establishing implementation, reporting, and verification procedures that do not jeopardize the credibility of the program, our State agencies, and those who are working at the ground level to reduce greenhouse gases.

Any protocol proposed at the Board for consideration must have real quantifiable, verifiable, and enforceable metrics as defined by staff, and those who are working on the ground to reduce greenhouse gases.

As you know, agriculture is a dynamic system that requires much flexibility when developing these incentive programs. There was a lot of attention given to establishing the science behind this protocol. A little over two years later, after very useful, intensive, and productive discussions with your staff and stakeholders, most of those challenges of the rice protocol have been addressed.

The result is the first crop-based agricultural offset protocol for your consideration today. These benefits in addition to producing a safe, high quality food source, include efforts to address air quality and reduce greenhouse gases.

This ag offset protocol will provide an incentive to growers in the Sacramento region that grow rice to reduce greenhouse gases while providing other benefits such as food production and wildlife habitat for birds.

We know that this rice offset protocol will be well received by early innovators in the rice production, and I understand that there will be continued discussions on the eligibility of early action projects. We are in support of this ag offset rice protocol, and believe that collaboration between ARB staff, CDFA, and stakeholders should continue. We also look forward to working with ARB and other commodities and stakeholders to advance further and future offset protocols as well. *(CDFA-1)*

Comment: Chairman Nichols, members of the Board, ARB staff, thank you for the opportunity to speak this afternoon.

Shortly, you'll vote on the rice cultivation project's compliance offset protocol. This is a huge milestone. It will be the first crop-based protocol approved for use in any Cap-and Trade Program. It is a gateway to other protocols from agriculture, and it addresses many of the critical criteria necessary for those protocols, including the use of biogeochemical models such as DNDC and consolidated reporting.

ARB staff put forth extraordinary effort in this protocol as was evidenced in their presentation. They conducted four working group meetings, visited farms in California and Arkansas and met with world renowned experts. Their work should be commend.

This milestone would not have been possible without the partnership of a number of organizations, particularly the California Rice Commission, the White River Irrigation District in the mid-south, as well as funding from USGA, NRCS through two conservation innovation grants.

Speaking of the mid-south, I have a letter today from our partners supporting the protocol and encouraging you to adopt it, and you should have it up there with you.

As the largest uncapped sector, agricultural lands offer an unparalleled opportunity for generating greenhouse gas reductions. Agriculture current represents 10 percent of U.S. Greenhouse emissions. However, if we continue with business as usual, the World Bank estimates that agriculture could be responsible for as much as 70 percent of the planet's emissions by 2050.

The approval of the rice protocol opens the door for the development of other agricultural standards what will pay farmers for reducing emissions. With this precedent, the stage is set for a nutrient management protocol to reduce nitrous oxide emissions from fertilizer.

This effort could apply to more than 400 million acres of crop land across the U.S. and contribute millions of tons of greenhouse gas reductions while protecting or even improving farmer's yields. Once approved, it's critical that rice protocol get off to a good start. In particular, the verification is an important issue. Verification of rice projects is currently 50 percent of their total development cost.

I'm pleased that CDFA and ARB are working with stakeholders to find ways to reduce this cost of verification while maintaining a high degree of environmental rigor. As that work continues, you'll see EDF at the table helping to move practical solutions forward. *(EDF-4)*

Comment: IETA looks forward to seeing the rice protocol's adoption as soon as possible. We also encourage staff to explore future opportunities for additional modification in order to heighten the protocol's workability, scalability, and economic viability. *(IETA-3)*

Comment: We ask you today to vote in favor of offset supply, to vote in favor of the rice protocol. *(CHEV-1)*

Comment: And also, the Reserve is very proud of the role that it played in development of the rice protocol and very supportive of its current iteration as it is before you today. And we strongly support the adoption of that protocol. *(CAR-3)*

Comment: The undersigned on this letter represent rice growers and their partners in the Midsouth. We are submitting these comments to urge you to adopt the Rice Cultivation Projects Compliance Offset Protocol at the June 25, 2015 Board meeting. Although there are always questions and issues with anything new, it is time we moved on with these Rice Compliance protocols.

For the past four years, we have been working to develop carbon offset projects for rice grown in the Midsouth. We are active participants in the Natural Resource Conservation Service's Conservation Innovation Grant which created the Voluntary Emission Reductions in Rice Management Systems offset protocol adopted by the American Carbon Registry (ACR) in February of 2014. The science used to develop the Midsouth practices in the ACR protocol and this proposed ARB protocol was conducted with our growers.

We listed the first Midsouth rice cultivation offset project, ACR230, with ACR on December 29, 2014. The project includes 8 participating farmers, with 63 unique fields on 3,000 acres in Arkansas and Mississippi. The voluntary management practices that will be undertaken by farmers in this project include: early drainage, intermittent flooding, and increased energy and water use efficiency. For the first vintage of credits we have already secured a buyer, and our plan is to transition the project to a California cap-and-trade voluntary Early Action project for the second vintage of credits.

We have also secured two additional grants over the past two years to expand our work to include remote sensors to document implementation of the practices in preparation for verification under the proposed protocol. We understand that CARB and the California Department of Food and Agriculture (CDFA) have secured funds to help cover the costs of verification as a part of a pilot project. We encourage CARB and CDFA to use these funds to promote the piloting of cutting edge remote monitoring technology to strengthen in-field monitoring in addition to covering the cost of verification.

We urge the Board to adopt the protocol at the June 25th meeting so that we can continue and expand our work with rice growers in the Midsouth. The consideration of the rice protocol by the Board has already been postponed twice. A signal from CARB encouraging the implementation of climate smart agriculture is important to growers who have been working on developing and implementing these practices and technologies over the past four years. The Midsouth participating rice growers have worked hard to help identify practices, measurement methods, and record keeping in support of this effort. Further delay will be a significant setback.

Let's move forward. We encourage the Board to pass the Rice Cultivation Project Compliance Offset Protocol at the June 25, 2015 meeting. *(EDF-5)*

> **Response:** ARB thanks the above commenters for their support of the Rice Protocol.

B-2. Early Action Projects

B-2.1 Multiple Comments: We are encouraged by ARB's response to previous comments on ensuring the transition of voluntary credits generated through the application of the ACR rice protocol to those of Early Action offsets with the inclusion of the ACR rice protocol under section 95990 (c)(5)(H) of the Cap-and-Trade regulation amendments. At this time Terra is managing three projects under the ACR Rice Protocol, two from California and one from the Mid-South. In total this represents 21 producers with 253 fields on 22,213 acres who have been actively engaged in applying emission reducing practices on fields beyond the practices of most growers in their regions. They should be recognized as part of the "early voluntary reduction" intent under section 38562 of the AB32 legislation. By ensuring the transition of these voluntary projects into the compliance market, ARB is sending a strong message to farmers on their commitment and resolve to include and treat fairly the agricultural sector in the cap and trade program.

The ACR protocol was developed to ensure rigorous standards for quantification and additionality, but ensured that the early adopters (representing less than 5% of the growers) could participate in the program providing the critical information needed to test, fine tune and understand the environmental and economic impacts of producing these offsets. Thus, for three of the practices this was achieved through the use of a common practice baseline that represents the typical grower's practices as the business as usual case. This baseline methodology is the same as that which is used for the ARB Forestry Protocol. In order to include these early adopter ACR rice offset projects, a common practice baseline exemption must be made for ARB Early Action. Without the ability to use a common practice baseline (i.e. requiring the use of a field specific baseline), early adopters would either 1) not be able to get credit

because their emission reduction practices would be captured in the baseline period since they were testing the practice, or 2) if the project start year was pushed back to when the first started the practice, they could not be able to produce the data required because it was not collected this far back in time. Some would say the growers who were already doing the practice should not get credit, but since these growers represent the forward thinking conservationist representing less than 5% of the growers, they are additional over the vast majority of growers (i.e. common practice). As stated before, this is the same treatment used under the ARB forestry protocol for improved forest management and thus it should be extended to rice.

…We encourage ARB to not go forward with the existing protocol without the ability for the 24 growers using ACR to convert to ARB under early action provisions for qualifying practices, as these are the very growers that will lead the way into making this a viable offset type. *(TGC-2)*

Comment: In my December 15, 2014 letter I wrote:

> "We cannot understate the importance of farmers who try new methods to serve as spokespersons in the tractor dealerships and coffee shops in these farm communities. If allowed to participate, they become the advocates for new methods and the programs that support them. We have had success in our wildlife habitat programs by using these early pioneers to advertise their positive experiences with the Natural Resources Conservation Service, for example, to implement certain beneficial practices. Some new programs tend to eliminate participation by this important group of growers and miss out on the trusted voices they can have in convincing fellow growers to head down a new path. We are very encouraged to see that "early action" is being considered. We are hopeful, however, that the stringency of past recordkeeping rules (not available to them in previous years), will not prevent them from qualifying. Flexibility will be key in this area."

This issue of including early adopters is crucial to me because I will be leading the effort to promote this Rice Protocol to the 2500 growers that CRC represents. My job will be infinitely harder if I don't have at least the small set of four pilot producers that have worked with us for the last several years to help get us where we are today. They will be the growers that I will invite to CRC workshops to promote participation in the program. If they stand up amongst their peers and describe how the process actually worked and that they were issued marketable offsets, I give myself better odds of success. Without these growers, I predict that achieving significant uptake of this Rice Protocol here in California will be tough.

It is my understanding that the current Early Action proposal would require this small set of pilot project growers to have field-specific data going back several years in order to be issued offset credits--data that they could not possibly have known would

be required even though they were performing the practices as far back as 2007. Analysis I've seen indicates that this could eliminate the possibility of the majority of these Early Action offsets being issued even though the total potential credit for these pilot producers is quite small compared to the total reductions called for by AB 32. The offsets would be less than 6,000 tons. ARB needs something like 174 million tons. It can quickly be seen that these 6,000 tons are quite small, representing about 0.003 percent of the 2020 reduction objective.

Specific Recommendation

CRC believes that ARB should find an innovative way to issue this relative small amount of offset credit to these pilot producers with a unique approach that does not penalize them for a lack of sufficient data. Average baseline conditions can easily be ascertained 500,000 acres of rice farming in the Sacramento Valley and used to calculate the final offset credits. More rigid field-specific data requirements can then be used for Rice Protocol participants moving forward who are fully aware of data requirements of the program. *(CRC-3)*

Comment: My name is Paul Buttner with the California Rice Commission. When I was here last December, of course, I was highly supportive of this regulation. At that point in time, I really thought we were going to get to the finish line on a really important issue to me, and that is early action. And I feel like we've fallen short of that, and I'll explain why and why it's so important to me.

Some seven or eight years ago, I started out – I convinced eight of my growers to join me in the pilot scale efforts to really prove out the fact that we could do this. I have four left standing, and three of those four are doing things that actually could -- they're doing the practice as a part of this proposal.

However, the problem with it is one of these pilot scale producers, unfortunately the largest one that I have, doesn't quite have the records -- the pre-207 records that provide the information that have to go into the DNDC model to do a site-specific baseline analyses.

I think you can imagine that this particular grower started these practices in '07 after AB 32 was passed. Certainly, even then, it was impossible to understand exactly what data would be required now in 2015, let alone the three to five years prior to 2007. We know that this producer started these practices then. We simply don't have all the data necessary in the regulation to calculate that baseline.

I now have 15 years of experience of hocking conversation plans to my growers, most of them in the wildlife habitat area. I can tell you without question the absolute most important thing for me to have is an early adopting producer, a large one especially, that can stand up in front of his peers and help me sell that program.

Once we get through today, a lot of the work in promoting this to the rice industry will be mine. And if we can't get this large producer to get these credits acceptable under this program, my job will be infinitely harder. Instead of having 5,000 acres to talk about, we will have just over 1,000 to try to convince a half a million acres of rice growers to embrace this and engage it. They need compelling stories from my three remaining pilot producers that are on the table, especially the largest one, for me to do this work effectively.

So while I said support in December, I wish I could say support now. I will not say oppose. I'll just say I'm a little disappointed that we weren't able to figure this one out going into today's hearing. *(CRC-4)*

Comment: To date there are 21 farmers with 253 fields on 22,213 acres who have listed projects with the American Carbon Registry (ACR). We expect the generation of the first set of credits from this protocol to happen later this year. The adoption of the Rice Protocol, the issuance of voluntary credits and the conversion of those credits into Early Action offsets will encourage other growers to participate – providing capped entities with high-quality offsets from U.S. rice growers. Not being able to convert these credits to Early Action offsets will hamper the ability to engage with other growers, eliminating a very important element to promoting the broader participation of agriculture in the Cap-and-Trade program.

Three rice cultivation offset projects have been listed with ACR. These farmers have voluntarily taken the initiative to implement GHG reductions and should be recognized as part of the “early voluntary reduction” intent under section 38562 of the AB32 legislation.

We applaud the inclusion of the ACR rice protocols under section 95990 (c)(5)(H) of the Cap-and-Trade regulation amendments. Many of the farmers participating in the listed projects have been engaged in the development, testing and feedback of the ACR protocols for more than four years. ARB staff needs to continue to work with the diverse stakeholders developing these projects to understand the challenges and identify opportunities for these projects to be brought into the Cap-and-Trade program as Early Action projects. *(EDF-3)*

Comment: With our parent organization’s headquarters and roots in the Mid-South and ACR’s base in Sacramento – the two leading rice-growing regions in the U.S. - ACR has a strong interest in ensuring the workability of the ARB compliance offset protocol for rice cultivation as well as providing credit for Early Action. After two years of development, ACR published a voluntary rice offset protocol for California in 2013 and the Mid-South module in 2014. To date, three rice cultivation offset projects have been listed on ACR. These three projects total 21 farmers with 253 fields on 22,213 acres, and we expect the generation of the first credits from these projects later this year.

These farmers have been engaged in the piloting of projects and providing feedback on the protocol for four years and have taken voluntary initiative to implement verified greenhouse gas emissions reduction actions. We believe that those actions should be recognized under the "early voluntary reduction" intent under Section 38562 of the AB32 regulation.

…ACR supports the approval of its Voluntary Emission Reductions in Rice Management Systems Parent Methodology, with associated California and Mid-South Modules, as an Early Action protocol. It is crucial to recognize the leaders in the industry, both in California and in the Mid-South Regions, who are pioneering the eligible project activities and have the potential to provide an example and lend encouragement to new project participants who are considering entering the market. However, by stating in Section 95990(i)(1)(H)(2) of the proposed amendments that "no ARB offset credits will be issued for GHG emission reductions credited by an Early Action Offset Program based on a baseline set applying data from the common practice in the rice growing region rather than data specific to a project's fields" the proposed language will exclude a majority of the potential early action offset credits from California. The current wording of 95990(i)(1)(H)(2) requires the innovative growers, who are part of the voluntary projects listed with ACR, to compile five years of historic data prior to the project start date to establish a baseline and to calibrate the DNDC model in order to be eligible for early action offset credits. Many of the projects have implemented the ARB eligible practices from earlier start dates, and therefore the required historic data are less available.

ACR recommends that ARB strike the language that "no ARB offset credits will be issued for GHG emissions reductions credited by an Early Action Offset Program based on a baseline set applying data from the common practice in the rice growing region rather than data specific to a project's fields." While the above comment is specific to the application of common practice baselines under an Early Action program, ACR also hopes that ARB considers this change for the Compliance Offset Protocol in the future. *(ACR-4)*

> **Response:** Multiple commenters requested ARB to allow rice projects to use a common practice baseline, reasoning that projects should not be penalized for lack of keeping records they could not have known would be required to set a baseline for future projects. The common practice baseline implies that a project can receive offset credits for an activity it was already implementing prior to project commencement, because neighboring farms are not implementing the same activity. The forestry definition of common practice is distinct from what is occurring as a result of projects implementing the ACR rice protocol. These participating farmers implemented project activities as a result of the ACR protocol and are having difficulty obtaining the historical data required for use of the field specific baseline. ARB recognizes this

difficulty and is committed to working with early adopters to help them identify the necessary data to allow their projects to be credited under the compliance offset program while meeting AB 32 offset criteria.

ARB disagrees with Terra Global's comparison of a common practice baseline for rice cultivation projects as similar to current methods in the Forest Protocol. The common practice baseline in the Forest Protocol sets an absolute minimum baseline. The common practice value is not the only determining factor of the actual baseline, which must always be modeled considering business-as-usual practices and any laws, regulations, or legally binding mandates which might influence the project's stocking level. The common practice value prevents forest projects from modeling the baseline lower than what is common stocking in the area. The common practice values in the Forest Protocol should be viewed as a floor under which stocking cannot be credited. This is in no way parallel to the ACR protocol allowing a baseline to be set based on activities that do not occur on the project.

B-2.2 Comment: The protocol should include a stronger and clearer consolidation option to allow for cost efficient yet highly creditable verification. If growers currently engaged in approved methodologies cannot be included and the ARB protocol does not offer processes that reduce the costs across a group of projects; farmers will not have the economic incentive to participate and will become discouraged from entering the market thus dropping out of the active pilot programs, investors will lose interest in providing the financial resources needed to build a supply of compliance offsets, and service providers (project developers and verifiers) will stop making the investments need to facilitate an efficient market. *(TGC-2)*

Response: The protocol, as drafted, allows OPOs to consolidate project reporting so one APD may submit one OPDR for multiple projects, representing multiple OPOs. However, as discussed on page 20 of the Staff Report, each individual project within a consolidated OPDR must be verified separately. Individual project verification is necessary to maintain the rigor of the compliance offset program. For projects that produce fewer than 25,000 metric tons of GHG reductions in a reporting period, verification may be deferred to the next reporting period or for up to two reporting periods if no GHG reductions were reported for one of the three reporting periods. Additional potentially cost-saving approaches to verification will be explored in the pilot verification program.

B-2.3 Comment: We are encouraged by the inclusion of the ACR rice protocol for early action crediting in Section 95990 (c)(5)(H) of the proposed regulatory amendments, which will allow these projects to be brought into the Cap-and-Trade Program as Early Action projects. However, the Early Action project requirements for

setting baselines and for crediting of ineligible activities need to be clarified per our comments below or greater than 50% of the acres currently listed with ACR will not be eligible for Early Action credit.

…Section 95990(i)(1) states that "One ARB offset credit will be issued for one early action offset credit for each early action reporting period that did not include emissions reductions from nitrous oxide (N2O), soil organic carbon (SOC), reduced fossil fuel consumption and activities ineligible under the Compliance Offset Protocol in section 95973(a)(2)(C)(6)". We understand the intent of this section is to state that credits issued to an early action project reporting period are only eligible for conversion to ARBOCs if they result from a reduction in methane emissions. However, we feel that the text is not clear as currently written and that it actually implies that no credits are eligible for conversion to ARBOCs for any reporting period for which there was credit issuance against emissions reductions from nitrous oxide (N2O), soil organic carbon (SOC), reduced fossil fuel consumption and activities ineligible under the Compliance Offset Protocol in section 95973(a)(2)(C)(6). For clarity we suggest the following type of edit: "One ARB offset credit will be issued for one early action offset credit **that is not attributable to** ~~for each early action reporting period that did not include~~ emissions reductions from nitrous oxide (N2O), soil organic carbon (SOC), reduced fossil fuel consumption and activities ineligible under the Compliance Offset Protocol in section 95973(a)(2)(C)(6)". *(ACR-4)*

> **Response:** ARB staff assumes the commenter is specifically referring to the language in Section 95990(i)(1)(H)1. of the regulatory amendments. To receive credit for eligible emission reductions for early action periods that included ineligible activities, OPOs would follow the procedure specified in Section 95990(i)(1)(H)1.e. in the proposed 15-day modifications to the regulatory amendments. An addendum to the verification report would be required showing that the quantity of offsets was accurately adjusted and ineligible sources excluded.

B-3. Eligibility, Quantification, and Reporting of Projects

B-3.1. Multiple Comments: We recognize that ARB has specified that quantifications performed must use the DNDC model posted on the ARB's Rice Protocol Resources site and that ARB has a contract with a developer to improve the model and it user facing front-end. We want to ensure that any version of the DNDC model used now or in the future can be accessed directly with the use of DND input files and output files, without the requirement to work through a user interface. A number of resources have been invested into the development a platform to facilitate efficient aggregation of projects and verification requirements and this system has the capacity to generate DND input files and emission reduction

calculations using the output files. It would be highly desirable to provide users the flexibility to use external systems that link to the ARB approved DNDC model to meet the requirements under the ARB Rice Protocol, without requiring the user to re-enter field data into the DNDC user interface. There should be complete transparency on any requirements beyond the standard inputs and outputs for DNDC needed to produce emission reductions. We will continue to expect ARB to be fully transparent on any new developments in the use of the DNDC model and which models are approved and that they are publically available. For instance, the research and DNDC input files used to determine the structural uncertainty value has not yet been made publicly available. Transparency in how the DNDC model can be most effectively used specifically for rice production and for the approved rice growing regions will ensure greater understanding and trust in the resulting carbon credits generated. *(TGC-2)*

Comment: The Rice Protocol is the first protocol to use a process-based model, the Denitrification Decomposition (DNDC) model, which is an important tool to quantify GHG emission reductions from agriculture-based offset projects. DNDC is a very detailed model and as such requires significant inputs and generates comprehensive outputs. We support the ARB's ongoing effort to develop a simplified front and back end to the tool to make it more accessible to growers and offset project developers. This tool will ease the burden of entering input data into DNDC and consolidating DNDC output data, and thus will lower the barriers to the adoption of the protocol. We encourage the ARB to release a draft of the tool this fall in advance of the anticipated the training of ARB-Accredited Verification Bodies, ARB Approved Offset Project Registries, Offset Project Operators (OPO) and Authorized Project Designees (APD). *(EDF-3)*

> **Response:** There is no requirement to use any tool developed to simplify and streamline calculations of emission reductions using the DNDC model. Project operators are free to use the original DNDC model, available on the ARB website, for all model runs. ARB staff anticipates a beta version of the tool will be available in the fall for review, with a final version available in early 2016.

B-3.2. Comment: This current protocol is much improved for providing flexibility in the general requirements and documentation requirements for each specific project activity. It should be extremely clear that the inclusion of new monitoring technologies to demonstrate project activities is allowable subject to verifier's review and support flexibility on sources of proof/evidence to help decrease the burden on growers and increase adoption. *(TGC-2)*

> **Response:** The inclusion of new monitoring technologies to demonstrate project activities is allowable, as long as it meets the requirements of the Regulation and protocol. The use of monitoring technologies is at the

discretion of the OPO/APD, and must be sufficient to allow the verifier to reach a level of reasonable assurance that the data is accurate and in conformance with the requirements of the Rice Protocol and the Regulation.

B-3.3. Comment: For agricultural offset protocols to generate emission reductions, growers need to combine their individual GHG emission reductions into quantities large enough to be cost effective to implement and sell to compliance entities. In addition, many compliance entities will only purchase projects which have the potential to generate more than 25,000 metric tons. To get to scale, there are two significant drivers important to making these projects successful– reporting and verification.

We are pleased that the ARB will allow multiple growers to report their GHG emission reductions on a single Offset Project Data Report (OPDR). The identification of each OPO in the consolidated OPDR will allow the project to continue if there is a problem with one of the OPOs. Consolidating growers in one report will reduce the overall time, paperwork, and cost required to create a project while maintaining the highest quality of offsets. There are significant data collection requirements necessary to produce an OPDR from rice cultivation activities and the reductions per acre are forecasted to be small – less than one ton per acre. Therefore, we applaud the ARB's willingness to create a consolidated reporting template, which will reduce the time required to participate, thus encouraging more growers to undertake GHG-reducing activities. *(EDF-3)*

Response: ARB appreciates the commenter's support.

B-3.4. Comment: The questions and comments we raise below not only relate to whether this protocol meets the standards laid out for all tradable credits under AB 32, but also to making explicit the criteria and procedures used to develop this protocol, and the precedent this protocol may serve to other future protocols in the agriculture sector. In our comments below, we raise two substantive concerns regarding the evidentiary basis of the Protocol and the quality standards used by ARB in developing this protocol.

First, we note that the DeNitrification DeComposition (DNDC) model used in the Protocol to estimate emissions reductions was been validated using a static old and incorrect atmospheric CO2 concentration of 350 ppm for site-years of data from the late 1980s to 2012. These 87 site-years of data are the basis on which DNDC has been validated for rice cultivation in California and the Mid-South. When we redid the validation of DNDC using appropriate atmospheric CO2 concentrations for each of the 87 site years of data, we found that the Protocol as written will not achieve the level of conservativeness intended by the ARB unless the uncertainty deduction factor is updated.

Second, for over a year we have asked ARB staff a very basic question about the scientific basis of the Protocol—is the model used to estimate emissions reductions by projects under the Protocol adequately validated for each of the new practices being credited?—without yet receiving an answer for alternative wetting and drying (AWD) projects. We have asked many times for the basis on which the DNDC model has been validated for alternative wetting and drying (AWD) projects in the Mid-South. Such a question is relevant given that validation of the model is based on only one site-year for a field employing AWD practice, and given that the emissions release processes are different for fields employing this practice than for fields employing continuous flooding. We are surprised and concerned that ARB is moving forward with the final version of the Protocol before its staff has a satisfactory answer to this important question.

These two issues make us concerned that ARB has abdicated quality control responsibility to contractors without sufficient oversight, and without being responsive to stakeholders who identify potential quality control issues. We identified and analyzed these substantive concerns with a relatively small amount of effort; it is clear to us from these two examples that ARB should not adopt the DNDC-based Protocol until staff has undertaken more thorough validation. We stress that we have been good faith participants in the Technical Working Group process since its inception in 2013, and that we have repeatedly engaged with ARB staff about our concerns, in person, on the phone, and over email, for over two years.

We also stress an important procedural concern related to the responsiveness to staff to stakeholder questions related to the scientific basis on which the Protocol has been developed and is recommended for adoption. We are surprised that ARB released a final draft of the Protocol without answering our question about the basis on which DNDC has been deemed validated for AWD projects, which we have repeatedly asked and to which we have been promised an answer. First, we stress the importance of peer review. Accurately estimating emissions reductions from offsets projects, especially when they involve land use change, is complex. Input from stakeholders is essential to the process of developing a protocol that is scientifically sound. Answering relevant stakeholder questions about the scientific and factual basis of the protocols ARB develops is necessary for peer review. Answering such stakeholder questions is also an essential part of notice and comment rulemaking. A public review period is ineffective if the public is not provided the information needed to review the protocol being put forward for public comment or if the agency fails to respond to material public comments. This is also essential from the perspective of instilling public trust in ARB's offset program. Answering public questions about the scientific basis of ARB's protocols is especially important for offsets, the use of which will allow continued or increased operation of

facilities such as refineries in communities suffering disproportionate environmental and health impacts.

Finally, we raise a last substantive concern about the evidentiary basis for project types being found to pass the Performance Standard test for additionality. Given the problems associated with data transparency, response to stakeholder concerns, and quality control, we stress that ARB has not provided sufficient recent evidence for the decisions that it has made regarding additionality assessments. Most data cited are older than ten years.

We are looking forward to receiving answers to the follow questions about the proposed Protocol:

1. DNDC should be validated using corrected values for atmospheric CO2 concentrations appropriate for each site-year of data used in the validation; doing so may result in the need to generate a different uncertainty deduction factors for each rice growing region.

The following comments are submitted in relation to the modification of Equation 5.4 to use a fixed structural uncertainty deduction factor, rather than a variable value, and to remove the use of separate uncertainty deduction factors for each rice-growing region.

Previous versions of the Protocol included the use of separate structural uncertainty deduction factors for each rice growing region. In those versions, separate structural uncertainty deduction factors were calculated, based on the site-years of available data from each rice growing region, with the *a priori* assumption that climatic and soil variability between regions might lead to identifiable and consistent differences in the uncertainty of DNDC's estimations of methane (CH_4) emissions and reductions between the rice growing regions. In Equation 5.4 in the current Protocol draft, these separate uncertainty deduction factors have been removed.

While the rationale for the removal of these separate factors was not directly stated in the Summary of Proposed Modifications (only the choice to use a single fixed value of 0.128 $MTCO_2e$/ha rather than a variable value based on the number of acres enrolled in projects was explained), it is our understanding that the evidentiary basis for the change lies in a statistical analysis that concluded there was no difference in the performance of the DNDC model between states and that the best-fit statistical model was a mixed-effects model that included a random term for site-year and was selected using an information-theoretic approach. This analysis was performed by ARB contractor, Dr. William Salas of Applied GeoSolutions, and sent to us via email on February 18th, 2015. The text of that analysis, which provides the rationale for using a single uncertainty deduction factor for the DNDC model in the

context of a carbon market in the United States is appended to this comment as Appendix A and Appendix B.

Is the statistical analysis performed by Dr. William Salas included in this appendix the evidentiary basis for the choice by ARB to use a single structural uncertainty deduction factor, rather than a separate one for each rice growing region?

We assume that it is. Our assumption is based on the following: Dr. Salas has repeatedly presented information on DNDC validation to the Rice Cultivation Projects Technical Working Group. Information from Dr. Salas, including the graphical representation of the structural uncertainty deduction, was presented by ARB Staff in their Workshop presentation on February 20th, 2015. Dr. Salas has spoken to us on the phone along with ARB Staff about these issues relating to DNDC validation on March 19th, 2015, and Board Staff have repeatedly directed us to Dr. Salas, when we approached ARB staff as stakeholders with questions and concerns about DNDC validation.

We do not have any concerns about the scientific approach to statistical analysis that was performed and outlined in the appended documents, Appendix A and Appendix B. Our concern lies instead with the data on which these analyses were performed. Based on our analysis, we believe that there is a substantive error in the values of the modeled methane (CH_4) fluxes used in the validation assessments.

DNDC model validation for CH_4, the calculation of the structural uncertainty and deduction factors, and the statistical analyses to determine whether separate factors were needed for different regions were all performed using a set of 87 site-years of measured CH_4 fluxes. These data were presented graphically by Board staff during a Workshop on February 20, 2015. The measured CH4 fluxes are rice fields in the United States from four states Louisiana, Arkansas, Texas and California, all made between1989-2012. All of these data were published in peer-reviewed literature, and list of these publications was made available to the public by the Board Staff.

The modeled CH_4 fluxes used in the analysis to assess DNDC model performance were based on model runs performed by Dr. Chengsheng Li at the University of New Hampshire. As stakeholders interested in the integrity of the Protocol and the validation of the DNDC model for use in estimating emissions, we wanted a chance to review the model input files and parameters which were used to estimate emissions for the 87 site-years of field measured data. This is because the output of these model runs forms the entire basis for the assertion that the DNDC model is an accurate representation of methane emissions from rice cultivation in the United States and is thus a critical component of the rationale for the use of the model in the first place. The input values and model parameters from these model runs were not made publically available during the Technical Working Group Process. The only information during this process that was made publically available was the

graphical representation comparing modeled and measured CH4 fluxes and a list of the peer-reviewed publications from which the measured CH4 fluxes were taken. No information on the details of the model runs was provided to the public at this time.

After repeatedly asking ARB staff for access to the original model input files by email, in submitted comments, over the phone and in person, on March 19th, 2015, on a phone call with Dr. Greg Mayeur and Dr. William Salas, Dr. Salas offered to send us a .rar file which included the DNDC input files used in model validation and the original spreadsheet of data from Dr. Li on which subsequent statistical analyses of model uncertainty had been performed. These files were sent to us as well as to ARB Staff via DropBox on March 22nd, 2015, for which we are very thankful. Having access to these critical data is essential to assessing the basis on which ARB Staff have proposed using the DNDC model. These files included input files for 84 of the 87 site-years used in analysis. Three files were missing (for Brennan 2010 California Mid-Season drainage, RES 2011 California M206, and for Rogers, Stuttgart 2011 California Between-rows).

Since receiving the input files electronically, we have performed several analyses. We double-checked that the information on soil type, crop, flooding, irrigation, and fertilizer was correctly transferred from the information in the peer-reviewed literature to the DNDC input file. In all cases that we checked, this was done accurately, with only one minor issue: the climate data in the input file for four varieties in the “Merle, Stuttgart” files from Arkansas was from 2011, but the methane measurements were made in 2012. But, updating these climate data files to 2012 climate data from the same site, and re-running the model had only a modest effect on the output results. Using the DNDC95.exe program, we then re-ran the model using the input files sent to us in order to re-create the reported “modeled” CH4 emissions file in the spreadsheet, and were able to achieve the same results as reported and presented to the Technical Working Group.

However, we did note an issue of major substantive concern with how the DNDC model was run for model validation. For 80 of the 84 input files that we were sent, representing field measurements from 1989 to 2012, the background atmospheric CO_2 concentration used in the model was set to the DNDC default value of 350 ppm (For reference, the 15-day draft Protocol uses a default value of 400ppm). For 4 of the 84 files, representing field measurements in 2012, the background concentration was listed as 370 ppm.

Global average CO_2 concentrations have not been at 350 ppm since the mid-1980s. In 2014, global average atmospheric concentrations were 398.6 ppm. The table below shows the average atmospheric CO_2 concentration, globally, for the years included in the validation dataset. The data are provided by the National Oceanic and Atmospheric Administration (NOAA) as a global average:

Year	CO_2 (ppm)
1989	352.91
1990	354.19
1991	355.59
1992	356.37
1993	357.04
1994	358.89
1995	360.88
1996	362.64
1997	363.76
1998	366.63
1999	368.31
2000	369.48
2001	371.02
2002	373.10
2003	375.64
2004	377.36
2005	379.63
2006	381.81
2007	383.59
2008	385.45
2009	387.36
2010	389.90
2011	391.65
2012	393.88
2013	396.52

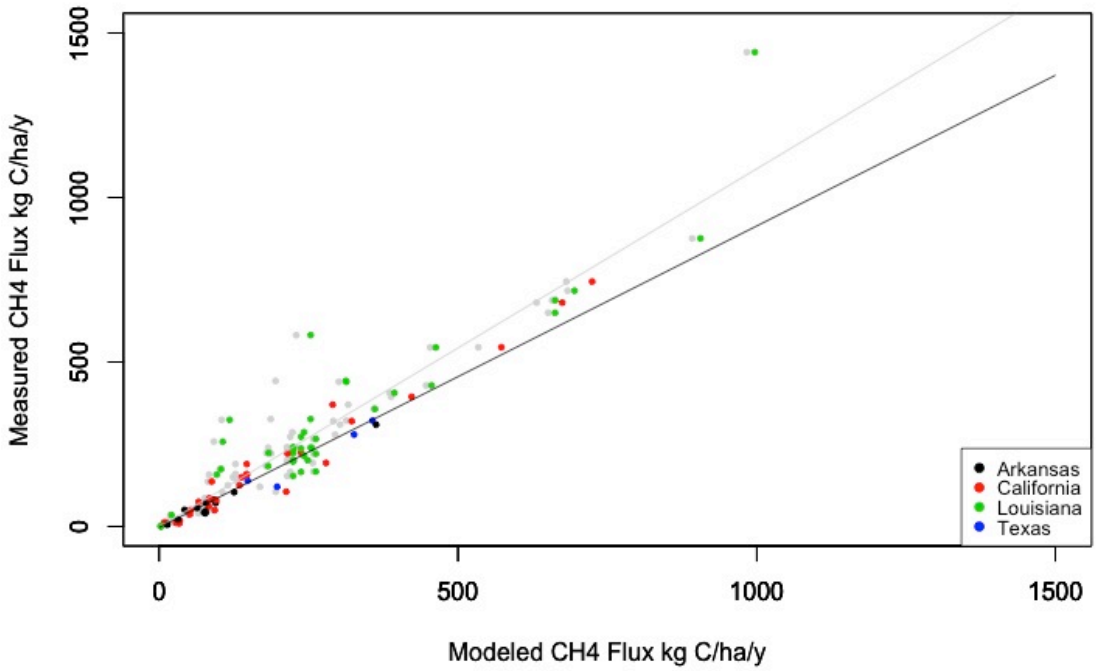
2014 398.60

The use of 350 ppm instead of the actual atmospheric concentration for that year is a major cause for concern because these default values in the validation runs of the model are too low for the years in which the measurements were made. While *in situ* atmospheric concentrations of CO_2 can vary daily and seasonally due to local conditions, the background value used in the model is intended to represent the concentration for the entire year that is being run.

The atmospheric concentration of CO_2 is a critical value in calculating methane emissions from rice cultivation because higher atmospheric CO_2 values lead to greater CO_2 fixation by crops and ultimately a larger store of organic carbon available for methanogenesis. Thus, the fact that these concentration values were not updated in the input files used for the validation data set means that the ***modeled CH_4 fluxes used for assessing DNDC uncertainty are not correct.***

After realizing this error, we reran the DNDC model using the corrected atmospheric CO_2 concentrations found in the table above. Doing so had an average effect of increasing the model-estimated annual CH_4 emissions by 8.4±7.1 kg CH_4-C ha^{-1} y^{-1}, with a max effect of a 48.4 kg CH_4-C ha^{-1} y^{-1} increase, representing a greater than 13% increase in the modeled emissions value from this single input factor correction. The effect of this error is more pronounced for more recent years, as atmospheric concentrations were much farther from the default 350 ppm in 2012 than in 1989.

The effect of our correcting the modeled outputs is not insignificant. The graph below shows the shift in the graphical representation of the modeled vs. measured outputs and the corresponding shift in the best-fit model (represented by the lines) from the one provided by Dr. Salas. (Grey points are the original model, colored points are the updated values, the darker line reflects the shifted best-fit model using the information-theoretic approach used by Dr. Salas). The ultimate result is that, because updating the CO_2 concentrations has the effect of increasing all modeled values (to varying degrees), the entire correlation shifts to the right in the graph.



There are several important implications of this shift in the model-output data. The first is that the value of the structural uncertainty deduction used in Equation 5.4 (0.128 $MTCO_2e$/ha) needs to be recalculated.

The structural uncertainty deduction factor is a function of the modeled relationship between measured and modeled CH_4 fluxes and the number of participating acres in the aggregate to which it is being applied. Calculating the factor results in an amount of tCO_2e per hectare that should be deducted from calculated emissions reductions due to the structural uncertainty of the model's performance.

That value of 0.128, according to the Summary of Proposed Modifications, is the "plateau" value that is achieved at around 5,000 project acres total. (Previous versions of the Protocol had updated the uncertainty deduction values based on the number of acres of rice participating each year, but it was found that the amount of anticipated projects passes the asymptotic threshold so a set value could be used, which makes sense).

Following Appendix A, the structural uncertainty deduction is calculated from the following equation:

$$u = \left(1-\hat{\beta}_1\right)\hat{T} + t_{1-\alpha,k-2}\sqrt{\hat{T}^2\,\mathrm{var}\left(\hat{\beta}_1\right) + \sigma^2\sum_{i=1}^{n} a_i^2\left(x_{pi}^2 + x_{bi}^2 - 2x_{pi}x_{bi}\rho_{bp}\right)}$$

Where:

Symbol	Definition
u	The uncertainty deduction for the aggregate; the amount to be deducted from $\hat{T}$
$\hat{T}$	The total modeled offset for the project
β_1	The fixed-effect slope associated with x in the regression model
$t_{1-\alpha,k-2}$	The value of Student's t with error rate α. k is the number of baseline-project pairs in the validation data set.
σ^2	The total variance of the error term in the regression model, including all random effects as well as the true residual
ρ_{bp}	The correlation between errors for a baseline-project pair observed at the same site and year
a_i	Area (ha) associated with an individual field in the aggregate. Under current assumptions, a_i is treated as equal to 1, and n is the total area (ha) of the aggregate.
x_{pi}	DNDC-predicted flux (kg/ha) associated with an individual field, using the project treatment
x_{bi}	Corresponding DNDC-predicted flux associated with an individual field, under the baseline treatment

The following parameters in this equation are calculated from the summary of the variance of the "best-fit" statistical model comparing measured and modeled emissions:

β_1

σ^2

ρ_{bp}

As described in Appendix A, from all the information that has been made available to us by Dr. Salas, it is our understanding that the original best-fit statistical model was selected using an information-theoretic approach based on Akaike Information Criterion (AIC), with a mixed-effects model with a random effect for site-year, implemented in the *nlme* package in the R statistical program. Appendix A shows how the parameters for the uncertainty equation are calculated from the information on the variance of the model.

We have re-run the exact same code in the R statistical program (the *nlme* package) as Dr. Salas. Using the data originally sent to us on March 22nd, 2015, we were able to obtain the exact same parameter numbers for β_1, σ^2 and ρ_{bp} that are given in Appendix A, so we have confidence in our performance of the statistical analysis. As Dr. Salas had asserted in Appendix B, in our re-creation of his analysis using the same data and approach described, the best-fit model was the one reported and used in calculating structural uncertainty that was used in the Protocol.

We have now re-run this statistical analysis to pick the best-fit model using the *nlme* package in R using our corrected model output values using correct

values for atmospheric CO_2 concentration. The summary of the nlme new best fit model, based on AIC criterion is given here (this is the same summary form as was provided in Appendix A).

```
Linear mixed-effects model fit by REML

 Data: data

       AIC      BIC    logLik

  949.0669 958.8375 -470.5335


Random effects:

 Formula: ~0 + x | State

                x  Residual

StdDev: 0.2013773 0.4270917


Variance function:

 Structure: Power of variance covariate

 Formula: ~x

 Parameter estimates:

power

    1

Fixed effects: y ~ x2

                Value Std.Error DF   t-value p-value

(Intercept) -3.482680 0.7602852 82 -4.580754       0

x2           0.916452 0.0978295 82  9.367854       0

 Correlation:

   (Intr)

x2 -0.124
```

Standardized Within-Group Residuals:

Min	Q1	Med	Q3	Max
-1.85885372	-0.55547852	-0.06493635	0.29953547	4.22015353

Number of Observations: 87

Number of Groups: 4

Using this new model has several effects. First and foremost, it changes several of the terms used in the structural uncertainty deduction calculation. These changes are given in the table below. They have the effect of slightly increasing the uncertainty deduction factor. Given that this model is the basis for the choice of a uniform number (0.128 $MTCO_2e$/ha) in the Protocol, our results demonstrate the need to correct the structural uncertainty deduction to reflect the updated modeled results based on the updated best-fit mixed-effects model. This new factor still plateaus at a given number of acres, but the number at which it plateaus is different from that reported and is slightly higher.

	Original Model	Corrected Model
β_1	1.0859	0.9165
var(β_1)	0.00516	0.009570611
σ^2	0.211	0.222960137
ρ_{bp}	0.2164	0.18188371

AIC for model with corrected data and random effect of site year: 950.141

AIC for model with corrected data and random effect of state: 949.0669.

Choose: Model with random effect of state.

The lower the AIC, the more likely the model is supported by the data.

Based on the model output data that were calculated using 350 ppm, the single uncertainty deduction factor for all regions was strongly supported by the data. However, with the updated data using the actual atmospheric CO_2 for each year to run the model, the data support a separate uncertainty deduction factor for each

region. This is driven by a difference in model performance for Louisiana site-years compared with other states.

It is important to emphasize that none of these new results suggest that the DNDC model is not appropriate for use in estimating emissions reductions. They do, however, suggest the need for a more careful examination of the site-years of data and the input values used for the model runs in the validation dataset.

The above analysis does show substantial reason for concern that the process used to validate the DNDC model, and to assess its uncertainty and bias, merits another look and careful quality control. With access to the original data and input files, our quick look "under the hood" found an error that changed one of the key statistical conclusions about the model's performance, suggesting a revisitation of several of the modifications in the 15-day draft. We have not, however, performed and exhaustive audit or peer-review of the model validation.

We humbly suggest that the ARB take the time necessary to assess all the available information about DNDC performance to make sure the numbers and assertions in the Protocol are, in fact, as good as they can be. In our opinion, this need not be a lengthy delay, but more time is clearly required to get the numbers right, as evidenced by the information provided above.

We note that all our analyses are based on the 87 site-years of data that have been presented in public presentations of model validation and that were shared with us upon request. There may have been additional site-years of data used in the analyses that formed the rationale for use of the model in the Protocol, though we have no information to this effect. However, even if there were additional site-years of data used in the final dataset that was used to calculate the uncertainty deduction factor used in the Protocol, the substantial issue remains that model validation was performed using a default value for atmospheric CO_2 concentration that was not updated to reflect actual on-the-ground conditions, nor in a manner consistent with the default values in the Protocol itself.

We request ARB to provide a full documentation of the rationale and evidentiary basis for its assertion that the DNDC model accurately estimates emissions of CH_4 from rice fields in the United States, and for the choice of uncertainty deduction factor in Equation 5.4. We have performed the above analyses using all the publically available information, in addition to information provided to us in private communication by ARB staff and by contractors working with ARB staff.

2. On what basis has DNDC been validated for AWD projects in the Mid-South?

The following comments are submitted in relation to the modification of Equation 5.4 to use a fixed structural uncertainty deduction factor, and its implications for DNDC model validation, specifically for AWD projects.

In the Staff Report accompanying the 45-day draft of the Rice Protocol, released on October 28, 2014, the report explains why the Alternate Wetting and Drying (AWD) project-type is only eligible for crediting in the Mid-South:

“However, alternate wetting and drying is only an eligible project activity in the Mid-South Rice Growing Region under the proposed Rice Cultivation Protocol because the DNDC model has not been validated for this activity in the California Rice Growing Region. If validation of the DNDC model for alternate wetting and drying occurs in the future, ARB will consider adding it as an eligible project activity.”

This rationale strongly implies that the DNDC model has been validated for the AWD project activity in the Mid-South Rice Growing Region.

In Appendix B to this document, which outlines the evidentiary basis for using a single uncertainty deduction factor in the Protocol, a modification found in the 15-day draft, provided to us by Dr. William Salas, it is carefully explained that there is no statistical difference in model performance between the rice-growing regions or between individual states, even though a priori one might assume that the soil and climatic variability between the regions might suggest a basis for a difference in performance. However, this documentation does not mention an analysis of DNDC model performance by separate project activity types, despite the implication that a validation assessment (comparing the relationship of measured to modeled emissions) for this particular project type had been performed.

We thus had several questions about AWD project validation:

Has the DNDC model been validated for AWD project activities in the Mid-South region? Has this validation been distinct from the overall validation dataset involving 87 site-years that has been presented by Board staff? On what basis was this validation for AWD done?

How the DNDC model performs estimating methane emissions from a rice field in which an Alternate Wetting and Drying practice has been implemented may not be the same as how the model performs estimating methane emissions from fields not doing AWD. In fact, the peer-reviewed literature suggests that repeated spikes in emissions can occur due to wetting and drying, as biogeochemical conditions shift from anaerobic to aerobic and back again (Linquist et al. 2015). Thus, an AWD project is treating accumulated methane from methanogenesis and its emission very differently than other project types do. It is thus critical to ascertain whether the DNDC model estimates emissions for AWD projects with the same uncertainty as for other field conditions.

Because of this critical need, and the language in the October 28, 2014 Staff Report implying that DNDC’s ability to accurately estimate AWD emissions had been validated for the Mid-South, but not for California, we spoke with ARB Staff Dr. Greg

Mayeur and with ARB contractor Dr. Bill Salas of Applied GeoSolutions on March 19th, 2015 by phone to express our concern. During that phone call, all parties agreed that a separate analysis of the uncertainty of model performance for AWD projects that could be compared with the overall structural uncertainty calculated from all site-years in the validation dataset made sense. Mimicking the analysis done for individual regions and states outlined in Appendix B, this analysis would allow us to determine if the uncertainty in model performance for AWD project CH4 emission estimation was different from uncertainty for non-AWD projects.

At the time, Dr. Salas indicated that he would provide statistical analysis comparing the uncertainty for AWD projects with that of all site-years in the data set, as had been done for the rice-growing regions (see Appendix B)

As of June 2nd, 2015, after several follow up emails and phone calls to Dr. Mayeur, we had not seen this additional, critical analysis.

Because we have not seen the results of an analysis of structural uncertainty of the DNDC model for CH4 emissions on a project-basis, and because there are a priori reasons, based on data presented in peer-reviewed literature to suspect that the model may perform differently for AWD projects than for other projects, we are concerned about the use of the DNDC model for estimating emissions reductions from AWD projects.

Thus, these key questions remain unanswered:

Is the use of a single structural uncertainty deduction factor, based on the site-years of data that are available, justified for all project types, including AWD? If so, on what basis is it justified? Is there any difference in structural uncertainty of the DNDC model for AWD projects when compared with the data set of all available site-years from the United States? On what basis do we know that DNDC's structural uncertainty in the estimation of CH4 emissions and emissions reductions is the same for AWD projects as for other projects?

As such, we are unable to provide adequate comment on this protocol because ARB has failed to provide key elements of the evidentiary basis for their decision.

In particular, our review of the 87 site years of data reveals that only 1 site-year includes an AWD project (in Arkansas -- though there may be more recent ones that were published in 2015). Thus, with the evidentiary basis that is currently available for public review, we can conclude that it is only on the basis of this single data point that ARB has determined that the DNDC model can accurately estimate emissions of CH4 from a field implementing AWD in the Mid-South. The one-data point had a measured flux of 5.00 kg CH4-C ha-1 y-1, compared with an estimated flux of 11.84 kg CH4-C ha-1 y-1. This is not enough information on which to make an assessment of model performance for AWD. It does strongly suggest that the DNDC model likely

will do a good job estimating emissions reductions from AWD, but we simply don't know and cannot know with the available information.

It is important re-emphasize that a project-type specific assessment of model validation was referred to by board staff in their Staff Report from October 2014. That assessment has not been made available, and the available evidence suggests that the assessment was made on the basis of a single data point. If this is not the case, and additional site-years of information were used to perform a statistical analysis, we have not seen that analysis and therefore we are unable to provide adequate comment on this protocol because ARB has failed to provide key elements of the evidentiary basis for their decision.

We want to emphasize that our concern is not as much with any evidence that DNDC is *not* performing well enough, but that the information that is available is not adequate to make a positive assertion that DNDC is validated for this project-type. If there are additional lines of information that lead ARB to this conclusion, we look forward to seeing them.

3. On what basis is the Protocol considered to meet the requirement that the credits generated under the Protocol must be real and conservatively estimated with regard to the effect of N2O emissions on the number of credits generated?

The following comments are submitted in relation to the modifications of terms in Equations 5.2.1., 5.3.1, 5.3.2 and then the subsequent use of these calculated values in Equation 5.4.1, specifically as they relate to the calculation of nitrous oxide (N2O) emissions.

We understand that the Protocol does not credit reductions in nitrous oxide (N_2O) emissions from projects, and only allows for a debit based on increases of N_2O emissions that may result from project implementation (this is reflected in the "MIN" term in Equation 5.4.1.)

However, we are not aware of any presentation of information demonstrating that the DNDC model has been validated for estimating N_2O emissions. All information presented to the Technical Working Group related only to validation of CH_4 emission estimation.

Is it true that the DNDC model been not been validated for N2O emissions from rice cultivation in the United States? And if so, on what basis is the Protocol considered to meet the requirement that the credits generated under the Protocol must be real and conservatively estimated with regard to the effect of N2O emissions on the number of credits generated?

Based on our phone conversation with ARB Staff Dr. Greg Mayeur on March 19th, 2015, we understand that the only project types for which increases in N_2O emissions might be anticipated are for AWD projects, and that, based on the peer-reviewed literature (i.e. Linquist et al. (2015)), it is expected that such increases will only represent a small fraction of the overall net reduction in GHG emissions from the reduction in CH_4 emissions from such projects. It is also our understanding from conversations with Dr. Bruce Linquist that the only circumstances where large amounts of N_2O might be released from an AWD project would be if drainage occurred immediately following fertilizer application. Such an activity would be unlikely, because of the loss in fertilizer that would result if a farmer were to drain shortly after fertilizer application before the fertilizer has been taking up by crops. We confirmed this assessment on the phone with Dr. Greg Mayeur on March 19th, 2015.

Thus, our concern is not that there is evidence that the inclusion of N_2O terms in Equations 5.2.1., 5.3.1, 5.3.2, and 5.4.1 will result in substantial over-crediting. Our concern is primarily focused on the precedent set by adopting a Protocol which uses of a process-based biogeochemical model that has not been validated to estimate the flux of a greenhouse gas from land use activity. In order to address such concerns about precedent and evidentiary basis for use of a model, in a Protocol which is using such a model for the first time in the Compliance Offset Program, we ask ARB to be explicit and public about how they reached the conclusion that DNDC outputted values of N_2O were sufficiently validated for inclusion in the Protocol.

4. We request more clarification of the basis on which each of the project types is considered additional under the Performance Test Standard.

The current practice data cited in ARB's October 28, 2014 Staff Report and Rice Cultivation Projects Compliance Offset Protocol for each of the practice types is outdated; almost all data are from ten years ago or more. Dry seeding in California, and AWD and early drainage in the Mid-South have been promoted since then due to their water cost and weed control benefits. More current practice rates are important to assess whether these practices are currently common practice. They are also important to enable ex-post assessment of the effects of the Protocol on emissions reductions such as net-to-gross analyses. Without better documentation of current practice, it will be difficult for ARB and outside observers to assess the effectiveness of the Protocol in changing farmer practice.

1. Dry seeding in CA: We understand from Cline (2003) and Carol (2009), cited in October 28, 2014 release of the Protocol and Staff Report, that dry seeding is being encouraged in California due to its advantages for herbicide resistant weeds associated with wet seeding. How much has dry seeding increased since 2009? Is it still being used by a very small percentage of farmers given its benefits?

2. AWD in the Mid-South: What rates are farmers currently performing AWD in the Mid-South? We understand that very few were employing this practice in 2006, but that it has large advantages for water use reduction. But we understand from Hardke 2014, cited in the October 2014 ISOR, that "Intermittent flood or alternate wetting and drying (AWD) is another water management practice that is not currently widely practiced in Arkansas but has been practiced with success in nearby states..." What is current practice?
3. Early drainage the Mid-South: The Counce 2009 article, cited in the October 2014 ISOR, states that farmers are reluctant to drain early for fear of harming the rice but that there would be significant water cost savings. What is current practice for early drainage in the Mid-South where a model is used to determine the baseline drainage date? *(STAN-2)*

Response: The commenter raises four main technical concerns: 1) what is the appropriate atmospheric CO_2 concentration for evaluating the DNDC model; 2) has the model been validated for AWD in the Mid-South; 3) is N_2O accurately quantified under the Rice Protocol; and 4) how was the additionality of the three project types evaluated.

First, the commenter notes that an outdated atmospheric CO_2 concentration was used to validate the DNDC model. While the commenter correctly notes that 350 ppm is no longer representative of current atmospheric CO_2, the DNDC model was validated at 350 ppm CO_2 to accurately model project emissions. In speaking with experts on the DNDC model, ARB staff understands that the DNDC model is not very sensitive to small changes in atmospheric CO_2 concentrations. The DNDC model has multiple default parameters that may or may not accurately reflect the true values present in a project, but these default parameters have been determined, during the development of the model, to not have a significant impact on the model outputs. Slight variations due to default parameters are accounted for in the structural uncertainty deduction that is conservatively required to be applied to all projects. ARB disagrees with the commenter that there is a substantive error in the values of the modeled methane (CH_4) fluxes used in the validation assessments. ARB presented data at the February 20, 2015, workshop showing that the DNDC model accurately models actual measured methane fluxes. Similarly, ARB's conclusion that a single structural uncertainty factor is appropriate for all eligible project types is supported by the validation information made available during workshops and throughout the protocol development process. Therefore, although the most up to date atmospheric CO_2 concentrations were not used, the emission reductions are still real and accurately quantified.

Second, the commenter states that certain data used to validate the DNDC model was not made publicly available. ARB made all methods and data used to validate the DNDC model publicly available during the technical working groups for the Rice Protocol. The commenter had requested the exact files used by the DNDC technical experts to validate the DNDC. ARB staff worked with the DNDC technical experts to provide these files as soon as possible. As the commenter indicated, these detailed data files were sent directly to the commenter by ARB's technical expert via DropBox on March 27, 2015. To date, no other stakeholder has requested this information. As the commenter noted, 87 site-years of data was used to validate the DNDC model. This data represent all the approved practices in multiple permutations and the model was accurately able to reproduce the measured data. There is no reason to suspect that an individual practice would behave any differently in the model than the various combinations of practices used to validate the model. Therefore, ARB staff determined that individual practice validation was not necessary.

Third, the commenter is concerned that the DNDC model may not accurately represent N_2O fluxes. As the commenter stated, ARB has relied on peer reviewed papers and technical experts to determine that the DNDC model accurately represents N_2O fluxes. The protocol treats N_2O emission conservatively. Increases in N_2O as a result of project activities are debited from project emission reduction while decreases in N_2O emission are not credited. Additionally, the protocol debits total emission reductions for structural uncertainty and requires the use of the 90 percentile confidence data assuring the credited emission reductions are real. The commenter has provided no evidence to the contrary and ARB is satisfied that the model is accurately quantifying all greenhouse gas emissions.

And fourth, the process to assess additionality is consistent with the evaluation of the five existing adopted Compliance Offset Protocols. The assessment of additionality was done in accordance with the published ARB process for the review and approval of compliance offset protocols[15]. As stated in the ISOR the peer review literature was supplemented by discussion with the technical working group to ensure the approved practices are not business-as-usual. Contrary to what the commuter claims on the age of the data, of the twelve references cited in the ISOR, eight were published less than ten years ago, and six were published less than five years from when the analysis was completed. Using the best available information, ARB has

[15] California Air Resources Board (2013) California Air Resources Board's Process for the Review and Approval of Compliance Offset Protocols in Support of the Cap-and-Trade Regulation. *available at* http://www.arb.ca.gov/cc/capandtrade/complianceoffset- protocol-process.pdf

determined that the project activities identified in the protocol are additional. The commenter has provided no evidence to suggest anything contrary to ARB's finding.

B-4. Verification of Offset Credits

B-4.1. Multiple Comments: In the current Rice Protocol, ARB requires individual verification statements for every Offset Project Operator (OPO) within a consolidated Offset Project Data Report (OPDR) submitted by a single Authorized Project Designee (APD). We believe this requirement should be changed to require audits of all OPO data, as collected, managed and stored by APDs, but only site visits on a scientifically identified sample of farms or fields within a collective project[16]. If audits reveal errors or indicate problems that may be systemic, a more in-depth verification could be required. *(IETA-2)*

Comment: Currently, the Rice Cultivation Protocol and the Cap-and-Trade Regulation are moving in the right direction by allowing Authorized Project Designees (APD) to consolidate projects from multiple Offset Project Operators (OPO) and submit a consolidated OPDR. However, the proposed process does not support the level of consolidation necessary to make the rice protocol economically viable for growers to adopt. The protocol and regulations must allow multiple growers to be registered under "one consolidated project" that is represented by one APD, listed as one unique project identification number and should be treated as such in verification. Each individual project/OPO would still be required to gather field data and complete emission reduction calculations on an individual basis.

With regards to the specified verification requirements, the deferred verification schedule within the proposed protocol provides improved flexibility for small projects and does represent some cost-savings for eligible projects. However, the protocol specifies that each project within a consolidated OPDR must be independently verified and that an offset verification statement must be issued for each project. This undermines the potential cost-savings of consolidating projects as it increases the verifiers work particularly if a field visit is required for each project and possibly each of a farmers many fields.

Our suggestion is to allow a single verification to be performed on the consolidated project through the APD, with a desk review for all the fields/OPOs in the consolidate project, and then a sampling approach, based on type of practice data provided and

[16] See C-AGG's proposed approach recognizing that project verifiers already develop Sampling Plans in a transparent and documented manner - the proposed approach relies on the rigor of science to reduce verification costs without sacrificing program integrity.

a verifier's risk assessment, to be used to determine the required field visits. *(TGC-2)*

Comment: Verification is the single largest and most time-consuming cost of developing agricultural offset projects. According to EDF's economic analysis, this cost is typically 50% of the total rice project development cost. In order for the agricultural sector to participate in California's Cap-and-Trade program, risk-based and randomized verification is necessary.

We support the proposed Rice Cultivation Pilot Verification Program, during which traditional verification and risk-based and randomized verification will both be conducted and the results of the two will be compared. The current Cap-and-Trade regulations require a verifier to visit each participating farm every year. This process is time consuming and expensive and will hinder the development of agricultural offsets. We encourage the development of a risk-based and randomized verification procedure which requires the verifier to review the APD's business and data management processes including the types of supporting evidence, evidence collection and evidence storage in order to develop a thorough risk-based sampling plan. In addition, the inclusion of statistically randomized sampling allows for science-based verification. Under this approach, the verifier would develop a verification plan based upon their assessment of the projects risks in much the same way as verifiers currently develop their Sampling Plan as required under section 95977.1(b)(3)(G) of the Cap-and-Trade regulations. This approach is much more cost effective and can demonstrate the reasonable assurance standard required for offset projects.

As a part of risk-based and randomized verification, the verifier would be required to visit the APD's office in order to conduct a thorough review of all processes, procedures, controls, and records for rigor, consistency, and accuracy. The verifier would interview the OPOs in a project depending upon their risk assessment identified through the Sampling Plan. If the Sampling Plan results in an Adverse Offset Verification Statement or a Qualified Positive Offset Verification Statement, the verifier and the APD would have the opportunity to increase the number of OPOs visited in order to determine errors with the report and to generate a Positive Offset Verification Statement. *(EDF-3)*

B-4.2. Comment: Pilot Verification Program: IETA supports cost-effective yet rigorous approaches to verification, while recognizing that verification can lead to the single largest and most resource-intensive cost of developing agriculture protocols. We supported ARB Staff's prior inclusion of a Pilot Verification Program for the Rice Protocol. However, in the protocol's latest draft version, this proposed Pilot has unfortunately been removed. We therefore recommend re-inclusion of the Pilot Verification Program in the Rice Protocol, prior to protocol adoption. The Pilot – funded by ARB and employing two approaches for a 3-year period - would allow for

a comparative assessment of the outcomes of the two verification approaches. Such a comparative analysis, if well designed, will be a valuable and worthwhile initiative, as well as provide foundational information on which to base the development of future updates to the Rice Protocol and the development of additional agricultural protocols into California's Program. *(IETA-2)*

> **Response:** The above comments express concern regarding the requirement that all projects in a consolidated OPDR must be independently verified, as stated on page 20 of the ISOR. The requirement to verify each project independently, including allowing sampling within projects but not across projects, is consistent with the Regulation and the Rice Protocol.
>
> If an individual project is comprised of multiple fields, the fields may be sampled at the verifier's discretion.
>
> ARB did not remove the pilot verification program as the commenter suggests and is still planning to conduct the pilot verification program to explore alternate verification approaches for rice cultivation projects. Discussion of the pilot program was included in the ISOR. It is not a regulatory requirement so it is not included in the text of the Rice Protocol, but is part of implementation

B-4.3. Comment: The design of the Verification Pilot is critically important. EDF encourages the ARB to work with a diverse team in its development, much as it did with the development of the Rice Protocol. We recommend that the team should include a statistician, an agronomist, a grower or grower representative, a scientist from CDFA, a representative from the UC Cooperative Extension, a verifier, and a representative from one of the Offset Project Registries.

The results from this Verification Pilot will be useful in developing specific verification requirements for future agriculture-based projects. We believe that this approach is consistent with the design and intent of the Cap-and-Trade regulations and encourage the development of offset projects from rice producers and allow for greater participation of the agriculture sector in meeting the state's GHG reduction goal. We look forward to additional information on the Verification Pilot Program to be released later this year and will encourage our rice growing partners to apply for the Verification Pilot funding. *(EDF-3)*

Comment: During the last comment period on the Compliance Offset Protocol: Rice Cultivation Projects (draft dated October 28, 2014), a staff report described a Rice Cultivation Protocol Pilot Verification Program, intended to fund the verification of projects using two approaches for a 3 year period. The aim of the Pilot Verification Program was to complete a comparative assessment of these two approaches.

C-AGG urges ARB to work in a transparent fashion with stakeholders and experts from the agricultural and carbon market sectors to design and document the Verification Pilot approach. This will help to ensure that a robust and agreed-upon Pilot Program includes participation of an adequate number of APDs and OPOs to show meaningful outcomes from which a comparative assessment can be developed. It will also ensure that all stakeholders are clear and agreed on the approach and the means by which the comparative assessment will be conducted and future project verification approaches developed. A well designed comparative assessment will be a valuable and worthwhile endeavor, and will provide sound information on which to base the development of updates to the *Compliance Offset Protocol: Rice Cultivation Projects* and other agricultural protocols developed by ARB. As a multi-stakeholder collaborative, C-AGG will commit to constructively engage in any way possible to help develop the design of the Pilot Program and the comparative assessment. *(CAGG-2)*

> **Response:** ARB thanks the commenters for their support of the pilot verification program, and is committed to continue working closely with stakeholders in its development and implementation.

B-5. Project Data Disclosure

B-5.1. Comment: As currently written, the Rice Protocol's full project data disclosure requirement may divulge proprietary or confidential business information. Like most business entities, agricultural producers must protect proprietary and confidential business information from public disclosure. While some of the information collected from individual producers participating in a consolidated Rice Protocol project might be necessary to include in private reports to ARB, the requirement for such data to be made publicly available will lessen or negate the willingness and ability of rice producers to participate. As such, we recommend ARB clearly states that "any proprietary and confidential business information will not be publicly shared at any point". *(IETA-2)*

Comment: The requirement of the proposed Compliance Offset Protocol: Rice Cultivation Projects for full project data disclosure should be revised to protect proprietary or confidential business information (CBI) in order to ensure the willingness and ability of individual producers to participate in rice cultivation offset projects and future agricultural offset projects. As currently written, the requirement for full public disclosure of all data may divulge proprietary or confidential business information (CBI) of agricultural producers. While some of the information collected from individual producers participating in a consolidated Rice Cultivation Offset Project might be necessary to include in private reports to ARB, the requirement for such data to be made publicly available may lessen or negate the willingness and

ability of rice producers to participate in the protocol. C-AGG suggests that ARB state unequivocally that proprietary and confidential business information will not be publicly shared at any point. Additionally, the Protocol and supporting documents should explicitly identify which information this pertains to. *(CAGG-2)*

Comment: We understand the need for transparency for the Rice Protocol, as with all compliance offset protocols. However, this must be balanced with protecting confidential business information. Therefore, we recommend the ARB provide detailed guidance regarding the specific grower information which will be made publically available and which data will be maintained by the ARB. In order to ensure grower participation, it is important to recognize the willingness and ability of growers to protect details of their operation that could be considered confidential business information (CBI). *(EDF-3)*

Comment: On the other hand, we need to be very careful with the disclosure of data. While having project location information is important for making sure one farmer doesn't risk a total project, if confidential business information is made public, farmers will not participate. I'm confident we can find a way to do that through the implementation of this protocol. *(EDF-4)*

> **Response:** ARB disagrees with the suggestions to conceal public data related to the rice projects. All data in the listing and OPDR will remain public; this is a requirement to support transparency in the compliance offset program which is voluntary and not mandate for any entity. The specific information required in the OPDR is stated in subchapter 7.2 of the Rice Protocol.
>
> The above commenters should note that this data would remain public regardless of whether it was published by ARB. For example, Section 95987(b) of the Regulation requires the OPR to make specific information publicly available when a project is listed and when registry offset credits are issued.

B-6. Other

B-6.1. Comment: The Rice Protocol provides a strong foundation for future agricultural protocols. EDF has reviewed the current voluntary offset protocols and based on overall GHG reduction potential, applicability to California, and overall feasibility for project implementation, EDF believes that a nutrient management protocol presents the greatest opportunity as ARB's next offset protocol. EDF is in the process of developing a multi-state, multi-crop nutrient management project which will serve as powerful example of the reduction potential of this protocol.

The Rice Protocol has established a framework that can enable the creation of a Nutrient Management Protocol. A Nutrient Management Protocol built on this framework will supply compliance entities with additional high-quality agriculture-based offsets and could be designed with crop and geographically based modules which will dramatically speed adoption of additional crops and geographies. This protocol could start with a California-based crop such as almonds and be rapidly expanded to include corn, leafy greens, sugar beets and barley. To do this, the Quantification Methodologies chapter would be amended to include the new crop quantification equations. The other chapters, such as Assessment Boundary, Monitoring, Reporting, and Verification would all be written to apply to all applications of fertilizer, regardless of crop. This approach would allow the ARB to expand the protocol without having to enact a separate rulemaking and protocol for each crop considered.

Despite the precedent set by the Rice Protocol, EDF finds itself in a catch-22 with the development of a nutrient management project. ARB staff has indicated the importance of developing several pilot projects to “road test” the protocols. Conversely, farmers have expressed reluctance at investing the time and effort in the development of a pilot project with no indication that ARB will consider this protocol in the future. Both a signal from ARB and a pilot project with issued credits are important milestones. EDF strongly encourages ARB to hold a workshop to discuss broad concepts important to be included in a potential nutrient management protocol to send the critical market signal that the ARB could develop a nutrient management protocol in the future. *(EDF-3)*

> **Response:** Comments related to future development of additional protocols are outside the scope of this rulemaking process, therefore no response is required.

B-6.2. Comment: In addition, specific rules and requirements must be specified for invalidation, such that invalidation could be applied to the consolidated project or to the emission reductions from an individual OPO within the group. It is imperative that partial invalidation in a consolidated OPDR can be supported. *(TGC-2)*

> **Response:** Consolidated projects are not allowed under the protocol or Regulation so it is not necessary to provide clarification on invalidation for consolidated projects. For the consolidated OPDR, because each project will be verified independently, offset credits from a specific project will considered for potential invalidation independently of the remaining projects in the consolidated OPDR.

C. COMPLIANCE OFFSET PROTOCOL FORESTRY PROJECTS

C-1. Support for Inclusion of Alaska into Protocol with Opposition to Other Proposed Protocol Details

C-1.1. Multiple Comments: We do, however, strongly support the proposed 15-day modifications to Sub-Chapter 10, Article 5, sections 95802, 95973, 95975, 95976, 95981, and 95985, including but not limited to inclusion of Alaska into the Forest Protocol and clarification of the treatment of Early Action reforestation projects. *(PFT-2)*

Comment: On behalf of the Chugach Alaska Corporation (Chugach), this is to express our strong support for ARB to adopt the updates to the U.S. Forest Compliance Offset Protocol to include project eligibility in parts of Alaska. Scheduled for hearing on June 26, this important action will allow Alaska Native Corporations, their shareholders and other eligible landowners to participate in the carbon market by developing compliance forest offset projects.

We greatly appreciate the Board's attention to this matter and the great investment of time and resources of the ARB staff to make this important effort a reality. Including project eligibility in Alaska will give Chugach and other landowners an alternative to timber harvest and will reward sustainable forest management and protect important old growth forests. Allowing Alaska forest projects into California's carbon market will contribute to the success of the offset program. Alaska forest carbon offset projects could generate millions of compliance offsets, while achieving social, environmental, and economic benefit to Alaska native and resident populations.

The two largest forests in the National Forest system are located in Alaska. The Tongass National Forest in Southeast Alaska encompasses nearly 17 million acres and the Chugach National Forest in Southcentral Alaska more than 5 million acres. Adjacent to, or within the boundaries of these two large national forests, there exists nearly 1.5 million acres of private lands, predominately owned by Alaska Native Corporations. According to the USDA's Forestry Sciences Lab, the baseline inventory for these southern Alaska forests average between 22 to 30 tons of carbon captured per acre.

When the ARB originally adopted the forest protocol, forest projects in Alaska were made ineligible "due to lack of region-specific data". Region-specific data for the Southcentral and Southeast portions of Alaska is now available, and the proposed update will allow project eligibility in those regions of Alaska.

Chugach is aware of concerns raised regarding even-age management and related provisions. While we share those concerns and encourage further discussion and clarification, we urge that the ARB not delay action on the inclusion of Alaska into

the U.S. Forest Protocol. Removing Alaska's exclusion is long-awaited and should not be delayed.

Thank you for taking action to include project eligibility in parts of Alaska and allow Alaska landowners to participate in California's carbon market. *(CAC-2)*

Comment: Alaska's coastal forests support among the highest standing carbon biomass of any terrestrial ecosystem. Including Alaska will give landowners an alternative to timber harvest, reward sustainable forest management and protect important old growth forests while leveraging GHG emission reductions outside of California. In addition to generating significant GHG reductions, Alaska forest carbon offset projects would also achieve social, environmental, and economic benefits to Alaska Native and resident populations.

When the ARB originally adopted the forest protocol, forest projects in Alaska were made ineligible "due to lack of region-specific data". Subsequently, region-specific data for the Southcentral and Southeast portions of Alaska was formally transmitted to the ARB in 2012; however, the exclusion of forest projects in Alaska has not yet been corrected. Therefore, The Nature Conservancy strongly supports removal of the Alaska exemption, to expand the breadth of GHG reduction opportunities while protecting some of the world's finest forest ecosystems. *(TNC -3)*

Comment: The undersigned groups appreciate the opportunity to provide comments on the California Air Resources Board (ARB) Draft Updates to the Forest Protocol (Draft). We strongly support AB32 and the inclusion of forest-based offsets in California's cap and trade program. We are pleased to see Alaska included in the update and commend the great work of ARB staff in working towards its inclusion. *(SIGLLC-2)*

Comment: As a result of our concerns, we would like to request that ARB maintain the current version of the Protocol, while allowing for the incorporation of qualifying Alaskan forest projects into the program. Ruby Canyon Engineering acknowledges that protocol updates will be desirable and necessary as the ARB program matures; however, we feel that such modifications are not necessary at this time. Thank you for your consideration. *(RCE-2)*

Comment: We do, however, strongly support the proposed 15-day modifications to Sub-Chapter 10, Article 5, sections 95802, 95973, 95975, 95976, 95981, and 95985, including but not limited to inclusion of Alaska into the Forest Protocol, clarification of the treatment of Early Action reforestation projects, and acceptance of the Compliance Offset Protocol for Rice Cultivation. We see no reason to delay these changes. *(SPI-3)*

Comment: As part of ARB's Cap and Trade Program, Compliance Offsets play a critical role in reducing emissions in non-capped sectors while providing compliance

flexibility and cost containment for regulated entities. The Forest Protocol has been very successful so far, building off wide use and testing as a voluntary mechanism. The Forest Protocol not only generates real, additional, quantifiable and durable offset credits; it assures the conservation and sustainable management of forests to very high standards for wildlife habitat, watershed values and sustainable rural communities. Its beneficial environmental impact is not limited to California but increasingly across the U.S., often where there are few if any forest practice regulations constraining timber harvest or forest conversion. The Forest Protocol is a model for the rest of the country and the world, demonstrating how to harness the biological power of forest carbon sequestration in an approach that is both rigorous and practical.

We recognize the considerable investment of ARB staff in managing the demands of the growing Compliance Offset Program and in preparing the proposed set of amendments to the Forest Protocol. We are grateful for their sincere efforts to ensure the integrity of the resulting offsets issued.

… At the same time, we do strongly support the proposed 15-day modifications to SubChapter 10, Article 5, sections 95802, 95973, 95975, 95976, 95981, and 95985, including but not limited to inclusion of Alaska into the Forest Protocol, clarification of the treatment of Early Action reforestation projects, and acceptance of the Compliance Offset Protocol for Rice Cultivation. We see no reason to delay these changes.

We commend ARB for its work on behalf of all Californians to achieve the goals of AB32 and reduce dangerous levels of greenhouse gases. We look forward to continuing to work with you to ensure that the forest sector is a resilient source of emissions reductions. *(PFT-3)*

Comment: We appreciate the opportunity to speak on this issue. And we do strongly adopt – support the adoption of the rice protocol and the inclusion of Alaska in the forest protocols. We think they're both important for expanding the breadth of reductions that we're able to achieve both in California and even beyond California, and they also help advance conservation and other public benefits.

We appreciate the hard work that staff has dedicated to clarifying certain items in the forest protocol as well. *(TNC-4)*

Comment: So with that, we would -- we do fully support this program. We think it's a great program. We support the inclusion of Alaska into this program. And I respectively request that you consider making those technical changes. *(GDRC-4)*

Comment: And I wanted to thank the Board for considering Alaska's inclusion in this protocol, and particularly on behalf of the native peoples of Alaska.

The Tlingit, Haida, Tsimshian peoples of southeast Alaska, their land management ethic really parallels in a lot of ways this forest offset protocol. They really are enthusiastic about the opportunity to participate. And we really wanted to thank you for that opportunity.

… So just to conclude, I would really urge the Board to please consider and take action to include Alaska in the protocol today. *(SEA-1)*

Comment: We are also excited about the inclusion of Alaska along with the adoption of the rice protocol. I want to dovetail though some of the comments that have already been made, and kind of focus on the process a little bit. *(BLUESOURCE-4)*

Comment: IETA supports ARB's efforts to issue forest protocol updates as California's offset program matures and forest conditions change. But we believe major protocol modifications, particularly at this stage in the program's infancy are both risky and unnecessary.

We are concerned that many of ARB's proposed revisions could adversely affect California's still nascent offset market, shaking confidence, particularly that of landowners, lowering participation, and reducing future volumes to an already constrained market.

IETA therefore requests ARB strongly consider maintaining the current version of its compliance forest protocol while allowing the incorporation of eligible Alaskan forest projects into the California program.

California's forest protocol is critically important, so we should take the time to get it right. These offsets are not only about cost containment enabling linkages and climate benefits. They also generate substantial environmental co-benefits. *(IETA-3)*

Comment: We applaud the ARB's leadership in implementing AB 32 as an effective model for the rest of the nation and the world. PFT has been a long-time partner with you in seeking to harness the climate benefits of forests to meet the State's ambitious greenhouse gas reduction goals.

In fact, the ARB's forest protocol has been the centerpiece of the offset program. These real durable emissions reductions also ensure conservation and sustainable management of forest's very high standards for wildlife habitat, watershed values, and sustainable rural communities, not only in California, but across the country, ten states and counting.

We commend you and your staff for these achievements. And I want to note we are very supportive of the inclusion of Alaska in the program. It seems like a perfectly normal and appropriate expansion, and the very welcome news that there will be

more action for the early action projects, so we can catch up and do justice for those that have taken the most risk on behalf of the offset program.

However, the success of the forest protocol in this initial period leads me to question the need for any material changes so soon in the process. We've only just gotten under way. And while there have been improvements to the language in the proposed set of changes since they were first presented, unfortunately PFT continues to share the view of many environmental organizations, verifiers, forest owners, and project developers that some of this new language still adds, rather than reduces, complexity, ambiguity, and confusion without enhancing environmental values or stringency. *(PFT-4)*

Comment: First, I'd like to state our strong support for the new rice protocol, and addition of Alaska into the existing U.S. Forestry Protocol. *(PGE-3)*

Comment: We recommend that ARB today adopt the proposed 15-day package version of the forest offset protocol without proposed amendments for even-aged management requirements. Those are sections 3.1(a)(4), A through D, and without the proposed amendments for modification to minimum baseline calculation for IFM -- for IFM projects. That's Section 5.2.1(d). *(ACR-5)*

Comment: Chugach Alaska Corporation strongly supports the staff's recommended update of the U.S. Forest's compliance offset protocol to include project eligibility in parts of Alaska, and urges the Board to take action today to approve the staff's recommendation. Much time has passed, much effort expended to reach where we are today, and frankly it's time to move forward.

Approval will facilitate Chugach Alaska Corporation and other Alaska native corporations, one you've heard from just today, to participate in the California carbon market through developing of compliance forest offset projects, something Chugach has been looking to do since the inception of the California program.

Alaska forest project developments will not only contribute significant amounts of core -- of carbon offsets to the California market, but will help sustain these magnificent Alaska forests, reward sustainable forest management practices, protect old growth forests, and in so doing help achieve social, environmental, and economic benefits for Alaska native populations.

The two largest forests in the U.S. national forest system are located in Alaska, one being the Chugach National Forest of more than five million acres.

The Chugach would like to express its thanks to the staff for all their help and hard work over these many months in reaching their recommendation to include Alaska regions in the program and look forward to continued work with the staff as the Chugach folks work to bring projects to fruition.

But if I might add a personal note, if not a note just barely mentioned in the Chugach letter, Chugach was so grateful to get into the program. And in recognizing that there were problems with the program, nonetheless said move forward today. *(CAC-3)*

Comment: Aside from the forest protocol -- well, along with the forest protocol, we are very supportive of the inclusion of Alaska into the program. And I hope that soon Hawaii will also be up before you. I know that we are working with others, including ARB staff, to get the data to together, so that will be coming to you some day in the future. *(CAR-3)*

Comment: We ask you today to vote in favor of offset supply, to vote in favor of the rice protocol, and to vote in favor of including Alaska in the forestry protocol. We also ask you to reconsider these technical changes that so many people have raised with serious concerns. These are very technical, but they are very important. They have the potential to discount the forestry market by 40 to 60 percent.

So, in fact, making this kind of a change is something that we should do with caution. So we simply ask that you try to do the right thing, make the right decision today by allowing people who have that technical expertise to have the input.

And today, what we would like to raise is just simply to support the rice protocol and the Alaska protocol in your deliberations. *(CHEV-1)*

Comment: As you've seen, there's a diverse set of stakeholders in this room that share mutual concern with regards to the technical provisions of the update to the U.S. Forestry Protocol, while at the same time supporting the rice cultivation protocol and the inclusion of Alaska.

We echo those concerns and would support some of the recommendations with regards to perhaps splitting the question today, adopting the rice protocol as well as the inclusion of Alaska… *(CCEEB-2)*

Comment: We recognize that protocol updates are both desirable and necessary as California's offset program matures and forest conditions change. However, we believe that major protocol modifications – particularly at this stage of the program's infancy – are both risky and unnecessary. As such, IETA requests ARB to strongly consider maintaining the current version of its compliance Forest Protocol, while allowing for the incorporation of eligible Alaskan forest projects into California's program. *(IETA-2)*

> **Response:** ARB appreciates the support of the above commenters regarding inclusion of Alaska in the protocol. Many commenters express general opposition to other technical revisions; specific comments regarding these technical revisions are addressed in the following sections of this document. Several commenters also indicate that it is too early in the

program to modify the Forest Protocol. ARB staff would like to note that it has been almost five years since the Board originally adopted the Forest Protocol in 2011 which was based on the Climate Action Reserve protocols developed even prior to that. New data and insight from the first years of implementing the compliance offset program made updates essential to the accurate quantification and improved implementation of the protocol. ARB staff has updated two of the other four protocols originally adopted by the Board in 2011 for the same reasons.

The commenters are also concerned the proposed changes to the Forestry Protocol will result in reduced offset supply. While offset supply is an important factor, assuring that all ARB offsets represent real, permanent, quantifiable, verifiable, enforceable, and additional GHG emission reductions and GHG removal enhancements is also important. ARB has taken several steps to address offset supply concerns. In addition to the four originally approved protocols in 2011, ARB has added a Mine Methane Capture offset Project Protocol, is proposing to add a Rice Cultivation Projects Protocol, and extend the geographic scope of the current Forest Protocol to include Alaska. ARB staff will continue to evaluate and propose new offset protocols that will generate compliance offset credits that meet AB 32 criteria. It is also important to note that there is no indication that all possible projects have been implemented under the existing protocols. Offset projects are price-responsive. If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, ARB staff expects that project developers will respond by undertaking more projects with the expectation of higher returns on investment. Therefore, the proposed changes would not substantially affect offset supply

C-2. General Opposition to Proposed Protocol

C-2.1. Multiple Comments: We urge ARB to remove from consideration three portions of the proposed update, and associated definitions, to allow further refinement of the language to better address the complex technical issues involved.

1. Modified Even-aged Management requirements – Chapter 3.1(a)(4)(A-E)

2. Modified Minimum Baseline Level determination process for IFM projects with initial stocking above common practice – Chapter 5.2.1

3. Modified Common Practice figures and the associated shift in “high” vs “low” site class delineation - Assessment Area Data File associated with the Regulatory Review

Update of the Forest Protocol and Appendix F (d)

There are numerous unresolved and highly technical issues with the proposed changes both in terms of clarity and substance. If adopted, these changes will detrimentally affect the viability of the Forest Protocol as an effective tool, leading to inaccurate quantification, disincentives for conservation of carbon rich forests, increased uncertainty, and decreased participation by forest landowners across the U.S. Further, varying and conflicting interpretations of the proposed language will add a significant burden to ARB staff time, project developers and verifiers for resolving project-specific issues in the course of verification.

It is critical that any changes to such a multi-faceted and technical set of regulations as the Forest Protocol be undertaken with great care and consideration, drawing on the necessary expertise as done with the original protocol. Further, at this still early stage of the offset program, it is also very important to provide certainty and consistency for participants, who are making considerable investments over many years to develop projects and provide offsets to the Cap and Trade Program. *(PFT-2)*

Comment: The California Forestry Association (Calforests) is concerned that the proposed amendments to the U.S. Forest Protocol fell short of simply adding clarity to the existing Protocol. Calforests have joined many other organizations in a letter requesting removal from consideration three portions of the proposed U.S. Forest Offset Protocol update and associated definitions. *(CFA-3)*

Comment: We recommend ARB adopt the proposed 15 day package version of the forest offset protocol without the proposed amendments related to even aged management requirements and minimum baseline requirements for projects with stocks above common practice. As described in the Appendix of this letter, these proposed amendments will have significant impacts on the market. Delayed approval of these two sections will allow sufficient time for the current pipeline of projects to enter the market.

…Given the nascent state of the California Program, we encourage ARB to continue its efforts to assure that the rules underpinning the ARB offset system are stable and will not be subjected to frequent and unpredictable modification. To avoid both a loss of program confidence and a significant decline in supply in an offset program that is already anticipated to be short, we propose that ARB delay adoption of the two sections that are described in this letter (see Appendix). We believe that the protocol currently contains sufficient stringencies and safeguards to ensure sustainable and natural forest management and encourage enhanced stewardship of forestlands across the country. *(ACR-3)*

Comment: SPI joined many other organizations in a letter requesting removal from consideration three portions of the proposed US Forest Offset Protocol update, and associated definitions, to allow further refinement of the language to better address the complex technical issues involved.

We urge the Board to remove the three sections and associated definitions identified in the joint letter and urge the staff to conduct additional workshops to get these issues right. The California Forest Practice Rules and Act already provide the most stringent environmental protection of forests found anywhere in the country, while a laudable goal to encourage other jurisdictions to come up to these standards, we need to get them right and not inadvertently cause unnecessary and importantly costly increases in project development such that land owners are dis-incentivized to participate. *(SPI-3)*

Comment: We urge ARB to remove from consideration three portions of the proposed update, and associated definitions, to allow further refinement of the language to better address the complex technical issues involved.

1. Modified Even-aged Management requirements – Chapter 3.1(a)(4)(A-E)
2. Modified Minimum Baseline Level determination process for IFM projects with initial stocking above common practice – Chapter 5.2.1
3. Modified Common Practice figures and the associated shift in “high” vs “low” site class delineation - Assessment Area Data File associated with the Regulatory Review Update of the Forest Protocol and Appendix F(d)

There are numerous unresolved and highly technical issues with the proposed changes both in terms of clarity and substance. If adopted, these changes will detrimentally affect the viability of the Forest Protocol as an effective tool, leading to inaccurate quantification, disincentives for conservation of carbon rich forests, increased uncertainty, and decreased participation by forest landowners across the U.S. Further, varying and conflicting interpretations of the proposed language will add a significant burden to ARB staff time, project developers and verifiers for resolving project-specific issues in the course of verification.

It is critical that any changes to such a multi-faceted and technical set of regulations as the Forest Protocol be undertaken with great care and consideration, drawing on the necessary expertise as done with the original protocol. Further, at this still early stage of the offset program, it is also very important to provide certainty and consistency for participants, who are making considerable investments over many years to develop projects and provide offsets to the Cap and Trade Program. *(SPI-3)*

Comment: However, CCEEB has significant concerns with a number of the other proposed changes to the Compliance Offset Protocol for U.S. Forest Projects and

requests that consideration of certain language be extended. The Board should not vote to approve these modifications at this time. *(CCEEB-1)*

Comment: All of the previous comments above were raised prior to the December 2014 board hearing. While the Board has made some changes to the definition of even-aged management since then, none of the remaining items were addressed, nor has the Board responded to our comments. While we understand that the Board receives numerous comments, these are items that numerous other stakeholders are concerned about, as well.

Rather than adopting the problematic changes highlighted above, we urge the Board to direct staff to organize a technical work group process to allow for a more robust discussion of proposed amendments to the Forest Protocol and produce language that more accurately and efficiently addresses the perceived matters of concern. *(ECOP-2)*

Comment: We, along with 15 other companies and organizations, have signed on to a group letter proposing that ARB delay adoption of three key areas of the proposed update and direct staff to organize a technical work group process to allow for a more robust discussion of the complex technical issues involved, including amendments that seek to mirror the California Forest Practice Rules promulgated by the Board of Forestry. *(NFI-3)*

> **Response:** ARB staff disagrees that updates to the Common Practice values, minimum baseline determination/LMU definition, and even-aged management subchapter should be delayed or removed. More detailed responses regarding each of these areas can be found below. ARB staff has determined that all these modifications are essential to assuring all ARB offset credits issued as a result of the Forest Protocol are real, additional, permanent, quantifiable, verifiable, and enforceable as required by AB 32. ARB staff worked with stakeholders, The FIA, the Board of Forestry, and the Department of Forestry and Fire Protection to address many of the concerns in these three areas and proposed modifications as part of the 15-day changes proposed to the Forest Protocol.

C-2.2 Comment: I'd like to recognize the work that the staff has done, and I understand -- and we understand the need to update the protocol for U.S. forest projects. However, we're concerned that the proposed changes will inhibit the continued growth of this sector.

In short, The Climate Trust believes that several of the proposed technical changes will limit the willingness and ability of landowners to develop forest carbon projects. And this is particularly true for states outside of California. *(TCT-2)*

Response: Without additional information it is difficult the respond to the concerns of the commenter. ARB staff made modification to the Forest Protocol to provide additional clarity and easily verifiable standards. Modifications were based on new and better data, and lessons learned during the first few years of implementing the protocol. The new protocol is more scientifically rigorous, technically correct and verifiable then previous versions. Additionally, the more precise standards place all projects on a level playing field, in-state or out-of-state.

Offset projects are price-responsive. If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, ARB expects that project developers will respond by undertaking more projects with the expectation of higher returns on investment.

C-2.3. Comment: My basic message for you is that if, in fact, offsets from the forest sector are important in the overall goals of the Cap-and-Trade Program, that one needs to be very cognizant of the willingness of forest landowners around the country to willingly and voluntarily decide to engage in the form of a project. And that any changes that disincent forest landowners from participating, run counter to the overall objectives of the Cap-and-Trade Program.

And it's my conclusion, based upon my experience doing this kind of work for many years, that the changes being considered now will serve as a very strong disincentive for forestland owners outside of California to voluntarily decide to engage and develop projects to create offset credits that can be used in the Cap-and-Trade Program.

For that reason, I urge you to reconsider the action before you. *(SCS-4)*

Response: ARB staff established standards that treat all projects, in-state or out-of-state, equitably. Offset projects are price-responsive. If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, ARB expects project developers will respond by undertaking more projects with the expectation of higher returns on investment.

C-2.4. Comment: I'm here today to voice my concern the consequences the proposed changes to the U.S. Forest protocol would have on the program. Three proposed updates, the calculation of the minimum baseline level, the restrictions on even-age management, and the updates to the common practice values will have the effect of increased development and verification costs, while simultaneously decreasing potential credit generation.

With increasing costs and decreasing benefits, the proposed changes effectively reduce forest owner eligibility and thus participation. We all recognize the value this

protocol plays in forest conservation, the management of health and sustainable forests, as well as air quality improvement.

I ask the Board to consider these consequences in your decision. We support the other proposed changes to the protocol. However, we are concerned that these three changes will significantly hurt future participation in the program. Thank you, and we look forward to continuing to work with ARB staff in the future. (*ECOP-3)*

> **Response:** ARB staff disagrees that updates to the Common Practice values, minimum baseline determination/LMU definition, and even-aged management subchapter should be delayed or removed. More detailed responses regarding each of these areas can be found elsewhere in this document. ARB staff has determined that the current proposed modifications are essential to ensuring all ARB offset credits issued as a result of the Forest Protocol are real, additional, permanent, quantifiable, verifiable, and enforceable as required by AB 32. ARB staff worked with stakeholders, FIA, the Board of Forestry, and the Department of Forestry and Fire Protection to address many of the concerns in these three areas and other proposed modifications in the 15-day protocol.
>
> If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, ARB expects project developers will respond by undertaking more projects with the expectation of higher returns on investment.

C-3. Stakeholder Process

C-3.1. Multiple Comments: Rather than adopting the problematic changes highlighted above, we urge the Board to direct staff to organize a technical work group process to allow for a more robust discussion of proposed amendments to the Forest Protocol and produce language that more accurately and efficiently addresses the perceived matters of concern. This is consistent with the use by ARB of technical work groups to draft the Rice Cultivation Protocol and the Climate Action Reserve's Forest Project Protocol 3.2, which served as the basis for the Forest Protocol. *(PFT-2)*

Comment: IETA is concerned about the method by which ARB proceeded with proposed modifications to the Forest Protocol. We believe the protocol modification process was neither transparent nor consistent with ARB's typically high standard of stakeholder communications and engagement. During the Forest Protocol updating process, ARB only hosted one stakeholder workshop to briefly discuss proposed amendments to the Forest Protocol (among a host of other protocol and program design matters). As a result, many of the protocol's latest proposed amendments

are considered problematic and impractical, particularly for forest owners outside of California. This situation could have been avoided, if a large and diverse collection of experts and stakeholders had been consulted earlier by ARB. *(IETA-2)*

Comment: To remedy the situation and address process problems, we recommend that ARB pursue a Forest Protocol engagement approach similar to that used for the Rice Protocol. This approach would see ARB gather a broad range of forestry, market, industry, NGO and technical experts to share focused communications and protocol options/impact views with ARB staff. The transparent, multisector process would occur along a clear and established timetable.

Going forward, we believe that all protocol updates, including those linked to Forest Protocol revisions, should be carried-out in accordance with clear and well-circulated timetables, and they should involve a rigorous process of stakeholder consultation. *(IETA-2)*

Comment: It is important the process of protocol modifications be done transparently and within the protocol, bringing in the necessary stakeholder expertise, as was present in the development of the protocol, to ensure the changes are practical. Participants make substantial investments over many years to provide offsets to the Cap and Trade Program. *(SIGLLC-2)*

Comment: Projects developed under the Forest Protocol take years to implement and generate offsets, with considerable investment in advance by project owners and developers. Landowners are preparing to make a 100 year commitment. Material changes to the Forest Protocol such as proposed need to be undertaken with greater care and consideration to ensure that its goals continue to be met and projects can be feasibly developed.

The process for development of the current proposed amendments has also been inefficient for all concerned and has not adequately engaged technical expertise available from the stakeholders and elsewhere. It is not a good model for the future. The creation of a technical work group would help ARB staff now and in the future to continue refinements to the Forest Protocol.

Therefore, we ask ARB to remove from current consideration three portions of the proposed update, and associated definitions, to allow further refinement of the language by a technical work group that the Board should direct staff to convene so as to better address the complex technical issues involved and ensure that there are not unintended environmental consequences.

1. Modified Even-aged Management requirements – Chapter 3.1(a)(4)(A-E)
2. Modified Minimum Baseline Level determination process for IFM projects with initial stocking above common practice – Chapter 5.2.1

3. Modified Common Practice figures and the associated shift in “high” vs “low” site class delineation - Assessment Area Data File associated with the Regulatory Review Update of the Forest Protocol and Appendix F(d)

Further, PFT strongly urges ARB to create a clear and explicit process for updating the Forest Protocol, including the Common Practice values, on a regular basis with the assistance of a standing technical work group. *(PFT-3)*

Comment: And while we agree that periodic offset protocol updates are important to improve clarity, consistency and workability, we believe that updates beyond technical clarifications and guidance should be conducted on a regular, approved, fully public and predictable schedule consistent with the phases of the Cap-and-Trade program. In this case, substantive technical changes to the forestry offset protocol are being proposed by staff only two and a half years into the program, when forest landowners, project developers and investors are still gaining foundational knowledge, experience and confidence. *(ACR-3)*

Comment: Beyond the premature nature of these substantial protocol revisions, the method through which protocol modifications were established is problematic. The protocol update process has largely been carried out behind closed doors and is inconsistent with ARB’s typical standard for stakeholder involvement. In the course of the Protocol update process, only a single workshop was held that touched on the Forest Protocol update, and during this workshop (which also addressed the rice protocol and a series of other topics) only ~30 minutes were dedicated to forestry issues. While we recognize ARB staff limitations and applaud the substantial effort staff has committed to the protocol revision process, we believe a more robust consultation within a technical work group process will 1) result in a better set of enhancements to the forest protocol and 2) ultimately reduce ARB staff time that we anticipate will be needed to clarify points of confusion for landowners, project developers, verifiers, and registries if the existing language in these 3 areas of concern are not removed and placed in a work group process. *(BLUESOURCE-5)*

Comment: Further, we suggest that the items highlighted in the Appendix go into effect only after a sufficient period of time has passed to realize the substantial investments that were made in projects under the program and protocol rules that were in effect at the time the investment was made. This would imply that stakeholders have at least two years notice from Board approval to when protocol changes go into effect or within a minimum time period from any previous substantial protocol updates. *(ACR-3)*

> **Response:** ARB staff has used technical workgroups in the past and will continue to use technical workgroups in the future. However, during the development of the current proposed update to the Forest Protocol, ARB staff felt that workshops/webinars and direct interaction with stakeholders was a

more beneficial method for developing these modifications. ARB staff worked with stakeholders, FIA, the Board of Forestry, and the Department of Forestry and Fire Protection to develop the updates to the Forest Protocol. ARB staff conducted an extensive public process to develop the proposed protocols including three public workshops beginning in March of 2014, and a webinar on updates to the U.S. Forest protocol. The list below provides details on the public process:

- March 28, 2013: Public Workshop on Addition of New Offset Protocols (first notice of new Rice Protocol))
- August 19, 2013: Offset Protocol Workshop (Rice Protocol)
- March 17, 2014: Public Workshop on Proposed Rice Cultivation Offset Protocol and Updates to Existing Offset Protocols (Rice Protocol and first notice of updates to Forest Protocol including new Common Practice values)
- June 20, 2014: Proposed Rice Cultivation Offset Protocol and Updates to Existing Offset Protocols Workshop (Rice and Forest Protocol)
- July 29, 2014: Public release of 45-day regulatory package for proposed updates to the Forest Protocol (allowed for 45 days of public comment)
- September 18, 2014: Public Board Hearing to consider updates to the Forest Protocol (including public comment opportunity)
    - At this Board hearing, ARB staff was directed to not move forward with the changes to Common Practice values and the minimum baseline equation, but instead, provide additional time for stakeholders to review these changes, and bring them back to the Board in the next set of updates to the Forest Protocol
- October 2, 2014: Public release of 15-day regulatory package for proposed updates to the Forest Protocol (allowed for 15 days of public comment)
- October 14, 2014: Public webinar with ARB staff and U.S. Forest Service staff to detail the changes to the protocol with a focus on Common Practice values.
- October 28, 2014: Public release of 45-day regulatory package for the proposed updated Forest Protocol and the new Rice Protocol (allowed for 45 days of public comment)
- December 18, 2014: First Board hearing to consider the proposed updated Forest Protocol and new Rice Protocol (including public comment opportunity)
- February 20, 2015: Workshop on Proposed Compliance Offset Protocol for Rice Cultivation Projects and Update to Existing U.S. Forest Protocol

- May 20, 2015: Public release of 15-day regulatory package for the proposed updated Forest Protocol and the new Rice Protocol (allowed for 15 days of public comment)
- June 25, 2015: Final Board hearing to consider the proposed updated Forest Protocol and new Rice Protocol (including public comment opportunity)

In addition to the opportunities for public engagement listed above, ARB staff met with numerous stakeholders individually over the course developing the proposed rulemaking package during the past two years. ARB staff listened to the concerns and recommendations of stakeholders and where appropriate made modifications to the protocols. Where modifications were not appropriate, the rational for not making the changes is presented in rulemaking documents.

ARB adopted the original protocols under the authority given to ARB by the Legislature, codified in Health & Safety Code section 38510, which specifically gave ARB the authority and responsibility to regulate and monitor emissions of greenhouse gases. The Legislature further gave ARB the sole authority to "adopt regulations *to verify and enforce any voluntary greenhouse gas emission reductions* that are authorized by the state board for use to comply with greenhouse gas emission limits *established by the state board*." (Emphasis added.) Comments indicate that a delay is necessary for further consultation and that further consultation is necessary. However, the Legislature vested ARB with rulemaking authority that does not require a particular process beyond ARB's typical APA compliant rulemaking process.

ARB adopted the original protocols and subsequent versions in accordance with the APA (California Government Code section 11340 *et seq.*). Under the APA, ARB must consider the comments and suggestions provided by stakeholders in the rulemaking process. ARB is also required to respond to relevant comments received, explaining what changes (if any) were made in response to the comment. If no changes were made, an explanation of why the suggestion was not taken is also required. These responses are compiled in the Final Statement of Reasons (this document).

Courts have consistently upheld ARB's authority to exercise its discretion in implementing the protocols. Most recently, the First District California Court of Appeal, citing *Association of Irritated Residents*, reiterated that "the directives imposed on the Board by the 2006 Act [AB 32] are all 'exceptionally broad and open-ended,' leaving 'virtually all decisions to the Board…' Citing *Association of Irritated Residents v. California Air Resources Board*, (2012) 206 Cal.App.4th 1487 at p. 1495.) We agree with that conclusion." (*Our*

Children's Earth Foundation v. California Air Resources Board, (2015) 234 Cal.App.4th 870, 888.)

Several commenters also indicate that it is too early in the program to modify the Forest Protocol. ARB staff disagrees, and would like to note that it has been almost five years since the Board originally considered the Forest Protocol in 2010, which was based on the Climate Action Reserve protocols developed prior to that. New data and insight gained from the first years of implementing the Compliance Offset Program made updates essential to the accurate quantification and improved implementation of the protocol. ARB staff has updated two of the other four protocols originally adopted by the Board in 2011 for the same reasons.

C-3.2. Comment: The ARB chose to delay adoption of the new CP values in order to seek stakeholder involvement in reviewing the proposal. Unfortunately, CCEEB and many other stakeholder organizations do not believe that an appropriate engagement process was pursued. As a result, numerous unresolved and highly technical issues with the proposed changes, both in terms of clarity and substance, remain. *(CCEEB-1)*

Response: The commenter states that they do not believe an appropriate stakeholder engagement process was pursued. Please refer to Comment C-3.1 for ARB's response to concerns regarding stakeholder process.

ARB staff disagrees that updates to the Common Practice values should be delayed or removed. More detailed responses regarding each of these areas can be found below. ARB staff has determined that updates to the Common Practice values are essential to ensuring all ARB offset credits issued as a result of the Forest Protocol are real, additional, permanent, quantifiable, verifiable, and enforceable as required by AB 32.

C-3.3. Comment: We agree that periodic offset protocol updates are important. However, we believe that updates should be conducted on a regular, approved, fully public, and predictable schedule. In this case, substantive technical changes to the forestry offset protocol are being proposed for approval only two and a half years into the program, when forestland owners, project developers, and investors are still gaining foundational knowledge, experience, and confidence.

It's important to note that since the launch of the program in January 2013, only eight compliance offset -- compliance forestry offset projects have received our bucks. This is due to the uniquely time-consuming nature and substantial upfront investments required for forest carbon offset project origination, contracting, development, registration and verification.

We recommend to the Board that significant amendments to protocols be conducted on a published and predictable time frame aligned with the phases of the program and with broad stakeholder input. This would allow forest landowners to plan their investments and better manage risk, enabling them to continue to deliver high-quality, low-cost offsets that allow California to put a price on carbon pollution without hindering the economy.

We further recommend the delayed adoption of the amendments for even-age management requirements and minimum baseline calculation for IFM projects. With regard to these specific technical areas, we collaborated with the Climate Action Reserve and industry to develop and propose to ARB alternative language to improve workability of these requirements, while ensuring integrity.

We would like to request that these proposals be considered by staff. Delayed approval of these two technical amendments will provide an opportunity for stakeholder input and improvement from technical experts, while also allowing sufficient time for the current pipeline of projects in which investments have been made to enter the market and provide needed offset supply. *(ACR-5)*

> **Response:** The commenter has indicated that it is too early in the program to modify the Forest Protocol. ARB staff would like to note that it has been almost five years since the Board originally considered the Forest Protocol in 2010, which was based on the Climate Action Reserve protocols developed even prior to that. New data and insight from the first years of program operation made updates essential to the accurate quantification and improved implementation of the protocol. Staff has updated two of the other four protocols originally adopted by the Board in 2011 for the same reasons.
>
> The commenter also had concerns about the timeframe and stakeholder input. The development of many of the changes occurred over a two year extensive public process to develop the proposed protocols including public workshops, working group meetings, and a webinar on updates to the U.S. Forest protocol. The list in ARB's response to Comment C-3.1 provides details on the public process.
>
> ARB staff disagrees that updates to the minimum baseline determination for IFM projects and even-aged management subchapter should be delayed or removed. More detailed responses regarding each of these areas can be found below. ARB staff has determined that all these modifications are essential to assuring all ARB offset credits issued as a result of the Forest Protocol are real, additional, permanent, quantifiable, verifiable, and enforceable as required by AB 32.

C-3.4. Multiple Comments: The second issue we have concerns the offset protocol changes and recommends some solutions. We are concerned that protocol -- we understand that protocol reviews must be predictable and transparent with responsible -- with reasonable timelines between reviews and updates. Changes in protocols or changes within compliance periods should be avoided, as these changes tend to disrupt the offsets supply and demand balance, and undermine market confidence in offsets generated pursuant to complicated protocols.

We support -- again support the program, and we look forward to working with staff in the future. *(WSPA-2)*

Comment: While we share the goal of achieving a robust and liquid offset market, we write to express our serious concern that the process to amend the Compliance Offset Protocol for U.S. Forestry Projects did not adequately evaluate the impact to the offset market, nor were the implications fully acknowledged by staff, discussed with stakeholders, or communicated to the Board. As a result, these changes could unintentionally reduce the already short supply of offsets. We strongly support efforts to ensure the integrity of offsets and believe modifications to the protocols can be conducted without introducing additional regulatory uncertainty. A more robust understanding of the impact of even minor changes should be a priority of protocol revisions. *(BPAI-1)*

Comment: Periodic review and update of the protocols is essential to ensuring the continued environmental integrity of the offset program. We urge CARB to carry out these activities in a predictable, planned and transparent manner that is clearly communicated to stakeholders well in advance and that takes into account the input of experts, regulated parties and other stakeholders. To limit the regulatory uncertainty inherent in such activities, CARB should establish a clear process and timeline for such activities. As part of the process, we also ask that CARB thoroughly evaluate the impacts of proposed changes to avoid unintentionally and unnecessarily jeopardizing offset supply. Changes without sufficient notice or within compliance periods should be avoided in order to allow supply and demand balances within phases to be predicted with reasonable confidence. *(BPAI-1)*

Comment: Periodic review and update of the protocols is essential to ensure the continued environmental integrity of the offset program. Moving forward, we urge CARB to carry out these activities in a predictable, planned, and transparent manner that is clearly communicated to stakeholders well in advance and that takes into account the input of experts, regulated parties, and other stakeholders. To limit the regulatory uncertainty inherent in such activities, ARB should establish a clear process and timeline for such activities. As part of the process, we also ask that ARB thoroughly evaluate the impacts of proposed changes to avoid unintentionally and unnecessarily jeopardizing offset supply. Changes without sufficient notice or

within compliance periods should be avoided in order to allow supply and demand balances within phases to be predicted with reasonable confidence. *(CCEEB-1)*

> **Response:** ARB's response to comments related to the public process ARB undertook to develop the current proposed update to the Forest Protocol and the timing of the current proposed updates can be found in ARB's response to Comment C-3.1.
>
> The commenters are also concerned the proposed changes to the Forestry Protocol will result in reduced offset supply. While offset supply is an important factor, assuring that all ARB offsets represent real, permanent, quantifiable, verifiable, enforceable, and additional GHG emissions reduction and GHG removal enhancements is also important. ARB has taken several steps to address offset supply concerns. In addition to the four originally approved protocols in 2011, ARB has added a Mine Methane Capture offset Project Protocol, is proposing to add a Rice Cultivation Projects Protocol, and extend the geographic scope of the current Forest Protocol to include Alaska. ARB staff will continue to evaluate and propose new offset protocols that will generate compliance offset credits that meet AB 32 criteria. It is also important to note that there is no indication that all possible projects have been implemented under the existing protocols. Offset projects are price-responsive. If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, ARB staff expects that project developers will respond by undertaking more projects with the expectation of higher returns on investment. Therefore, the proposed changes would not substantially affect offset supply.

C-3.5. Multiple Comments: Six months ago, we suggested to the Board and to this offset staff that you utilize the technical work group or a portion of it that Climate Action Reserve used several years ago that built the forestry protocol from scratch. That didn't happen.

And we'd also pointed out to staff that several years ago, Chair Nichols, you forged an agreement with CalFire to utilize their forestry expertise for ARB matters when appropriate. That didn't happen either.

And the result is the staff did not have the forestry expertise to get the language right, so we ask as you move forward to consider through resolution that you direct staff to either use a technical work group for future changes, or if you don't want to do that, at least direct them to use the agreement you have with CalFire to get the forestry expertise that's needed to get the language right, so that there's clarity for efficient and effective implementation of the forest protocol. *(CFA-4)*

Comment: We are also concerned that the questionable level of stakeholder participation in developing these proposed changes only serves to reinforce the perception that environmental markets are highly vulnerable to policy change, and therefore have high investment risk.

The Climate Trust strongly urges ARB to form a technical committee and use the expertise here to provide guidance on the proposed changes to U.S. Forest protocols. *(TCT-2)*

Comment: I think we've heard a little bit that I think the sentiment is -- from ARB staff is that the processes -- they've run through the process and have done so pretty well. I would like to suggest that this process could be greatly improved.

And one key area would be around inclusion of a technical working group. This has come up earlier, but I really want to emphasize this. There were comments that were made around liaising with other agencies, but I think it was just a missed opportunity to not engage folks, registries, verifiers, landowners, other stakeholders that are living and breathing this to be able to comment on it earlier on in the process.

I think the process as it exists right now is that staff that has too much on their plates that are behind on review of projects are also responsible for crafting updates to this regulation, to this protocol. They've made mistakes. The language is not where it needs to be, and that is something that has been supported by Calforests, Pacific Forest Trust. Twelve other stakeholders have signed on to a letter saying they haven't gotten it right yet, but yet today you're deciding on whether you're going to move ahead on it.

I think an improvement in the future would be to have a technical working group that can be engaged on the front end, so that we're not waiting and wondering what's going to be released in the draft, have two weeks to quickly analyze everything and comment, and then at least what we're seeing so far is that most of those comments are not incorporated.

It's a little bit backwards from what it could be. And I think if a technical work group would be established, it would also take pressure off of staff.

Thank you. I'm out of time, but we have a lot more to say on this, and I wish I had more time, but much appreciated. *(BLUESOURCE-4)*

Comment: Finally, IETA urges ARB to carry out forestry and other future proposed protocol modifications in an inclusive, predictable, and transparent manner. Specifically, we recommend that ARB pursue an effective engagement approach similar to that used for the rice protocol.

Such a process would include clear communication and engagement with all stakeholders, including experts and regulated parties. On behalf of IETA thank you for your time and this opportunity to comment. *(IETA-3)*

Comment: …and putting aside and having a technical working group on the provisions that need to be tweaked just enough to get it over that finish line. *(CCEEB-2)*

Comment: Rather than adopting the problematic changes highlighted above, we urge the Board to direct staff to organize a technical work group process to allow for a more robust discussion of proposed amendments to the Forest Protocol and produce language that more accurately and efficiently addresses the perceived matters of concern. This is consistent with the use by ARB of technical work groups to draft the Rice Cultivation Protocol and the Climate Action Reserve's Forest Project Protocol 3.2, which served as the basis for the Forest Protocol. *(SPI-3)*

Comment: We respectfully request that a technical working group be formed to allow further refinement of the language to better address the complex technical issues involved. Thank you for your consideration of our request. We would appreciate the opportunity to participate in any protocol technical working group that may be organized. *(GDRC -3)*

Comment: The Climate Trust believes that the current lack of transparency and stakeholder input in developing the proposed revisions currently before the Board greatly contribute to the perception that carbon markets are highly vulnerable to policy change. This vulnerability makes it more difficult to bridge private capital with environmental markets and inhibits the growth of this vital sector. *(TCT-1)*

> **Response:** ARB staff has used technical workgroups in the past and will continue to use technical workgroups in the future, when appropriate. During the development of the current proposed changes, ARB staff felt that workshops/webinars and direct interaction with stakeholders was a more beneficial method for developing these modifications. ARB's response to comments related to the public process ARB undertook to develop the current proposed update to the Forest Protocol can be found in ARB's response to Comment C-3.1.
>
> In addition, as directed by the Board at the hearing to adopt the Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing.

C-3.6. Multiple Comments: A process to enable staff to release minor public clarifications (where no impact on offset supply is expected) on matters related to

protocols in a timely and more frequent manner. This is likely to reduce the need for regular, more significant, changes to protocols while providing needed clarity to market participants. *(BPAI-1)*

Comment: I have followed the development of the staff's presentation since its very inception, since the beginning of efforts, not only for the Chugach people, you know, our client, but frankly as an unpaid advisor to the Board of American Carbon Registry, who you just heard from. And I'm aware -- we are all aware of all the concerns and issues that have arisen.

And now I ask at this late date, having heard everything, that you give serious consideration to what you've heard about process and procedures and potential chilling effects.

I'm hopeful that, and I'm 100 percent dependent upon your staff to take your guidance to deal with guidance document language to address as many of these problems as your lawyer can see fit can be addressed within the parameters. *(CAC-3)*

Comment: Discussions with various stakeholders does have value, and ARB staff has been making themselves available for discussions, and they reach out frequently to garner input from project developers and others. The above example is one where they sought FIA expertise, but project developers could have given a different perspective, and the split could have been done correctly without creating an error.

The protocol revisions, I'm going to echo what other folks have said, leave uncertainty in certain sections, and that's going to lead for additional – to additional guidance being required. We would like to offer to engage with ARB staff as they develop that guidance. And, in particular, we think it's important to give careful consideration to the logical management unit definition. We also would like to recommend that additional staff be created, and that could be -- especially since we think there is going to be with these changes additional interpretation needed, which suggested that could be funded either from auction proceeds or from a fee on offset transactions and CETS.

Our view is that the success of this system will create significant conservation value across the U.S. and is, and serves as an effective outreach mechanism in climate change mitigation policy, which is a primary goal of AB 32 to reach out beyond California.

So thank you very much. Appreciate your attention. *(NFI-4)*

> **Response:** ARB staff has a policy in place for releasing and updating frequently asked questions (FAQ) about all aspects of the Compliance Offset

Program, including the Forest Protocol. In addition, as directed by the Board at the hearing to adopt the Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing.

ARB has taken steps to ensure adequate staff resources are in place to implement the compliance offset program, including developing guidance for the Forest Protocol, as necessary, with input from stakeholders.

C-3.7. Comment: We believe the California Air Resources Board (Board) should direct staff to convene a stakeholder workgroup to better address the complex technical issues involved. We urge the Board to remove the three sections and associated definitions identified in the joint letter and urge the staff to conduct additional workshops to address all of the technical issues above, plus those that will be raised in comment letters by other stakeholders. *(CFA-3)*

Response: The commenter states that the Board should direct ARB staff to convene a stakeholder workgroup to address the proposed technical changes. ARB has responded to this comment in its response to Comment C-3.1.

As directed by the Board at the hearing to adopt the Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing.

C-3.8. Multiple Comments: We were a joint signatory to a letter that included several large RPs, as well as those more closely involved forestry. I mean, you're hearing from a lot of them today. There's a lot of expertise on forestry in this room, and I think it's important that we take advantage of that to get the protocol to the right place.

First of all, we have to be very careful about moving this protocol forward without being sure that we utilizes all the expertise, and without being sure of the impact on supply. *(BPAI-2)*

Comment: Process Concerns with Offset Protocol Changes and Recommended Solutions

WSPA is also concerned with institutional flaws in ARB's processes for refinement of offset protocols. Protocol reviews must be predictable and transparent with reasonable timelines between reviews and updates. ARB should avoid changes on short notice or within compliance periods, as these actions tend to disrupt the offset

supply-demand balance and undermine market confidence in offsets generated pursuant to implicated protocols. Unfortunately, ARB's recent actions on the US Forestry Offsets Protocol do nothing to inspire new projects or overall market confidence.

Of particular concern is ARB's decision to make changes without a full public review and comment period. ARB has defended this decision by reference to its authority under the Cap and Trade regulation to make "quantitative" changes to offset protocols without soliciting public comments. Yet in the absence of input from forestry experts and a thorough assessment of potential impacts on project developers and offset purchasers, it is reasonable to expect negative consequences for long term offset supply. Market knowledge that ARB is making decisions on the basis of limited information will serve to further undermine investor confidence and likely diminish investment in forestry offset projects.

To address these concerns, WSPA recommends that ARB adhere to the public participation process it typically employs for rulemakings. ARB should engage stakeholders in a meaningful period of informal dialogue and development of amendments, specify a timetable for issuance of a formal proposal, allow for a full 45-day public comment period on that proposal and present a complete final rulemaking package to the Board for consideration and formal adoption. Also, as noted above, substantive changes to offset protocols should not take effect until the start of the next compliance period. Adhering to this public participation process would maintain the confidence of developers and investors and help increase the pool of offsets available to achieve emission reductions in a cost-effective manner. *(WSPA-1)*

Comment: However, I would like to echo some of the concerns you've heard today about other changes to the U.S. Forestry protocol, and the impact those might have on the supply of offsets. We've signed on a number of coalition letters to that effect.

We understand that ARB is pursuing many of these changes to ensure the environmental integrity of the program. And we certainly agree that periodic review and update of the protocols is necessary to achieve that objective.

But moving forward, we just would encourage ARB to carry out these activities in a predictable manner that is clearly communicated to stakeholders and leverages all of the expertise we have here in the room today.

As we look towards 2030, the role of offsets in ensuring access to cost effective emissions reductions, and demonstrating to other jurisdictions that voluntary actions can play a role in reducing emissions, while also stimulating the economy will become increasingly important. It's worth the time to get it right, and I would just like

to thank staff for their commitment today to provide additional guidance following the hearing today. *(PGE-3)*

Response: The above commenters state concerns regarding ARB's stakeholder engagement process as it relates to the current proposed update of the Forest Protocol. These comments are addressed in ARB's response to Comment C-3.1. WSPA references the AB 32 exemption of "quantification methodologies" from the APA. As required by AB 32 "quantification methodologies" still require a public process and full CEQA review. However, the amendments to the Forest Protocol did not undertake the changes to the protocol under the exemption as the commenter suggests. The Forest Protocol modifications went through the full regulatory process, conforming to all the requirements of the APA including public comment periods.

The commenters also state concern that the proposed changes to the Forestry Protocol will result in reduced offset supply. While offset supply is an important factor, assuring that all ARB offsets represent real, permanent, quantifiable, verifiable, enforceable, and additional GHG emission reductions and GHG removal enhancements is also important. ARB has taken several steps to address offset supply concerns. In addition to the four protocols originally approved in 2011, ARB has added a Mine Methane Capture offset Project Protocol, is proposing to add a Rice Cultivation Projects Protocol, and extend the geographic scope of the current Forestry Protocol to include Alaska. Staff will continue to evaluate and propose new offset protocols that will generate compliance offset credits that meet AB 32 criteria. It is also important to note, that there is no indication that all possible projects have been implemented under the existing protocols. Offset projects are price-responsive. If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, ARB expects project developers will respond by undertaking more projects with the expectation of higher returns on investment. Therefore, the proposed changes would not substantially affect offset supply.

C-3.9 Multiple Comments: The Climate Action Reserve also supports ARB's efforts to update and clarify various components of the Compliance Protocol for U.S. Forest Projects. We believe a few issues in the Draft would benefit from more clarification and we have separately submitted a letter with other co-signatories representing a range of interests that provides some recommendations for technical adjustments to that end. We encourage you to consider these adjustments and to adopt the updates to the Forest Project Compliance Protocol. *(CAR -2)*

Comment: Additionally, we urge the Board to adopt the recommended technical adjustments to the Forest Protocols submitted in a separate letter by the Climate Action Reserve, The Nature Conservancy, and others. These changes would

provide much needed clarification to the interpretation of protocol provisions. If the changes cannot be adopted at this time, we recommend a technical workgroup process to help resolve these items. *(TNC -3)*

Comment: We just want to mention both on the even-age management and logical management unit, those definitions, we signed onto letter with the Climate Action Reserve and others offering some further clarifications that could be helpful just for being able to interpret and verify. So if there's opportunity and maybe some follow-up guidance on these issues, then we'd be happy to help. And I'm sure you'll near from others on some recommendations there. *(TNC-4)*

Comment: We submitted a letter under the name Green Diamond under my signature. We also were co-signatory to the multi-stakeholder letters that went in, including the CAR letter, which Ms. Passero just identified as identifying some recommended technical changes. We're fully supportive of those changes.

While these rules -- while these come very close to representing the California Forest Practice Rules, there's some subtle technical differences that are not reflected in these changes, and we'd request that you consider those technical changes that are offered in the multi-stakeholder letter that has been authored by CAR. And you have some very concise and precise changes that are recommended. *(GDRC-4)*

> **Response:** ARB thanks the commenter for their support and continued participation the compliance offset program. Specific comments in the letter the commenters reference are addressed separately in this document.
>
> As directed by the Board at the hearing to adopt the Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. Any further guidance on the even-aged management subchapter will be based on the California Forest Practice Rules.

C-4. Even Aged Management

C-4.1. Comment: Our specific concerns with the proposed revisions are as follows:

1. The general eligibility requirements outlined in S 3.1(a)(4)(A) and (B) are not appropriate forestry management standards for many forests in the eastern U.S., nor do they provide adequate flexibility for proper forest health and environmental management outside of California - deterring participation outside of California.

2. The strict and onerous provisions surrounding both the definition of ‘even-aged management’ and associated buffers places unnecessary constraints on a forest owner’s ability to maintain economically productive forests - a necessary co requirement to support participation in the program. *(BPAI-1)*

Response: ARB selected the California Forest Practice Rules as an appropriate standard because the existing even-aged management requirements in the Forest Protocol adopted by the Board in 2011 were based on the California Forest Practice Rules. One of the goals of the compliance offset program is to encourage the spread of California’s high sustainability standards to other states. The compliance offset program is a voluntary program in which entities choose to participate. The implementation of the program requires equitable standards that can be applied equally across all states. The California Forest Practice Rules is the basis for these equitable standards regarding even-aged management.

C-4.2. Comment: In addition, there are other technical issues with the proposed amendments.

Examples of technical issues are:

- As currently proposed, the new section on stocking status when even-aged regeneration harvest is utilized has two missing requirements from the California Forest Practices Act implementing regulations that will cause unnecessary delay, added cost and would not be able to complete a full verification. *(CFA-3)*

  Response: ARB staff disagrees with the commenter's assertion that there are missing requirements for the stocking status of even-aged harvest. The even-aged management provisions of the Forest Protocol have been harmonized with the California Forest Practice Rules, as directed by the Board at the December 2014 Board hearing, and were reviewed by the California Board of Forestry and the Department of Forestry and Fire Protection for conformance with the California Forest Practice Rules. Neither agency identified any concerns with the provisions.

  As directed by the Board at the June 25, 2015, hearing to adopt the Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. Any further guidance on the even-aged management subchapter will be based on the California Forest Practice Rules. As part of this process, any necessary clarifications will be provided.

C-4.3. Comment: (20) “Countable Tree” means a tree that must be in place at least two growing seasons and must be live and healthy.

Section 1.2 includes the new term "countable tree" for the purposes of determining stocking levels for regeneration in even-aged management (pages 21-22). Because this definition is relevant primarily to the restocking requirements in Section subchapter 3.1(a)(4)(D), it deliberately excludes standing dead trees. This leaves the retention of standing dead trees subject only to the minimal requirements of Section 3.1. This is generally one metric ton of carbon per acre or 1% of standing live tree carbon stocks, in standing dead tree carbon stocks, whichever is higher.

Including standing dead trees in the stocking requirements is one way that the Forest Protocol could encourage the retention of large, standing dead trees, which are critical for wildlife. This would potentially be very positive for wildlife habitat even if it resulted in marginally lower stocking levels of live trees. Furthermore, counting large (e.g. greater than 12 inches dbh) standing dead trees may not have any negative impact on stocking of live trees, as projects are likely to manage for high live tree densities to maximize carbon stocks. *(CBD-1)*

> **Response:** The even-aged management provisions of the Forest Protocol have been harmonized with the California Forest Practice Rules, as directed by the Board at the December 2014 Board hearing. The definition for “Countable Tree” is taken directly from the California Forest Practice Rules. Modifying the definition may pose additional requirements for projects in California, which is counter to the intent of the current proposed protocol revisions. As the commenter notes, there are already provisions in the protocol to ensure adequate stocking of standing dead trees.

C-4.4. Comment: “Even-Aged Management” means a silvicultural system that includes clearcutting, seed tree, and shelterwood regeneration methods. Any harvest activity that does not meet the stocking requirements of subchapter 3.1(a)(4)(D) is also considered even-aged management, unless a state agency with jurisdiction over the project area identifies the practice as uneven-aged management. By convention, the spread of ages does not differ by more than 20 percent of the intended rotation.

Deferring to individual states' definitions of even-aged and uneven-aged management means that the same forest project would be subject to different standards under the Forest Protocol, depending on which state a project is located in. Specifically, the stocking requirements of subchapter 3.1(a)(4)(D) would not apply, for example, if a state were to define shelterwood cuts as uneven-aged management. *(CBD-1)*

Response: Clearcutting, seed tree, and shelterwood silvicultural practices are considered even-aged management pursuant to the proposed Forest Protocol. In addition, most practices that reduce stocking below the requirements in subchapter 3.1(a)(4)(D) will be also considered even-aged management for purposes of the Forest Protocol. Since there are uneven-aged management practices that significantly reduce stocking to improve forest health, ARB staff determined that it was appropriate to defer to state forestry agencies in making this determination. A management practice would only be excluded from the even-aged requirements if a state were to explicitly identify the practice as uneven-aged management.

C-4.5. Comment: Even-aged management requirements [Section 3.1(a)(4)] and associated verification procedures [Section 8.1(b)(2)(E)]

The modified Protocol (proposed 20 May 2015) now requires additional verification requirements for areas where even-aged management prescriptions have been applied. In Section 8.1 Full Verification, subsection (b)(2)(E), the verification body is now required to evaluate conformance with harvest unit size by installing additional inventory plots in even-aged harvest areas. These additional sampling requirements will be very cumbersome to the verification field visit. As an example, if a project with 200,000 acres has 400 acres or more of even-aged management. This would require the OVB to sample 400 additional plots during a site visit, increasing time on-site and verification costs considerably.

From a verification perspective, it will be extremely difficult to complete the proposed minimum verification elements required within a reasonable review scope. We believe the requirements of the proposed updates are trending more towards an absolute review scope, and that existing Protocol requirements (within both the 20 October 2011 and 14 November 2014 Protocols) sufficiently promote onsite standing live carbon stocks. *(ESI-2)*

Response: The verifier must use professional judgment in applying the verification requirements in subchapter 8.1(b)(2)(E). Pursuant to section 95977.1(b)(3)(L) of the Regulation, verifiers are required to use professional judgment based on evaluation of a variety of risk factors when developing the sampling plan identifying what stands should be sampled. Stands that, based on the professional judgment of the verifier, are adequately stocked or not are not required to use the identified methods. Additionally, verifiers are required to make a risk-based assessment for sampling stands that may be in question to determine if the project operator adequately classified the stands as stocked. While the existing protocol standards may be adequate for promoting onsite standing live carbon stocks, they are not adequate for evaluating even-aged management requirements.

C-4.6. Comment: Even-aged management requirements Section 3.1(a)(4)(B)

The currently proposed harvest adjacency requirements do not provide a clearly defined process for verification. The proposed linear distance requirement is sufficient and avoids the confusion associated with the measurement of harvest adjacency areas. *(ESI-2)*

> **Response:** For determining the separation between even-aged harvests, subchapter 3.1(a)(4)(B) of the Forest Protocol contains a both an area and linear metric that are applied together. The buffer "shall be separated by at least 300 ft. in all directions" and the total area of the buffer around an even-aged managed must sum to the acreage requirement. The verifier will have to make two determinations: 1) is there at least 300 linear feet in all directions from the even-aged harvest, and 2) does the total area around the harvest meet or exceed the acreage requirements of the protocol. The linear requirement alone is not sufficient because alone it would not assure an adequate buffer under all conditions.

C-4.7. Comment: The definition of Countable Trees [Section 1.2(a)(20)] The definition of Countable Trees is unclear, as written.

Please explain how reproducible tree measurements can be obtained under the currently proposed definition for "two growing seasons" and "healthy." *(ESI-2)*

> **Response:** The even-aged management provisions of the Forest Protocol have been harmonized with the California Forest Practice Rules, as directed by the Board at the December 2014 Board hearing. The definition for "Countable Tree" comes directly from the California Forest Practice Rules. The growing season is a commonly understood timeframe from spring to summer with optimum climate for tree growth. A healthy tree is again a common term indicating a tree capable of growth. To obtain a reproducible measurement both the project operator and the verifier would count trees that are capable of growth and were planted by at least the prior spring.
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> As directed by the Board at the June 25, 2015, hearing to adopt the updated Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. Any further guidance on the even-aged management subchapters will be based on the California Forest Practice Rules. As part of this process any necessary clarifications, including how to determine healthy trees or two growing seasons, will be included.

C-4.8. Comment: The definition of Even-Aged Management [Section 1.2(a)(22)] It is unclear what is meant by "By convention, the spread of ages does not differ by more than 20 percent of the intended rotation." Please clarify. *(ESI-2)*

> **Response:** This provision is unchanged from the Forest Protocol adopted by the Board in 2011. Even-aged managed stands traditionally have only small differences in their ages, and are harvested on a rotational schedule. ARB expects the age of the majority of trees with an even-aged managed stand would fall within 20 percent of the rotation length for that stand.

C-4.9. Comment: The definition (and related requirements) of the Logical Management Unit (LMU) [defined in Section 1.2(a)(31)]

When compared to the 20 October 2011 and 14 November 2014 Protocols, Section 5.2.1(d)(1) of the modified Protocol (proposed 20 May 2015) includes a different equation for determining the Minimum Baseline Level (MBL) where Initial Carbon Stocks are above Common Practice (CP) (Equation 5.5). This equation requires the use of the parameter WCS, the weighted average above-ground standing live tree carbon stocks per acre within the LMU containing the project area. In previously adopted Protocol versions, the MBL is set to equal CP when ICS is above CP (Equation 6.5).

ESI wishes to offer important comments on the definition of the LMU should ARB decide to move forward with Equation 5.5 as presented in the modified Protocol (proposed 20 May 2015). These are outlined below:

Section 1.2(a)(31) states "Logical Management Unit" or "LMU" means all land that the forest owner(s) and its affiliate(s) either own in fee or hold timber rights on and that are within the same assessment area(s) where the project is located." It is commonly known that Assessment Areas are not spatially explicit, but rather based on forest ecosystems or communities (groups of species).

How will a LMU be adequately defined by an OPO and verified by an OVB?

ESI suggests changing "assessment area(s)" to "Supersections," as these are spatially explicit and efficiently verifiable.

ESI is requesting ARB to develop step-by-step procedures for determining and verifying the LMU, per the definition included in Section 1.2(a)(31). *(ESI-2)*

> **Response:** As defined in the Forest Protocol, an assessment area is a forest vegetation community that shares common environmental, economical, and regulatory attributes. All assessment areas are identified in the Assessment Area Data File on the ARB website. The assessment area identifies to the project operator and verifier a limited area that must be evaluated. Forest

Owners will be required to identify and provide evidence so that the verifier can confirm with reasonable assurance the assessment areas for the Forest Owner's other landholdings within the supersection. The assessment area was chosen because Common Practice values, which are also used to determine the minimum baseline, are reported on an assessment area basis.

As directed by the Board at the June 25, 2015, hearing to adopt the updated Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. As part of this process, any necessary clarifications, including on how to further define and evaluate the Logical Management Unit, will be included.

C-4.10. Comment: Definition of 'Even-Aged Management' (Page 4) The Reserve recommends removing the definition and replacing the definition with 'Even-Aged Regeneration Harvest or Management' (below). The limitations in the protocol regarding even-aged management are intended to address even-aged regeneration harvests only, not even-aged harvests where the post-harvest stands meet stocking standards immediately upon completion of harvest.

Establishing thresholds for even-aged management are a good step to clearly identify what constitutes an even-aged regeneration harvest. There are two problems. First, the definition of all even-aged management is linked to the threshold (it should only be even- aged regeneration) and second, the threshold is based on stocking standards from the California Forest Practice Rules (FPRs). We recommend de-linking the definition of even- aged management from the stocking standards and linking them to the most conservative retention allowed for an even-aged regeneration harvest (see the definition below in Comment 3). Any harvest would be identified as an even-aged regeneration harvest if it falls below this threshold.

The effect of the current definition would assert more stringent limitations on California forest landowners than the current FPRs do as variable retention and rehabilitation silviculture would be limited to 40 acres. Retention levels for variable retention and rehabilitation are often below 50 square feet.

In addition, we recommend removing the following sentence: "By convention, the spread of ages does not differ by more than 20 percent of the intended rotation". This sentence is not clear and will raise the costs of verification.

The term 'Even-Aged Management' is replaced with 'Even-Aged Regeneration Harvest or Management' in subsequent recommendations (Comment #4). *(SIGLLC-2)*

Response: ARB staff disagrees with the commenter's assertion that the current definition of even-aged management would be more stringent than the California Forest Practice Rules. The even-aged management provisions of the Forest Protocol have been harmonized with the California Forest Practice Rules, as directed by the Board at the December 2014 Board hearing and were reviewed by the California Board of Forestry and the Department of Forestry and Fire Protection for conformance with the California Forest Practice Rules. Neither agency identified any concerns with the provisions, and ARB staff is unable to determine how the even-aged management requirements in the Forest Protocol could be perceived as more stringent. Variable retention and regeneration silviculture would only be considered even-aged management if they fall below 50 square feet of basal area, and below the 150 point count and are defined as even-aged management by the state forestry agency.

The 20 percent provision is unchanged from the Forest Protocol adopted by the Board in 2011. Even-aged managed stands traditionally have only small differences in their ages, and are harvested on a rotational schedule. The age of the majority of trees with an even-aged managed stand should fall within 20 percent of the rotation length for that stand. ARB staff disagrees that the provision is unclear.

C-4.11. Comment: Add new definition of 'Even-Aged Regeneration Harvest or Management' Replaces Even Aged Management. We recommend the following definition for 'Even-aged regeneration harvest or management' :The harvest step associated with Even-Aged Management that is intended to regenerate the stand with a new cohort of young seedlings, either naturally or artificially through tree planting. Clearcuts, seed tree, and shelterwood seed steps are examples of even-aged regeneration harvests. Any harvest that retains 30 square feet of basal area or less is considered an "Even-Aged Regeneration Harvest". The rationale for this definition is that 30 (Sites 1-3 and 24 on sites 4-5) square feet of basal area is equal to the minimum retention levels in a California definition of Shelterwood Seed Step, the even-aged regeneration step that retains the highest amount of trees. *(SIGLLC-2)*

Response: ARB staff disagrees that the definition of even-aged management should be replaced or modified. The even-aged management provisions of the Forest Protocol have been harmonized with the California Forest Practice Rules, as directed by the Board at the December 2014 Board hearing. ARB staff consulted with the California Department of Forestry and Fire Protection in determining the minimum stocking level to be considered even-aged management. Stands that are harvested below 50 square foot of basal area can still be considered uneven-aged management if they still meet

the 150 point count requirement or if the state forestry agency determines the practice is not even-aged management.

C-4.12. Comment: Section 3.1(a)(4)(B), Even-age regeneration harvest buffers, Page 21, we recommend rephrasing the buffer requirements to simply reference that no even-aged regeneration harvest can occur within 300 feet of another un-stocked even aged regeneration harvest to establish a clear and verifiable standard. Absent this refinement, the lack of a clear metric for assessing the even-aged regeneration buffer will result in increased verification costs. *(SIGLLC-2)*

> **Response:** ARB staff disagrees that the even-aged buffer requirement needs to be rephrased. The requirement of the buffer being equal to the size of the even-aged managed harvest or 20 acres, whichever is smaller, is from the California Forest Practice Rules. ARB staff was directed by the Board to harmonize with the California Forest Practice Rules and to consult with the Board of Forestry and the Department of Forestry and Fire Protection in the development of these requirements at the December 2014 Board hearing.

C-4.13. Comment: Section 3.1(a)(4)(C) Even-age adjacency requirements. Page 21:

The references to even-aged harvest unit, even-aged harvest method, or even-aged management should be refined to reflect the intent of this section to address even-aged regeneration harvest. The term has been suggested previously for inclusion in the update. Otherwise, limitations would be imposed to harvests that are stocked (meet point count or minimum basal area for stocking) upon completion, such as shelterwood removal. Additionally, the language in this section should be based on the California Forest Practice Rule Section 913.1(4) (a) so as not to assert additional restrictions on California projects within the Coast District. The Coast District includes an additional provision to allow stocking standards to be met within three years if the average tree height of regenerated trees is at least five feet tall. Hence, the revised section would be improved if it read as:

> "Within ownership boundaries, no area contiguous to an even-aged *regeneration* harvest unit may be harvested using an even-aged *regeneration* harvest method unless the average of the dominant and codominant trees on an acceptably stocked prior even-aged harvest *regeneration* unit is at least five feet tall, or at least five years of age from the time of establishment on the site, *or average at least five feet tall and three years of age from the time of establishment on the site*, either by the planting or by natural regeneration. If these standards are to be met with trees that were present at the time of the harvest, there shall be an interval of not less than five years following the completion of operations before adjacent even-aged *regeneration* management may occur; *(SIGLLC-2)*

Response: ARB staff disagrees that the even-aged requirement needs to be refined. The requirement of the buffer being equal to the size of the even-aged managed harvest or 20 acres, whichever is smaller, is from the California Forest Practice Rules. ARB staff was directed by the Board to harmonize with the California Forest Practice Rules and to consult with the Board of Forestry and the Department of Forestry and Fire Protection at the December 2014 Board hearing. The five-year or five-foot requirement was unchanged from the Forest Protocol adopted by the Board in 2011, and is also consistent with the California Forest Practice Rules for other regions of California.

C-4.14. Comment: Section 3.1(a)(4)(D): For consistency, we recommend that the term 'even-aged timber operations' be removed and replaced with the term 'even-aged regeneration harvests'. *(SIGLLC-2)*

Response: The even-aged management provisions of the Forest Protocol have been harmonized with the California Forest Practice Rules, as directed by the Board at the December 2014 Board hearing. Note that the basis for the requirements in subchapter 3.1(a)(4)(D) is section 912.7(b) of the California Forest Practice Rules.

C-4.15. Comment: Section 3.1(a)(4)(D): The stocking levels proposed in this section are fine for minimal stocking prior to initiating an adjacent even-aged regeneration harvest but they should not be used to define even- aged management (See Comment 2). *(SIGLLC-2)*

Response: ARB staff disagrees that the definition of even-aged management should be replaced or modified. ARB staff consulted with the California Department of Forestry and Fire Protection in determining the minimum stocking level to be considered even-aged management. It is necessary to set a minimum stocking level to prevent even-aged management techniques employed in other states which are not classified as clearcutting, shelterwood, or seed tree to still be appropriately identified under the even-aged provisions. Practices that do fall below the minimum stocking requirements will not be considered even-aged management if classified by the state forest agency as uneven-aged management.

C-4.16. Comment: Section 3.1(a)(4)(D) Page 22: Clarification of the buffer size and condition is an improvement. However, consideration needs to be provided as to how the stocking standards will be verified. Separate verification guidance should be developed immediately. It is recommended that a simple sampling methodology be developed for verification that focuses on checking the highest risk areas only when the appearance of inadequate stocking is present. Lacking verification

guidance, this requirement could result in tremendous verification costs and will reduce participation. *(SIGLLC-2)*

> **Response:** A sampling methodology for determining stocking levels is provided in subchapter 8.1(b)(2)(E) of the Forest Protocol. The verifier must use professional judgment in applying the verification requirements in subchapter 8.1(b)(2)(E). Pursuant to section 95977.1(b)(3)(L) of the Regulation, verifiers are required to use professional judgment based on evaluation of a variety of risk factors when developing the sampling plan identifying what stands should be sampled. Stands that, based on the professional judgment of the verifier, are determined to be adequately stocked or not are not required to use these methods. Verifiers are required to make a risk-based assessment for sampling stands that may be in question to determine if the project operator correctly classified the stands as stocked.
>
> Additionally, as directed by the Board at the hearing to adopt the Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. As part of this process any necessary clarifications, including on how to verify stocking, will be included.

C-4.17. Comment: Modified Even-aged Management and Harvest Buffer Requirements – Chapter 3.1(a) (4) (A-E)

New proposed language guiding even-aged management does not adequately consider the environmental impact of the proposed rules on forestland outside of California. While the intention was to align requirements for even-aged management with those of the California Forest Practice Rules, environmentally sound forest management is not a one-size-fits-all- proposition.

It has been explained to Finite Carbon that the intention of the proposed language is to improve the environmental credibility of the program. However, we believe the Air Resources Board has not adequately considered how this language may provide a financial incentive to harm biodiversity outside the State of California.

Rules concerning forest practices are not like vehicle emissions standards where California is setting a high bar for others to follow. Although the even-aged management language may be the most environmentally beneficial way to manage forests within California, it can have negative impacts if practiced outside of the state. We have identified several ways in which managing a forest under the proposed language can harm biodiversity if practiced at scale outside of California where 17 of our 19 projects on approximately 800,000 acres are located.

To be clear, we are not challenging language from the existing protocol which prohibits clear cuts larger than 40 acres. We are specifically addressing the current language which limits the extent of the practices of seed tree and shelter wood management which are sanctioned under widely respected certification programs such as Forest Stewardship Council (FSC).

Management situations where the proposed management restrictions may harm biodiversity:

- 40 acre or less regeneration cuts that are in areas of high undulate populations frequently fail due to over browsing. This includes most states east of the Mississippi, especially areas in New England, the lakes states, and Appalachia. Small unit harvests allow a relatively small local population to eradicate regenerating trees while larger regeneration harvests of more than 40 acres provide adequate food for local undulate populations and significantly increase the odds of tree survival. Limited regeneration cuts can lead to high browsing pressure on particular species and artificially alter the structure of forests. In several studies in the lake states, hemlock, white cedar, red oak, and yellow birch were found to be especially susceptible to this issue.

- 40 acre regeneration cuts with 50 square feet of basal area retention may artificially alter future species composition in a stand due to shade and competition. A cut with high basal area retention in Allegheny hardwoods may come back to birch, beech, and striped maple instead of cherry and red maple due to shade and browse combined.

- Stands with a high density of a single species like beech can be far more prone tobeing decimated by disease than a diversified stand. This is not good for biodiversity

or climate change. Furthermore, climate change can exacerbate the spread of disease – a climate change mitigation effort by California should not be allowed to contribute to the same issue.

- Many species need larger areas of early successional habitat and may bediscriminated against due to the small and fragmented nature of the cut size and buffer requirement. Canada Lynx, neotropical songbirds, Moose, and other species would all be impacted by limiting regeneration size. Carbon projects can cover significant areas of a single species' habitat and rules developed by California can have landscape scale impacts. Carbon projects developed for California already cover more than 4% of New Hampshire, one of only 6 states Eastern Moose inhabit.

We assert the proposed even-aged management practices criteria are only applied to even-aged regeneration harvests without retention or reserves, i.e. pure silvicultural clear cuts that remove an entire stand at one time. Even-aged

regeneration harvests with retention or reserves shall have to demonstrate sustainable and natural forest management and adequate retention appropriate for the project's location through forest certification, BMPs or silvicultural guidelines published by the state where the project is located, or a written forest management plan (or statement) that is approved by the agency in charge of forestry in the state the project is located.

Revised language:

(4) If the project employs even-aged management regeneration harvests without retention or reserves within the project area, which at the time of harvest entirely removes the pre-harvest existing stand, it must meet the following harvest unit size and buffer area requirements:

(A) Even-aged regeneration harvest units without retention or reserves must not exceed 40 acres in total area;

(B) Within ownership boundaries, even-aged regeneration harvest units without retention or reserves shall be separated by an area that is at least as large as the area being harvested or 20 acres, whichever is less, and shall be separated by at least 100 ft. in all directions; and

(C) Within ownership boundaries, no area contiguous to an even-aged regeneration harvest unit without retention or reserves may be harvested using an even-aged harvest method without retention or reserves unless the average of the dominant and co-dominant trees on an acceptably stocked prior even-aged harvest unit without retention or reserves is at least five feet tall, or at least five years of age from the time of establishment on the site, either by the planting or by natural regeneration;

(D) An area on which even-aged regeneration harvests without retention or reserves have taken place shall be classified as acceptably stocked if either of the standards set forth in (1) or (2) below are met:

1. An area contains an average point count of 150 per acre that meets the requirements of subchapter 8.1(b)(2)(E) to be computed as follows:

a. Each countable tree which is not more than 4 inches DBH counts 1 point;

b. Each countable tree over 4 inches and not more than 12 inches DBH counts 3 points; and

c. Each countable tree over 12 inches DBH counts as 6 points.

2. The average residual basal area measured in stems 1 inch or larger in diameter is at least 50 square feet per acre; and

(E) Cuts on harvest units that occurred prior to the project commencement date are exempt from subchapters 3.1(a)(4)(A) and 3.1(a)(4)(B) provided that no new harvests occur in the previously cut harvest unit or would-be buffer area until the harvest unit cut prior to project commencement meets the requirements of subchapter 3.1(a)(4)(A) and 3.1(a)(4)(B); and

(F) For even-aged regeneration harvests with retention or reserves, the OPO/APD must demonstrate that the level of retention or reserves does not violate any local, state or federal laws and regulations and is consistent with sustainable and natural forest management principles using one of the following options:

1. The project area is enrolled in third-party certification under the Forest Stewardship Council, Sustainable Forestry Initiative, or Tree Farm System, whose certification standards require adherence to and verification of harvest methods and retention levels appropriate by region which take age class and habitat objectives, among others, into careful consideration; or

2. The retention levels adhere to Best Management Practices and Guidelines published by the government agency in charge of forestry regulation in the state where the project is located; or

3. The retention follows a written forest management plan (or statement) that is approved by the government agency in charge of forestry regulation in the state where the project is located. *(FCC-3)*

> **Response:** The response to the environmental comments can be found in Attachment A to the FSOR. Based on the conclusion reached by ARB staff that the proposed changes to the Forest Protocol would not result in environmental impacts, ARB staff disagrees that the commenter's proposed changes need to be made.

C-4.18. Comment: The new procedure does not include how many harvests need to be examined in order to confirm that harvest size and buffer requirements have been met across the project. This will force verifiers to examine a potentially excessive number of harvested stands to feel comfortable that they are meeting ARB standards. This will increase both the cost and time required for site verifications.

- The new procedure requires that "Countable Trees," defined as "trees that must be in place at least two growing seasons and must be live and healthy." (page 4) be measured, but no definition of "healthy" is provided. This will lead to verification problems when determining which trees are acceptable to be counted.

- The new procedure mandates, “Even-aged harvest units shall be separated by an area that is at least as large as the area being harvested or 20 acres, whichever is less…” (page 21) but it is not clear how this area of separation between harvests is to be calculated. Linear distance between harvest boundaries is logical and verifiable, but an area metric is inappropriate here.

- The new procedure is unclear on how to assess the basal area requirement during full verifications. The procedures outlined in the protocol are for assessing the 150 point count/acre requirement, but there is no guidance on how to assess the 50 BA requirement. This could lead to verifier’s conducting work that will later be judged by ARB as unacceptable, thereby requiring additional field work, expense, and ARB staff time. *(RCE-2)*

Response: The verifier must use professional judgment in applying the verification requirements in subchapter 8.1(b)(2)(E). Pursuant to section 95977.1(b)(3)(L) of the Regulation, verifiers are required to use professional judgment based on evaluation of a variety of risk factors when developing the sampling plan identifying what stands should be sampled. Stands that, based on the professional judgment of the verifier, are adequately stocked or not are not required to use these methods. Verifiers are required to make a risk-based assessment for sampling stands that may be in question to determine if the project operator adequately classified the stands as stocked.

The even-aged management provisions of the Forest Protocol have been harmonized with the California Forest Practice Rules, as directed by the Board at the December 2014 Board hearing. The definition for “Countable Tree” comes straight from the California Forest Practice Rules. As directed by the Board at the hearing to adopt the Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. Any further guidance on the even-aged management subchapter will be based on the California Forest Practice Rules. As part of this process any necessary clarifications, including how to determine healthy trees or two growing seasons, will be included.

For determining the separation between even-aged harvests the Forest Protocol already contains a both an area and linear metric that are applied together. The buffer “shall be separated by at least 300 ft. in all directions” (subchapter 3.1(a)(4)(B)) and the total area of the buffer around an even-aged harvest must sum to the area requirement identified by the commenter; so no further modification is required.

Basal area is a common forestry term indicating the cross-sectional area of a tree based on the diameter at breast height. Pursuant to section 95977.1(b)(3)(L) of the Regulation, verifiers are required to use professional judgment based on evaluation of a variety of risk factors when developing that sampling plan identifying what stands should be sampled. If the verifier, using their professional judgment, selects an even-aged harvest for verification, they must measure a sufficient number of trees, again using professional judgment, to determine the harvest is adequately stocked. As stated above, at Board direction, ARB staff will be developing implementation guidance with the input of stakeholders which will include any necessary clarifications.

C-4.19. Comment: As currently written, the new section on stocking status when even-aged regeneration harvest are utilized has two missing requirements from the California Forest Practice Rules (CFPRs) that will cause unnecessary delays and added costs. These two important but highly technical issues would force even landowners that meet current California Forest Practice Rules to not be able to complete a full verification.

The first example is that the CFPRs allow a landowner to waive the stocking sampling system when areas are obviously stocked. (See 14 CCR 1074 and 1074.1) This is a recognized process, has been successfully utilized for decades and is a substantial cost savings for landowners. As currently written Section 8.1(b)2(E) starting on page 95 would only allow the verifier to accept actual stocking surveys even though the California Department of Forestry and Fire Protection has already accepted an area as meeting the stocking requirements, thus substantially increasing verification costs with no change in environmental benefit. *(SPI-3)*

Response: The verifier must use professional judgment in applying the verification requirements in subchapter 8.1(b)(2)(E). Pursuant to section 95977.1(b)(3)(L) of the Regulation, verifiers are required to use professional judgment based on evaluation of a variety of risk factors when developing that sampling plan identifying what stands should be sampled. Stands that, based on the professional judgment of the verifier, are adequately stocked or not are not required to be sampled. The verifier must make a risk-based assessment to determine which and how many stands that may be in question to sample to determine if the project operator adequately classified the stands as stocked. If the project operator has documentation from the California Department of Forestry and Fire protection indicating areas have been deemed acceptably stocked, the verifier may use their professional judgment when making their risk-based assessment of which stands require sampling.

C-4.20. Comment: The second example is Section 8.1(b)2(E)7 on page 96 is missing an essential part of the definition of a contiguous unstocked plot which is found in 14 CCR 1073(a). That is as follows:

An unstocked plot shall not be counted as contiguous to another unstocked plot if any of the following occur:

> (1) Where, in use of the point count or combination stocking sampling procedure, an unstocked plot has a countable tree located in the largest circular concentric plot described in the procedure.
>
> (2) Where the forest practice rules allow only the basal area sampling procedure to be used, the continuity of the six contiguous plots may be considered broken if one or more of the contiguous unstocked plots meets the minimum stocking standards of the Act.

This missing part would result in areas that are completely stocked, regularly failing the 5 contiguous unstocked plot rule because the random chance of 5 apparently contiguous plots occurring when only 55% of the plots are necessary to meet the sampling procedure to determine successful stocking status. *(SPI-3)*

> **Response:** The even-aged management requirement subchapters of the protocol were reviewed by the California Department of Forestry and Fire Protection for consistency with the California Forest Practice Act, and they did not identify either of these two items as essential to identifying unstocked plots. Item (2) identified by the commenter is not applicable to the point count method because it only is used for basal area sampling.
>
> As directed by the Board at the hearing to adopt the Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. As part of this process any further clarifications will be included.

C-4.21. Comment: While the requirements for projects that practice even-aged management are an improvement from those suggested in the previously proposed changes to the protocol, they remain inconsistent with forest practices in many regions outside of California. Additionally, this will significantly increase costs of monitoring and verification, limiting participation. Please conduct further review, engaging stakeholders on a national level to develop definitions of even-aged management applicable to forests nationwide. *(ECOP-2)*

> **Response:** The even-aged management provisions of the Forest Protocol have been harmonized with the California Forest Practice Rules, as directed

by the Board at the December 2014 Board hearing. It is ARB policy that the California standards should be the minimum standards applied throughout all areas eligible for implementing projects under the protocol. With one set of prescriptive standards, projects, in- or out-of-state, are treated equitably. It is not practical for ARB to adopt the standards of every state or region when establishing minimum standards for participation.

C-4.22. Comment: Our specific concerns are as follows:

A review of the new requirements indicates that they are transcribed, verbatim, from the corresponding regulatory requirements embodied in the California State Forest Practice Rules. The effect, if not the intent, appears to be to impose the requirements of those Rules, so far as they relate to harvest unit size, regeneration requirements and spatial constraints on harvesting with respect to even-aged silvicultural methods, on all project participants in the forest carbon offset market throughout the United States. While the desire to "level the playing field" is understandable, the following challenges with the approach undertaken are foreseen by SCS.

- The California Board of Forestry and Fire Protection has relatively free rein (within certain constraints) to update the California Forest Practice Rules, as needed, to correct errors or inconsistencies in those rules and to update those rules to address circumstances as they arise. The process for updating the Forest Offset Protocol allows for significantly less flexibility. Thus, adverse effects potentially resulting from an error or lack of clarity in any new requirements may not be easily or promptly rectified.

- As the California Forest Practice Rules are not intended to be applied to areas outside of California, as they are responsive to California's unique socio-political and bio-physical contexts, unintended consequences could well result from imposing key sections of the California Forest Practice Rules on other areas of the United States.

- The transcription of these regulatory requirements into the Forest Offset Protocol will oonly further increase the uncertainty inherent in offset project development, as the already-high stakes for players in the marketplace will be dramatically increased. *(SCS-3)*

Response: As a result of Board direction from the December 2014 Board hearing, it was the intent of ARB staff to harmonize with the California Forest Practice Rules. ARB selected the California Forest Practice Rules as an appropriate standard because the existing even-aged management

requirements in the Forest Protocol adopted by the Board in 2011 were based on the California Forest Practice Rules. One of the goals of the compliance offset program is to encourage the spread of California's high sustainability standards to other states. The compliance offset program is a voluntary program in which entities choose to participate. The implementation of the program requires equitable standards that can be applied equally across all states. The California Forest Practice Rules is the basis for these equitable standards regarding even-aged management.

The California Forest Practice Rules are part of the California Code of Regulations, and as such, have the same requirements for revisions as the Cap-and-Trade Regulation, which include all the Board adopted Compliance Offset Protocols. If the California Forest Practice Rules are amended, ARB would have to undertake a new rulemaking to harmonize with the amendments. This process allows the public the opportunity to review and comment on any changes to the Regulation and protocols.

The harmonization with and inclusion of text from the California Forest Practice Rules provides specific requirements which projects must meet. This should provide certainty to stakeholders about the applicable requirements.

C-4.23. Comment: Section: 3.1(a)(4) Language: (A)Harvest units that have less than 50 square feet of basal area retention must not exceed 40 acres in total area; (B) Open canopy harvest units, harvest units with an area of 3 acres or greater that have less than 50 square feet of basal area retention, must have a buffer area of forest vegetation containing at least 50 square feet of basal area retention must surround the harvest unit. 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;

Comment: SCS is concerned that the addition of this new requirement would be a major disincentive for projects outside of CA. Not only is this requirement extremely burdensome and time- intensive to verify, it does not stipulate an end time for the adjacency requirement.

Please clarify how clause B of this requirement is to be met should surrounding areas be under a different ownership or be of a non-forest classification type. *(SCS-3)*

Response: These requirements were removed in the 15-day version of the protocol; therefore, no response is necessary.

C-4.24. Comment: Section: 3.1(a)(4): Language: If harvesting occurs within the project area, meet the following harvest unit size and buffer area requirements…

Comment: SCS is strongly opposed to the language of Section 3.1(a)(4), as it is opposed to any language restricting forest management practices beyond the sustainable forest management requirements already contained within the currently prevailing Protocol. These requirements, which originate in the Climate Action Reserve's Forest Project Protocol Version 3.2, were developed during a lengthy series of work group sessions with a diverse group of stakeholders that included major landowners, the environmental community, the agencies, non-governmental organizations and other interested parties (including SCS). The balanced series of requirements emerging from that process ensured appropriate environmental safeguards while also facilitating widespread participation (and, thus, GHG emission removal enhancements) across a variety of geographic locations, ownership categories and landowner objectives. By contrast, the requirements of Section 3.1(a)(4) would restrict forest management far beyond the requirements of the most restrictive state-level regulations (including the California Forest Practice Act and Rules), thus unnecessarily limiting marketplace access and introducing burdensome complications with no discernable benefit (environmental or otherwise).

The requirements of Section 3.1(a)(4)(A) would impose an arbitrary opening size that is far smaller than the industry standard in many areas. The requirements of Section 3.1(a)(4)(B) would impose a buffer area that is from 330% (for a 10- acre harvest unit) to 891% (for a 40-acre harvest unit) as large as the harvest area itself. Moreover, unlike many comparable state forest practice regulations (which allow for "buffer" areas to be harvested after "green-up" has occurred, i.e., after the harvest unit is stocked with regeneration of a prescribed size and density), the draft revision would contains no such prevision, thereby requiring retention of the buffer areas in perpetuity. Such requirements can only be described as punitive. In many circumstances, harvests that leave a residual basal area of less than 50 square feet per acre are completely compatible with sound forest management strategies, including management strategies that are geared at maximization of environmental benefits. For example, landowners may choose to implement such harvests in order to shift species mixes (including favoring species that provide better habitat for certain wildlife species) or accelerate development of late-successional forest structures, provide habitat for animals and plants that thrive in early-successional forested settings, in addition to meeting financial and other management objectives. SCS is aware of no reason that such management strategies should be disincentivized in such a dramatic fashion.

Finally, imposition of the proposed requirements would place verification bodies in the role of forest practice inspectors and substantively (if not dramatically) increase the level of effort required for offset verification services. As outlined above, this increase in required verification effort would carry with it no discernable benefit. In summary, the requirements of Section 3.1(a)(4) constitute a completely unwarranted

and unnecessary addition to the Protocol. It is recommended that they be removed in their entirety. *(SCS-3)*

> **Response:** The commenter is referring to provisions that were substantially modified in the 15-day version of the protocol. The one part of the comment that is applicable to the 15-day version is the opposition to any language restricting forest management practices beyond the sustainable forest management requirements already contained within the existing Protocol. The original Forest Protocol adopted by the Board in 2011 contains many restrictions on forest management practices, including the requirements for multiple ages and mixed native species, and restrictions on even-aged management. The native species requirements are unchanged and the even-aged management requirements are only clarified. The original even-aged management requirements contained both stocking requirements and buffer requirements taken directly from the California Forest Practice Rules. However, these requirements were incomplete and difficult to verify. As a result, ARB staff included the remaining requirements from the California Forest Practice Rules to clarify the protocol requirements. Forest projects can create long-term climate benefits as well as environmental benefits, including sustaining natural ecosystem processes. To ensure these environmental benefits, ARB staff felt it was critical to include limits on forest management practices in the protocol.

C-4.25. Comment: The even-aged management provisions would also disadvantage out-of-state forestry projects relative to in-state projects. They are inconsistent with accepted silvicultural practices in many areas of the nation by virtue of incorporating a new requirement derived from in-state forest management practices—a 50 square foot minimum basal area (BA) retention limit – which is not representative of forest management practices in other regions. Though the latest Protocol draft includes a point-based alternative to the 50 BA retention limit, vagaries in the definitions associated with the point-based analysis and in the technical heralds related to the process for carrying out such an analysis make the point-based system an inadequate alternative. We are concerned that this change will promote greater market uncertainty concerning the value of offsets generated from out-of-state forestry projects, discouraging investment in these projects and further limiting the size of the offset pool.

… We also recommend that ARB remove the proposed BA retention limit to accommodate necessary regional variation in forest management practices and stimulate market interest in both in-state and out-of-state forestry projects. *(WSPA-1)*

> **Response:** The 50 square foot basal area retention has been removed as a method for determining harvest restrictions. The point count method is used

to determine adequate stocking after an even-aged harvest; this is a separate requirement. Along with the point count method, there is a 50-square foot residual basal area requirement that the commenter may be referring to. ARB staff disagrees that the even-aged management requirements of the protocol would create a disadvantage for out-of-state forestry projects relative to in-state forestry projects. One of the reasons ARB staff clarified the even-aged management requirements was to ensure all projects are meeting the same standards. With one set of prescriptive standards, projects, in- or out-of-state, will be on a level playing field. With the addition of the point-based system there are now two methods for determining adequate stocking. ARB staff is unsure what vagueness in the point-based system the commenter is referring to. There is a well-defined 150-point requirement with a prescriptive method, used with the professional judgment of the verifier, to determine stocking.

C-4.26. Comment: ***3. Even-aged management and verification of point count stocking in Section 8.1(b)(2)(E).*** The proposed language for verifying a forest's adherence to stocking and buffer standards when even aged management takes place are not sufficiently explicit and lack the clear guidance required by verifiers. As currently drafted, the language does not follow the California Forest Practice Rules, and could lead to cost-prohibitive verifications of all even-aged harvest units. In discussions with ARB staff, they have acknowledged that this was not the intent of the language. Rather than adopting this version of the protocol with the current language and relying on future guidance, we strongly encourage ARB to remove this language and work to further refine the language in a work group process so that it better aligns with the intent of staff and the requirements of the California Forest Practice Rules. *(NFI-3)*

Response: ARB Staff disagrees with the commenter's assertion that the current requirements for even-aged management do not follow the California Forest Practice Rules and are not sufficiently explicit. The even-aged management provisions were harmonized to the California Forest Practice Rules as directed by the Board at the December 2014 Board hearing, and were reviewed by the California Board of Forestry and the Department of Forestry and Fire Protection for conformance with the California Forest Practice Rules. Neither agency identified any concerns with these provisions. The commenter did not provide specific examples of language they feel needs refinement for ARB staff to review and comment on.

ARB staff has been providing guidance on project implementation since the beginning of the Compliance Offset Program. ARB staff has procedures in place for releasing and updating frequently asked questions (FAQ) about all aspects of the offset program including the Forest Protocol. In addition, as

directed by the Board at the hearing to adopt the Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing.

C-4.27. Comment: Avoid area based buffer calculations, which can be difficult to establish and verify, instead opting for linear buffer distances where necessary. In the context of the proposed protocol, the language -

"Even-aged harvest units shall be separated by an area that is at least as large as the area being harvested or 20 acres, whichever is less, and shall be separated by at least 300 ft. in all directions;" should be revised to simply require that even-aged harvests be separated by at least 300 feet in all directions. *(BLUESOURCE-5)*

Response: The even-aged management provisions of the Forest Protocol have been harmonized with the California Forest Practice Rules, as directed by the Board at the December 2014 Board hearing, which contain both the acreage and liner buffer requirements. The linear requirement alone is not sufficient because alone it would not ensure an adequate buffer under all conditions.

C-4.28. Comment: We also recommend that ARB remove the proposed basal area retention limit to accommodate necessary regional variation in the forest project -- and forest management practices and stimulate interest to -- in both in-state and out-of-state forestry projects. *(WSPA-2)*

Response: The basal area retention limit was removed in the 15-day version of the Forest Protocol; therefore, a response is not necessary.

C-4.29. Comment: We do share a lot of the concerns over technical details that others have mentioned and hope that we an work with staff to iron out these concerns. I'll highlight some potential effects that we are concerned about. We're assume they're unintended to illustrate why we hope that these things can be addressed.

First, with regards to the clarification on limitations to the use of even-age management practices, we actually think the proposed modifications are great for California, but we're concerned about impacts out of State. The modifications actually run contrary to regulatory requirements and BMPs in some other states. I mean a hardwood forest in Vermont is very different than a mixed conifer forest in Sierra Nevada, and what works in one is not necessarily appropriate in the other.

Basically, it just means that out-of-state projects aren't going to be as good as they could be. Managers aren't going to be able to use the best available methods to

accomplish things like ensuring regeneration, especially of species that need full sun, of managing for the impact of dear browsing, which can just devastate young trees that are regrowing, and also for creation of habitat in the northeast. Early successional habitat for song birds is very important. This is an important tool that can be used to create that. *(SIGLLC-3)*

> **Response:** ARB selected the California Forest Practice Rules as an appropriate standard because the existing even-aged management requirements in the Forest Protocol adopted by the Board in 2011 were based on the California Forest Practice Rules. One of the goals of the compliance offset program is to encourage the spread of California's high sustainability standards to other states. The compliance offset program is a voluntary program in which entities choose to participate. The implementation of the program requires equitable standards that can be applied equally across all states. The California Forest Practice Rules is the basis for these equitable standards regarding even-aged management. It is not practical for ARB to adopt the standards of every state or region when establishing minimum standards for participation.
>
> To the extent feasible, the protocol includes environmental safeguards to help ensure the environmental integrity of forest offset projects, which include requirements for projects to demonstrate sustainable long-term harvesting practices, limits on the size and location of even-aged management practices, and requirements for natural forest management. All projects are required to use management practices that promote and maintain native forests comprised of multiple ages and mixed native species at multiple landscape scales. Projects are still able to employ even-aged management practices to address a variety of issues including deer browsing and regeneration. The intent of the protocol is to incentivize practices that increase carbon stocks. When implementing projects under the protocol, projects must change their management practices. The limits on even-aged management are one factor offset protocol developers must consider when managing their project forest.
>
> Even-aged management causes changes to ecosystems, bringing in new and different flora and fauna than previously existed. Therefore, placing limits on even-aged management maintains and enhances the existing natural species, rather than facilitating a change in species composition through larger size cuts. This would not have an environmental impact because these new species currently do not exist in the stand prior to even-aged management.

C-4.30. Comment: One of the problems that we've been seeing lately has to do with even-age management. We see the verifier interpretation of harvest that exceed 40 acres, the landowner gets questioned. And the type of even-age management is

a thinning. Well, it is a type of even-age management, but it certainly wasn't the intent of the protocol back when we put it together to constrain that type of a harvest.

So clarification is needed. What we're seeing with verification is that it's moving from any kind for forester judgment, or professional judgment, to a literal interpretation of the protocol. And that means that we have to be real clear in the protocol. And to avoid problems like this, I commend ARB staff for taking on these issues of even-age management, for taking on some of the other issues of the financial constraints and trying to act clarity to it.

Now that being said, I am in agreement with some of the other previous speakers that the target was just missed by a little bit, in terms of trying to hit the forest practice rules.

And in the spirit of offering a solution, what we did at the reserve is we put together some suggestions, just little nudges to the current language on how that can be made better, so that it wouldn't pose the same sort of barrier that you're hearing today that has to do with the definition of even-age management, with the buffers and all of those things.

I think just a little nudge to the language can make it a lot better. So we are here to help on that and hopefully our suggestions will be helpful. *(CAR-3)*

> **Response:** This comment is general in nature, and therefore, ARB can only answer in a general manner. The even-aged management provisions were harmonized to the California Forest Practice Rules as directed by the Board at the December 2014 Board hearing, and were reviewed by the California Board of Forestry and the Department of Forestry and Fire Protection for conformance with the California Forest Practice Rules.
>
> As directed by the Board at the hearing to adopt the Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. Even-aged management will be a major focus of this guidance.
>
> Additional comments by the Climate Action Reserve are addressed throughout this document.

C-4.31. Comment: The proposed 15-day modifications include specific changes that could weaken the Forest Protocol even further, primarily with respect to clearcutting and even-age management. The following comments are directed to those proposed changes, with the intention of clarifying or strengthening those provisions.

(16) “Clearcutting” means a regeneration method involving the removal of a stand in one harvest. Regeneration after harvesting shall be obtained by direct seeding, planting, sprouting, or by natural seed fall. When practical, clearcuts shall be irregularly shaped and variable in size to mimic natural patterns and features found in landscapes.

Section 1.2 includes a new definition of clearcutting. To more accurately reflect the operational reality of commercial timber operations, this definition should be expanded to clarify that removing a stand does not mean removing every single tree. Under the definition proposed in the 15-day modification, a harvest that removes every tree but one would not qualify as a clearcut, although most clearcuts leave some residual trees for various reasons other than shelterwood or seed tree. One option would be to clarify that clearcutting means a regeneration method other than a seed tree or shelterwood cut involving the removal of most or all of a stand.

In addition, the sentence regarding irregular shape is inadvertently misleading and counterproductive. Forest clearcuts do not mimic natural disturbance, and it is unsupported and highly misleading to imply they can. We know of no scientific basis for asserting that an irregular shape or variation in size in any way mitigates the negative ecological impacts of clearcutting. While a single, smaller clearcut unit on its own damages less forest than a larger one, this assumes the timber operator does not create more clearcut units as a result. Furthermore, the directive "to mimic natural patterns and features found in landscapes" is ambiguous and unenforceable, and there is no basis for this approach. This requirement would need to be defined in quantitative measures to have practical meaning. We strongly recommend eliminating the sentence entirely, or at least removing the implication that forest clearcutting can mimic natural patterns and features. *(CBD-1)*

> **Response:** ARB staff agrees with the commenter that practices that result in the removal of all or most of the trees in a stand should be considered even-aged management in most instances. Clearcutting is only one of many even-aged silvicultural practices specified in the Forest Protocol. The definition of “Even-Aged Management” includes the provision that stands that do not meet the stocking requirements of subchapter 3.1(a)(4)(D) are also considered even-aged management. This has the intended effect the commenter was looking for of capturing stands where only a few trees remain after harvest.
>
> The definition of clearcut comes from the California Forest Practice Rules, which the even-aged management provisions of the Forest Protocol have been harmonized with, as directed by the Board at the December 2014 Board hearing; therefore, staff does not agree that the requirement to mimic natural patterns and features found in landscapes should be removed.

C-4.32. Comment: The definition of clearcutting: The current definition refers to the "removal of a stand in one harvest". We recommend amending the language to the "removal of all or most of the trees in a stand in one harvest. It is considered an even-aged regeneration harvest if it is below the retention level cited in the (new – see Comment 3) definition of Even-aged Regeneration Harvest". This will add clarity to the definition and ensure that the focus of verification is on even- aged regeneration harvests. It is not the intent of the even-aged management limitations to restrict even-aged harvests that are stocked, according to the definitions provided in the updated language in Section 3.1(a)(4)(D), following harvest. Additionally, the requirement that clearcuts be 'irregularly shaped and variable in size to mimic natural patterns and features found in landscapes' should be removed or phrased as a recommendation since it is subjective and will result in verification challenges. Additional verification costs will sharply reduce project participation. *(SIGLLC-2)*

> **Response:** ARB staff agrees with the commenter that practices that remove all or most of the trees in a stand should be considered even-aged management in most instances. Clearcutting is only one of many even-aged silvicultural practices specified in the Forest Protocol. The definition of "Even-Aged Management" includes the provision that stands that do not meet the stocking requirements of subchapter 3.1(a)(4)(D) are also considered even-aged management. This has the intended effect the commenter was looking for of capturing stands where only a few trees remain after harvest.
>
> A clearcut that removes all or most of the trees would be included under the even-aged management definition either by the definition of clearcutting or by going below the required stocking levels in subchapter 3.1(a)(4)(D); therefore, no change to the clearcutting definition is necessary. ARB staff agrees that once an even-aged management section is acceptably stocked, adjacent stands may be harvested.
>
> The definition of clearcut comes for the California Forest Practice Rules which the even-aged management section has been harmonized with at the direction of the Board at the December 2014 Board hearing, so staff does not agree that the requirement for clearcuts to be irregularly shaped and variable in size to mimic natural patterns and features found in landscapes should be removed.

C-4.33. Comment: While we recommend that the Board follow the suggestion proposed in the Pacific Forest Trust (PFT) comment letter, our experience and dedication to the success of ARB's program compels us to provide the Board with additional rationale concerning the negative ramifications of the proposed changes. As such, we request that the Board direct staff to organize a technical working group process to allow for a more robust discussion concerning three significant components of the proposed update to the Protocol. These three proposed changes

as they stand will result in reduced environmental and ecological benefits, dramatically reduced offset supply, higher compliance costs and increased ARB staff time.

1. Modified Even-aged Management and harvest buffer requirements – Chapter 3.1(a)(4)(A-E)

   Though the new Even-aged Management requirements are an improvement from those suggested in the previous iteration of the Regulatory Review Update of the Forest Protocol, there are still significant problems with the language defining Even-aged Management and the processes involved in confirming stocking levels and buffer size.

   The current Even-aged Management definition is incongruous with accepted silvicultural practices in many areas of the country, where larger scale regeneration cuts are necessary for promoting healthy forest regeneration. As the program is designed to encourage forest participation around the country, promote healthy forests and galvanize support for cap-and-trade expansion in other states, it is counterproductive to enshrine rules that would impede the enrollment of forests outside of California or that are less environmentally beneficial for many forests.

   Beyond definition issues, the updated Protocol's processes outlined for verifying a forest's adherence to stocking and buffer standards are not sufficiently explicit and lack the clear guidance required by verifiers to make confident determinations about a project's compliance. This will lead to potentially dramatic increases in verification time and cost. This ambiguity will also require a significant commitment of ARB staff time, as staff will need to respond to verifiers' questions as they attempt to carryout verifications in conformance with these new standards.

   <u>Proposed Solution:</u>

   Direct ARB to convene a working group to establish harvest and buffer restrictions appropriate for forests nation-wide. *(BLUESOURCE-5)*

   Response: ARB staff disagrees that the even-aged management requirements for stocking, buffers, and verification are not sufficiently explicit. The even-aged management requirements were harmonized with the California Forest Practice Rules as directed by the Board at the December 2104 Board hearing. There are prescriptive requirements for harvest size, buffer area, and stocking levels in subchapter 3.1(a)(4). Subchapter 8.1(b)(2)(E) also contains prescriptive verification standards for the

determination of stocking levels that the verifiers must apply using professional judgment, to determine with reasonable assurance that stocking levels have been met.

In addition, as directed by the Board at the hearing to adopt the Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. Any further guidance on the even-aged management requirements will be based on the California Forest Practice Rules.

The environmental aspects of these comments are addressed in Attachment A

C-4.34. Comment: We believe the standards contained in the current protocol (which are modeled after the California Forest Practice Rules (CFPR)) promote sound forest management while maintaining timber inventory levels that are higher than "business as usual". Timberland owners are required to make long-term commitments to participate in this program. It is therefore disconcerting that technical aspects of the protocol are being modified so soon after its adoption.

It is our understanding that ARB staff intended to add language to the protocol that mirrored the CFPR to provide regulatory guidance to out of state project proponents and verifiers. Unfortunately, some of the proposed changes do not exactly match the CFPR and will have unintended consequences on California forest projects.

Green Diamond Resource Company has co-signed a letter with several other organizations and landowners requesting removal from consideration three portions of the proposed US Forest Offset Protocol update, and associated definitions. *(GDRC-3)*

Response: ARB staff disagrees that the even-aged management requirements are not harmonized with the California Forest Practice Rules as directed by the Board at the December 2014 Board hearing. The even-aged management requirements were reviewed by the California Board of Forestry and the Department of Forestry and Fire Protection for conformance with the California Forest Practice Rules. Neither agency identified any concerns with the requirements.

The prescriptive requirements for harvest size, buffer area, and stocking levels in subchapter 3.1(a)(4) can all be found in the California Forest Practice Rules. The verification requirements also contain prescriptive standards (subchapter 8.1(b)(2)(E)) that the verifiers must apply, using

professional judgment, to determine if stocking levels that come from the California Forest Practice Rules have been met.

In addition, as directed by the Board at the hearing to adopt the Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. Any further guidance on the even-aged management subchapter will be based on the California Forest Practice Rules.

C-4.35. Multiple Comments: Verification Approach to Harvest & Buffer Size: In the 15-day update, ARB's revised Forest Protocol now features several vague and problematic areas related to the verification of harvest and buffer size for even-aged management retention stocking standards. For instance, the new procedure will increase the cost and time requirements for site verifications. The proposed approach excludes how many harvests must be examined in order to confirm that harvest size and buffer requirements have been met across the project. This will force verifiers to unnecessarily examine a potentially excessive number of harvested stands. Another example is that the new procedure contains unclear language about how the area of separation between harvests is to be calculated, and how to assess the basal area requirement during full verifications. The lack of clarity and guidance will naturally lead to confusion, inefficiencies and higher costs/resource requirements borne by all parties – including project proponents, verifiers, and ARB Staff. *(IETA-2)*

Comment: But you have an excellent set, in our opinion, of substantive written comments from Blue Source, from Climate Action Reserve, Pacific Forest Trust, Verifiers and others. And has already been pointed out to some extent, the amendment package still misses the mark in a couple of areas.

And I've got it boiled down to three basically. There's still requirements of the Forest Practices Act's rules that are not in the protocol. So the clarity wasn't provided, which will add time and cost for the registrant and the verifiers that's unnecessary.

There's still language that's inconsistent with the Forest Practices Rules. And third, there's proposed changes, some of which have already been alluded to in the first couple speakers that have subjective requirements associated with them. That's going to also add unnecessary -- in our opinion, unnecessary costs and time for the registrant, the verifiers, and the offset staff to plow through what an appropriate response to a subjective requirement might be. *(CFA-4)*

Response: ARB staff disagrees that the 15-day version of the protocol contains unclear language. ARB staff worked closely with the Department of

Forestry and Fire Protection and Board of Forestry to ensure harmonization with the California Forest Practice Act. The protocol's verification requirements contains prescriptive standards (subchapter 8.1(b)(2)(E)) that the verifiers must apply, using professional judgment, to determine if stocking levels that come from the California Forest Practice Rules have been met. Pursuant to section 95977.1(b)(3)(L) of the Regulation, verifiers are required to use professional judgment based on evaluation of a variety of risk factors when developing the sampling plan identifying what stands should be sampled.

With regard to buffer requirements, Subchapter 3.1(a)(4) contains the same 300-foot buffer requirement (separation between harvest) that can be found in the California Forest Practice Rules. For determining the separation between even-aged harvests, subchapter 3.1(a)(4)(B) of the Forest Protocol contains both an area and linear metric that are applied together. The buffer "shall be separated by at least 300 ft. in all directions" and the total area of the buffer around an even-aged managed must sum to the acreage requirement. The verifier will have to make two determinations: 1) is there at least 300 linear feet in all directions from the even-aged harvest, and 2) does the total area around the harvest meet or exceed the acreage requirements of the protocol. The linear requirement alone is not sufficient because alone it would not ensure an adequate buffer under all conditions. These requirements provide a clear standard to verify against.

In addition, as directed by the Board at the hearing to adopt the Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. Any further guidance on the even-aged management requirements will be based on the California Forest Practice Rules.

C-4.36. Comment: I would point out that I do think that the staff is working hard, but also as we have suggested, they're being asked to do a Herculean task. And it does not surprise me that when they contacted CalFire, that CalFire suggested that your current protocol language looked like their language. It does look like their language.

Unfortunately, because they aren't practitioners under the language, they wouldn't notice the subtle but very important technical differences between the protocol and the full language that's in the Forest Practice Rules.

A fairly simple one, when we plant a site, we have an option under the State law to bring the inspector out and say it is obviously stocked. It saves a tremendous amount of actual field verification and plots. That small sentence of waiver is inside

the two pieces of text that staff picked up to establish what the stocking requirements were in the Forest Practice Rules, leaving out the biggest cost saving in the actual regulation for individuals.

So the verifier stuck with language that now suggests that you have to have plots for verification of stocking when you can obviously see that a site is stocked. That's just one example, but that's the kind of important piece that a stakeholder work group, including forestland owners and practitioners, would have identified and did immediately in the two weeks we were given to read the new rules.

But that's where the -- both the agencies might not have seen that that language was missing. So just an example of I think the process that we're involved in. I would urge that the Board do approve the rice protocol, do approve the inclusion of Alaska, and I would urge the Board establish a quick turn-around time for a stakeholder work group to be able to provide that high technical expertise that's required to really bring this into alignment with the Forest Practice Rules. *(SPI-4)*

> **Response:** ARB staff disagrees that the 15-day version of the protocol contains unclear language. ARB staff worked closely with the Department of Forestry and Fire Protection, and Board of Forestry to ensure harmonization with the California Forest Practice Act. ARB staff disagrees that the agencies responsible for enforcing the California Forest Practice Rules are not the most appropriately qualified to review ARB's Forest Protocol. These agencies' staff are responsible for creating, providing guidance on, and enforcing the California Forest Practice Rules.
>
> The protocol's verification requirements contains prescriptive standards in subchapter 8.1(b)(2)(E) that the verifiers must apply, using professional judgment, to determine if stocking levels that come from the California Forest Practice Rules have been met. Pursuant to section 95977.1(b)(3)(L) of the Regulation, verifiers are required to use professional judgment based on evaluation of a variety of risk factors when developing that sampling plan identifying what stands should be sampled. ARB staff determined it was not necessary or appropriate to include the waiver requirement the commenter identified because the verifier can make the same determination using their professional judgment as allowed under section 95977.1(b)(3)(L) of the Regulation. Additionally, the waiver would only be applicable to California because it is issued by a California inspector, which may put projects in other states at a disadvantage.
>
> In addition, as directed by the Board at the June 25, 2015, hearing to adopt the Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be

released for public comment prior to finalizing. Any further guidance on the even-aged management requirement will be based on the California Forest Practice Rules.

C-4.37. Multiple Comments: Countable Trees Definition: (Chapter 1.2 Definitions): “Countable Trees" are currently defined as "trees that must be in place at least two growing seasons and must be live and healthy”. Although these “countable trees” must be measured, no clear definition exists about what constitutes a "healthy" tree. The ambiguity could result in verification problems when determining which trees are acceptable to be counted. IETA recommends that a clear definition for the word “healthy” be included as to avoid verification problems when determining which trees are acceptable to be counted. *(IETA-2)*

Comment: Definition of Countable Tree (page 4): We recommend adding the following reference from the California Public Resources Code for a “healthy” tree: PRC 4528(b). *(SIGLLC-2)*

Response: The definition of healthy was not included because it is a commonly understood forestry term indicating a tree capable of growth. As directed by the Board at the June 25, 2015, hearing to adopt the Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. Any further guidance on the even-aged management requirements will be based on the California Forest Practice Rules. As part of this process any necessary clarifications, including how to determine healthy trees, will be included.

C-5. Logical Management Unit (LMU)/ Minimum Baseline Level (MBL)

C-5.1. Comment: We are concerned that ARB’s new proposed method for determining minimum baseline level (MBL) for Improved Forest Management (IFM) projects with initial carbon stocking (ICS) above common practice (CP) will run counter to building a robust and functional offsets market in California.

ARB’s proposed approach for determining MBL for IFM discourages landowners from establishing forest projects on their most stocked/harvested acres because it does not provide full credit for the carbon sequestered in these areas. In addition, the rule change proves impractical for implementation and becomes difficult to effectively verify due to increased inventory and monitoring requirements.

In light of the above, IETA recommends that ARB's previous Forest Protocol's method of establishing MBL for IFM projects with ICS above CP should be maintained and included in the revised updated protocol. *(IETA-2)*

> **Response:** ARB staff disagrees with the commenter's suggestion that the new minimum baseline approach should be removed and is not justified. ARB staff determined that the new minimum baseline approach aids in preventing project operators from only selecting their highest stocked lands for participating in the protocol at the expense of their other forest holdings.
>
> ARB staff also disagrees that the new minimum baseline will be impractical to implement and difficult to verify. Equation 5.5 clearly defines how the minimum baseline is calculated. Equation 5.5 requires three values to determine the minimum baseline. The initial carbon stocks (ICS) value is a required part of the inventory for all projects; therefore, would require no additional monitoring or verification additional to current requirements. The Common Practice (CP) value is obtained from a lookup table in the assessment area data file on the ARB website. The weighted above-ground standing live tree carbon stocks (WCS) is obtained from measured and verified carbon stocks on the project as well as measured and verified carbon stocks on other lands owned by the Forest Owners in the LMU. The LMU, at most, is the same assessment area as the project but can be further limited by its unique biological, geographical, and/or geological attributes, delimited by watershed boundaries and/or elevational zones, and/or unique road networks, and/or an area that has experienced natural disturbance such as wildfire or windstorm, and/or areas designated as High Conservation Value Forest (HCVF).
>
> There may be additional monitoring and verification requirements due to the requirements of the LMU, depending on how the LMU is defined. However, the benefit of preventing the "cherry-picking" of only the highest stocked lands merits the change. Without this change, project developers could receive credit for high stocked land without considering management practices on their other land. Projects should not receive "full" credit for their high stocked lands without considering the practices that occur on their other lands. Projects will receive ARB offset credits for all verified GHG emission reductions and removal enhancements meeting the requirements of the protocol and Regulation.

C-5.2. Comment: Our specific concerns with the proposed revisions are as follows:

The proposed changes to the process for calculating Minimum Baseline Level for projects with starting stocks above Common Practice is a barrier to large landowners placing portions of their property into a carbon project in order to protect old-growth

and other well-stocked stands and will have a negative impact on utilizing carbon as a conservation tool for subsections of a large property. *(BPAI-1)*

> **Response:** The protocol does not provide any barriers to large land owners; it only requires them to consider all their landholdings within the LMU when setting the project baseline. What the protocol is trying to prevent is only putting the highest stocked lands into a project while leaving other more modestly stocked lands out. Without this change, project developers could receive credit for high stocked land without considering management practices on their other land.
>
> In the 15-day modifications ARB staff has modified the definition of LMU to include areas designated as High Conservation Value Forest which could allow old-growth forest to be considered their own LMU, effectively reverting back to the minimum baseline equation in the previous version of the protocol as the commenter requested. Additionally, so as to not penalize owners of property subject to a natural disturbance, any area that has experienced a natural disturbance would be considered its own distinct LMU.

C-5.3. Comment: The Local Management Unit changes are inappropriate; there should be no new equation. A project that has higher than Common Practice and a verifier determines that Common Practice and lower carbon stocking is feasible; that should not generate a new equation. *(CFA-3)*

> **Response:** ARB staff disagrees with the commenter's suggestion that the new minimum baseline approach should be removed and is not justified. ARB staff determined that the new minimum baseline approach aids in preventing project operators from only selecting their highest stocked lands for participating in the protocol at the expense of their other forest holdings. Without this change, project developers could receive credit for high stocked land without considering management practices on their other land.

C-5.4. Multiple Comments: While the previous definition of a Logical Management Unit is in need of clarification, the updated definition does not adequately clarify the term. A suggestion for an alternative definition is as follows:

"Logical Management Unit" or "LMU" means all landholdings or any subset of landholdings managed explicitly as a defined planning unit that the forest owner(s) and its affiliate(s) either own in fee or hold timber rights on, in which the landholdings or subunit of landholdings are within the same assessment area(s) where the project is located. An LMU may be characterized by its unique biological, geographical, and/or geological attributes, delimited by watershed boundaries and/or elevational zones, and/or unique road networks; by an area impacted by a natural disturbance such as a wildfire or windstorm; by distinct forest types (as defined in the USFS FIA

program) that fall within the same assessment area; and/or by a distinct woodshed. *(SIGLLC-2)*

Comment: ***2. New equation 5.5 and the Logical Management Unit definition are not narrowly targeted to prevent non-additional projects.*** The proposed changes will inaccurately prevent many additional, high-conservation value projects on sub-areas of timberland ownerships where there is a legitimate reason for such areas to contain higher stocking levels than the broader timberland holding. Such reasons include natural disturbances, materially different forest types that are included within the same assessment area by the protocol, management by non-industrial private forest landowners who harvest timber not according to a defined forest management plan but for discrete and irregular cash flow needs, among other causes. We recommend further technical discussion in a work group to flush out the appropriate way to define a Logical Management Unit to more effectively screen for non-additional projects while avoiding "false negatives" that prevent enrollment of truly additional projects. In the past, we have proposed the following definition:

"Logical Management Unit" or "LMU" means all landholdings or any subset of landholdings managed explicitly as a defined planning unit that the forest owner(s) and its affiliate(s) either own in fee or hold timber rights on, in which the landholdings or subunit of landholdings are within the same assessment area(s) where the project is located. An LMU may be characterized by its unique biological, geographical, and/or geological attributes, delimited by watershed boundaries and/or elevational zones, and/or unique road networks; by an area impacted by a natural disturbance such as a wildfire or windstorm; by distinct forest types (as defined in the USFS FIA program) that fall within the same assessment area; and/or by a distinct woodshed.

For non-industrial landowners, the project area may be considered its own LMU. Following USFS FIA and California state law definitions, non-industrial landowners shall be defined as: (1) Native American tribes; or (2) individuals or corporate landowners who, together with their affiliates, own fewer than 50,000 acres and/or timber rights within the same assessment area(s) in which the project is located. *(NFI-3)*

> **Response:** ARB staff disagrees that the LMU definition needs modification. It clearly defines the maximum extent of the LMU as the project area's assessment area which is identified in the Assessment Area Data File on the ARB webpage. The LMU can be further limited by its unique biological, geographical, and/or geological attributes, delimited by watershed boundaries and/or elevational zones, and/or unique road networks, and/or an area that has experienced natural disturbance such as wildfire or windstorm, and/or areas designated as HCVF. The result is a defined region which can be monitored and verified for the determination of the minimum baseline.

The LMU definition addresses the effects of natural disturbance as raised by the commenter. However, the definition of LMU does not treat any forest owner differently such as the non-industrial private forest landowner identified by the commenter. All projects must be held to the same standards regardless of ownership or management practices.

C-5.5. Comment: Minimum Baseline Level Requirements - Equation 5.5 and 5.6

The minimum baseline level equations are not scientifically justified and will have the consequence of ignoring one of the most efficient and effective methods for reducing GHG emissions, i.e. maintaining high-stocked mature forests. The protocol already has mechanisms in place to prevent issuing offsets to highly stocked mature forests that exist because of weak or absent timber markets, i.e. baselines must incorporate all legal constraints and financial considerations - 5.2.1(e)(1) & (2). In the same respect, forests that were heavily harvested immediately before considering participation will not be feasible as an offset project because of how the baseline is set, and the high stocking reference analysis.

We assert that Equations 5.5 and 5.6 (Minimum Baseline Level) can be written as:

Equation 5.5 should be MBL = CP

Equation 5.6 should be MBL = MAX(HSR, ICS).

This eliminates the confusion and increased verification and review costs associated with defining LMUs and WCS without compromising additionality upheld by the protocols method for modeling the baseline (i.e. incorporating all legal constraints and financial considerations - 5.2.1(e)(1) & (2)). *(FCC-3)*

Response: ARB staff disagrees with commenter's suggestion the new minimum baseline approach in equation 5.5 should be removed and is not justified. ARB staff determined that the new minimum baseline approach aids in preventing project operators from only selecting their highest stocked lands for participating in the protocol at the expense of their other forest holdings. ARB staff believes this update is necessary to ensure the integrity of the offset credits despite the possible increase to monitoring and verification costs. Without this change, project developers could receive credit for high stocked land without considering management practices on their other land.

ARB staff also disagrees that equation 5.6 should be modified. Equation 5.6 is unchanged from the protocol originally adopted by the Board in 2011 and was designed to prevent exactly what the commenter is recommending be allowed, which is heavily harvesting a forest immediately before commencing a project.

ARB staff does not agree that the definition of LMU, which is used in determining WCS, is confusing or will lead to increased verification costs. The definition clearly defines the maximum extent of the LMU as the project area assessment area which is identified in the Assessment Area Data File on the ARB webpage. The LMU can be further limited by its unique biological, geographical, and/or geological attributes, delimited by watershed boundaries and/or elevational zones, and/or unique road networks, and/or an area that has experienced natural disturbance such as wildfire or windstorm, and/or areas designated as HCVF. The result is a defined region which can be monitored and verified for the determination of the minimum baseline.

C-5.6. Multiple Comments: In addition, we would like to reiterate our concerns regarding the modified methods for establishing minimum baseline level (MBL) for IFM projects with initial carbon stocking (ICS) above Common Practice (CP) (Protocol Chapter 5.2.1(d)(1)), which we find to be similarly lacking in effective verification guidance, possibly leading to significant increases in the scope of verification. *(RCE-2)*

Comment: IETA particularly -- with this in mind, IETA particularly encourages ARB not to accept the new protocol system for the establishment of minimum baseline levels for improved forest management projects with stocking above the common practice level. The new system for establishment of minimum baseline levels does not serve to increase the robustness of the California program, and it will result in the exclusion of projects that would have -- that would have had meaningful climate and conversation benefits.

We acknowledge that ARB has expressed a desire to maintain standards equal to or more stringent than those seen in the voluntary market. As such, ARB feels obligated to make this baseline modification to mirror Climate Action Reserve's protocol. However, we argue that the most important goal of ARB's program is to maintain a system of rules that promotes the highest quality of forced offsets.

In this particular case, the addition of the minimum baseline rules does not improve offset quality, and therefore does not merit adoption into the compliance program. *(IETA-3)*

Comment: Second, just to comment briefly on the new method for calculating the minimum base-line level. We understand the motivation to address this, but we worry that the net effect is going to be to reduce the amount of land that comes into the program. Offset projects are complicated. It's not obvious, looking at a piece of land, whether or not it's going to make a viable project. And it can take a lot of work just to get to the decision point, whether you want to go forward with it or not.

From our perspective and in our experience, this complexity is a real barrier for entry. And without things as they stand right now with a certain amount of incentive for highly stocked land, landowners are going to be much more likely to pass on the opportunity. And that means we could end up with, you know, more greenhouse gas emissions not less. *(SIGLLC-3)*

> **Response:** ARB staff disagrees with commenter's suggestion that the new minimum baseline approach in equation 5.5 should be removed. ARB staff determined that the new minimum baseline approach aids in preventing project operators from only selecting their highest stocked lands for participating in the protocol at the expense of their other forest holdings. ARB staff believes this update is necessary to ensure the integrity of the offset credits despite the possible increase to monitoring and verification costs. Without this change, project developers could receive credit for high stocked land without considering management practices on their other land. The new approach will still allow IFM projects to receive full credit for increased carbon stocks above the baseline.
>
> Equation 5.5 clearly defines how minimum baseline is calculated. Equation 5.5 required three values to determine the minimum baseline. The ICS value is required to set the project baseline, and would be information the project operator would already have and the verifier already required to verify. The CP value is from a lookup table in the assessment area data file on the ARB website. And the WCS is obtained from measured and verified carbon stocks on the project as well as measured and verified carbon stocks on other lands owned by the Forest Owners in the LMU. The LMU, at most, is the same assessment area as the project but can be further limited by its unique biological, geographical, and/or geological attributes, delimited by watershed boundaries and/or elevational zones, and/or unique road networks, and/or an area that has experienced natural disturbance such as wildfire or windstorm, and/or areas designated as HCVF.
>
> As directed by the Board at the hearing to adopt the Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. The guidance will include a section on defining and verifying the LMU.

C-5.7. Comment: The modification to the minimum baseline level (MBL) calculation of the for improved forest management (IFM) projects where initial carbon stocks are above common practice is detrimental to the interests of the OPO and the ARB. Using the modified equation for MBL now requires that the weighted carbon stocks (WCS) be calculated for all forest projects, for those that are below common practice

and now likewise for those that are above common practice. The calculation of WCS is complicated and expensive; it requires an inventory of all OPO or affiliate owned forests or a high intensity stratified vegetation-type analysis. These further analyses, in addition to the associated increase in verification intensity, escalate the costs of project development and discourage forest owners from participating in the program. Please consider removing this amendment as the protocol already requires "sustainable and long-term harvest practices" be maintained on all forestland holdings controlled by the Forest Owner. *(ECOP-2)*

> **Response:** ARB staff disagrees with commenter's suggestion that the new minimum baseline approach in equation 5.5 should be removed. As the commenter notes, this bring the requirements for above Common Practice in line with those for below Common Practice. ARB staff determined that the new minimum baseline approach aids in preventing project operators from only selecting their highest stocked lands for participating in the protocol at the expense of their other forest holdings. So-called "cherry picking" of highest stocked lands would allow projects to receive credit for projects on high stocked land without considering the management practices on their other lands. ARB staff believes this update is necessary despite the possible increase to monitoring and verification costs. The analysis of WCS is limited to the LMU which is at most the Forest Owner's landholding in the limited range of the assessment area. The LMU can be further limited by its unique biological, geographical, and/or geological attributes, delimited by watershed boundaries and/or elevational zones, and/or unique road networks, and/or an area that has experienced natural disturbance such as wildfire or windstorm, and/or areas designated as HCVF.

C-5.8. Comment: All of the previous comments above were raised prior to the December 2014 board hearing. While the Board has made some changes to the definition of even-aged management since then, none of the remaining items were addressed, nor has the Board responded to our comments. While we understand that the Board receives numerous comments, these are items that numerous other stakeholders are concerned about, as well.

Rather than adopting the problematic changes highlighted above, we urge the Board to direct staff to organize a technical work group process to allow for a more robust discussion of proposed amendments to the Forest Protocol and produce language that more accurately and efficiently addresses the perceived matters of concern. *(ECOP-2)*

> **Response:** Comments received during both the 45- and 15-day rulemaking processes are addressed in the Final Statement of Reasons prepared after Board adoption. The remainder of EcoPartners' comments are addressed throughout this document.

ARB staff supports the use of technical workgroups and intends to use them in future protocol development. In addition, as directed by the Board at the hearing to adopt the Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. ARB staff invites all interested stakeholders to participate.

C-5.9. Comment: Unfortunately, the amendments presented in the current 15-day draft of this Regulatory Review Update are not yet ready to adopt. Their inclusion will not enhance the stringency or environmental value of the Forest Protocol as written; instead these changes will add confusion, uncertainty, and unnecessarily burdensome process for ARB staff and program participants. In addition, some changes create needless barriers to the important conservation of carbon rich forests that remain on the landscape. The Forest Protocol so far has played an important role in conservation of older forests with higher carbon stocks and already has stringent terms to prevent the crediting of non-additional stores. *(PFT-3)*

Response: The changes to Common Practice values have added additional scientific rigor to the protocol by basing updated Common Practice values on more, new, and better data collected by FIA. The change to the minimum baseline calculation has increased the environmental integrity of the protocol by preventing project operators from choosing only the highest stocked lands at the expense of other forest holdings. Modifications to even-aged management requirements have provided additional clarity of how harvests should be evaluated. The numerous other modifications throughout the protocol each facilitate implementation and enhance clarity. These requirements are necessary to assure all offsets credits generated are real, additional, permanent, quantifiable, verifiable, and enforceable as required by AB 32.

C-5.10. Comment: Modified Minimum Baseline Level determination process for IFM projects with initial stocking above common practice – Chapter 5.2.1

The new method for determining minimum baseline level (MBL) for IFM projects with initial carbon stocking (ICS) above common practice (CP) will run counter to the program's climate goals. If a landowner is forced to use a MBL above CP, due to lower stocking levels on other holdings in the same assessment area, a carbon project may not be feasible. This approach disincentivizes landowners from establishing forest projects on their most highly stocked (and likely to be harvested) acres and thereby forgoes the meaningful climate benefits that would have been associated with preventing aggressive harvesting on these acres for the next 100+ years.

In addition, this rule change will be impractical for implementation and extremely difficult to verify. At the center of the problem is the concept of the logical management unit (LMU), which defines the bounds of the geographic region over which a landowner must consider stocking levels on their other holdings outside the Project Area. Unfortunately, the method prescribed for determining the LMU requires extensive additional data collection on the part of the landowner (which will often be cost prohibitive) and necessitates an excessive number of subjective judgments. Once the LMU is established, the process of verifying the bounds, stocking, and management on the LMU will cause the cost and time involved in project verification to balloon, and may make verification practically impossible. Indeed, in cases where the LMU extends over an acreage many times the scale of the project area itself, the cost and difficulty of verification will likely compel landowners to abandon any consideration of participating in the program. In addition to dramatically increased costs, verifiers and project participants will need to frequently ask for ARB staff's guidance and approval given the subjective nature of the new requirements.

A technical issue of particular concern in the MBL establishment process can be found in the Protocol's methodology for utilizing the "stratified vegetation-type analysis" approach to calculating weighted carbon stocks across an LMU. In order to utilize this approach, Table 5.2., Vegetation Classes for Stratification, (page 60) must be applied. However, the Carbon Rating column of the table, which is supposed to list average CO2e/acre for various DBH classes, appears to list carbon/acre values instead, which are less than a third of the weight of the CO2e values that should be present. Additionally, even if the CO2e values were corrected, the table would still not provide appropriate values for highly stocked stands. For instance, for most redwood and Douglas-fir stands in the Pacific Northwest the average CO2/acre can be well over 250 tonnes CO2/acre, whereas the maximum carbon rating of 175 mt CO2/acre (assuming the table units are converted to CO2e/acre) is much too low to accommodate this high CO2/acre forest type. Ultimately, these problems make the "stratified vegetation-type analysis" process completely unworkable.

<u>Proposed Solution:</u>

The previous Protocol's method of establishing MBL for IFM projects with ICS above CP (equation 6.5 of the October 2011 Protocol) should be maintained and incorporated into the revised Protocol in place of equation 5.5. As both the existing and proposed protocols already require "sustainable long-term harvest practices" (certification, renewable long-term management plan, etc.) be maintained on all land holdings controlled by a Forest Owner, concern over potential for ecologically irresponsible management outside a project's bounds should be adequately addressed without the introduction of further regulatory hurdles and complexity.

If the new MBL requirement is maintained, we support the modification of the definition of LMU suggested in the Climate Action Reserve's comment letter– "Logical Management Unit" or "LMU" means all landholdings or any subset of landholdings managed explicitly as a defined planning unit that the forest owner(s) and its affiliate(s) either own in fee or hold timber rights on, in which the landholdings or subunit of landholdings are within the same assessment area(s) where the project is located. An LMU may be characterized by its unique biological, geographical, and/or geological attributes, delimited by watershed boundaries and/or elevational zones, and/or unique road networks; by an area impacted by a natural disturbance such as a wildfire or windstorm; by distinct forest types (as defined in the USFS FIA program) that fall within the same assessment area; and/or by a distinct woodshed. *(BLUESOURCE-5)*

Response: ARB staff disagrees with commenter's suggestion that the new minimum baseline approach in equation 5.5 should be removed. ARB staff determined that the new minimum baseline approach aids in preventing project operators from only selecting their highest stocked lands for participating in the protocol at the expense of their other forest holdings. Without this change, project developers could receive credit for high stocked land without considering management practices on their other land. ARB staff believes this update is necessary despite the possible increase to monitoring and verification costs.

The analysis of WCS is limited to the LMU, which is at most the Forest Owner's landholding in the limited range of the assessment area. ARB staff disagrees that the LMU definition needs modification. It clearly defines the maximum extent of the LMU as the project area assessment area which is identified in the assessment area data file on the ARB webpage. The LMU can be further limited by its unique biological, geographical, and/or geological attributes, delimited by watershed boundaries and/or elevational zones, and/or unique road networks, and/or an area that has experienced natural disturbance such as wildfire or windstorm, and/or areas designated as HCVF. The result is a defined region which can be monitored and verified for the determination of the minimum baseline. Finally, the comment regarding climate benefits is addressed in Attachment A to this FSOR.

ARB staff agrees that the units are incorrect in table 5.2 and have made nonsubstantive changes to correct the units. The values are meant as a unit-less, representative and conservative alternative to collecting actual inventory data for the LMU, and therefore may not accurately reflect all forest types, but the project operator always has the opportunity to obtain and use inventory data for these forest types instead of the default values.

C-6. Common Practice

C-6.1. Multiple Comments: In the new protocol, ARB's proposed new CP values do not accurately reflect forest stocking resultant from truly "common practice" forest management because they do not account for the cyclical components of the timber market contributing to high/low demand fluctuations and forest stocks[17].

Setting CP values based on forest stocking levels based on abbreviated time periods will lead to less than optimal forest carbon sequestration and reduced climate benefits. When baselines are set artificially high based on periodic downward market fluctuations and demand for timber surges, there will be even less incentive for landowners to implement carbon projects, leading to the harvesting of forests rather than seeing them stand for 100+ years.

To better represent "common practice" forest stocking resulting from BAU forest practices, IETA recommends that CP values are based on average stocking levels over an extended time horizon. For instance, stocking averaged over a time period of up to 25 years (i.e. the same length as a project crediting period) would account for timber market fluctuations and avoid discouraging projects during periods when motivation to harvest is highest.

Once the method for calculating CP values is agreed-upon, IETA urges ARB to establish a set and transparent process – including a timetable for the release, public review, and eventual implementation of proposed changes – to guide the regular update of these CP values. *(IETA-2)*

Comment: There are technical issues with the proposed amendments.

Examples of technical issues are:

- As increased improved forest-management projects are undertaken, they will influence the Forest Inventory and Analysis (FIA) information. That should not change the "Common Practice." The increase in stocking is not Common Practice but rather the result of increased stocking levels due to registered projects that come with 100-year permanence commitments to maintain Common Practice stocking levels plus committed carbon offset volumes.
- When market conditions are such that less harvest occurs, standing inventory will rise; hence, Common Practice should incorporate "averaging." *(CFA-3)*

[17] Updated CP values are based exclusively on FIA data collected over 2007-2012 – a short period of time and in the wake of the recession, when housing and associated timber demand were at historic lows. Capturing CP values during this time is an unrepresentative collection of high stocking levels for assessment areas across the country.

Comment: WSPA shares the concerns of other C/T stakeholders that ARB's proposed CP values, used to determine baseline timber stocking levels against which carbon removals are measured for individual projects, are based on data from an excessively narrow window in time that corresponds with the nation's unprecedented economic recession. During this period (2007-2012), housing starts and associated timber demand fell to historic lows. The new CP values generate baseline timber stocking levels that are artificially high (due to a temporary market fluctuation in the demand for timber), resulting in significantly lower volumes of ARB offset credits (ARBOCs) being issued for many forestry projects and rendering other projects completely unviable.

… To mitigate such presumably unintended outcomes, WSPA recommends that ARB adjust its proposed CP values based on average timber stocking levels over an extended time horizon. Timber stocking averaged over a 25 year period would more accurately account for fluctuations in the timber market. This adjustment would also minimize disincentives for offset projects during times when the motivation to harvest is highest. *(WSPA-1)*

Comment: Modified Common Practice figures and the associated shift in "high" vs "low" site class delineation - Assessment Area Data File associated with the Regulatory Review Update of the Forest Protocol and Appendix F(d), [With the exception of the addition of Alaska]

As we have stated in previous comment periods, the proposed new CP values do not accurately reflect forest stocking resultant from truly "common practice" forest management, as the values do not take into account cyclical components of the timber market which contribute to spikes and troughs in wood product demand and forest stocks. The new CP values are based exclusively on FIA data collected over a very brief window of time (~2007-2012) largely in the midst and wake of the Great Recession, when housing starts, and the associated timber demand, were at historic lows. The effect of capturing CP values during this time period constitutes an unrepresentative collection of high stocking levels for assessment areas across the country.

Setting CP values based on forest stocking levels at isolated points in time will lead to less than optimal forest carbon sequestration and reduced climate benefit. This is because when baselines are set artificially high based on periodic market fluctuations, and demand for timber surges, there will be even less incentive for landowners to implement a carbon project and stocks will be harvested instead of locked in for 100+ years. Following such market conditions, many forest carbon projects would not be attractive to landowners again until general stocks had subsided and baseline values were sufficiently lowered to allow for project viability.

<u>Proposed Solution:</u>

In order to better represent truly “common” stocking resultant from business-as-usual forest practices, CP values should be based on average stocking levels over an extended time horizon. Stocking averaged over a time period of up to 25 years (i.e. the same length as a project crediting period) would account for timber market fluctuations and avoid disincentivizing projects during times when the motivation to harvest is highest.

To establish a method of determining appropriate CP values, we recommend a technical working group, much like the one gathered for drafting the Rice Cultivation Protocol, be assembled.

Once the method for calculating CP values is agreed upon, a set process, including a timetable for the release, public review, and eventual implementation of proposed changes, should be adopted for the regular update of these values. This will avoid unpredictable shifts in baseline levels and market uncertainty. *(BLUESOURCE-5)*

Comment: We understand the ARB's conservative approach to offsets. However, WSPA shares the concerns of other cap-and-trade stakeholders that ARB's proposed common practice values used to determine baseline timber stocking levels are unreasonably high.

We recommend that ARB adjust the proposed common practice values based on the average timber stocking levels over an extended period of time. Timber stocking averaged over a 25-year period would more accurately account for fluctuations in the timber market. This adjustment would also minimize disincentives for offset projects during times when the motivation to harvest is highest. *(WSPA-2)*

Comment: The changes to the Common Practice values included in Appendix F(d) will also hinder the conservation of carbon rich forests. The new FIA data set from which the values have been derived is from an anomalous period of low timber harvest due to the Great Recession, yielding a notably higher Common Practice value for many assessment areas. In fact, the proposed update would only be representative of a condition that is already changing back to business as usual, where higher stocks on the ground are being logged with the revival of the housing market. Therefore, by instituting the new values for the baseline, the reference point for Common Practice is not an accurate metric.

By instituting the proposed changes to the CP value, owners of forests with greater carbon stores may no longer have an incentive to conserve them by being able to generate offsets. Rather, it is more likely these owners will avail themselves of the log market instead.

The current problematic amendment highlights the lack of clear process for updating the Common Practice values, which is not defined in regulation. There is no direction as to how and when to make reasonable updates, nor even a methodology to

address what time series to include using what statistical approach in order to keep the value representative of what Common Practice actually is and to prevent widely varying fluctuations in the value from period to period. We urge the ARB to establish an explicit policy and process for Common Practice value updates. *(PFT-3)*

Response: ARB staff disagrees that the new Common Practice values do not accurately reflect true stocking from common practice forest management. The data obtained from the FIA accurately reflects business-as-usual practice on forest land throughout the U.S. in recent years based on physical inventories of plots throughout the U.S., and therefore, reflects true common practice.

Resolution 11-32 directs ARB staff to periodically review and update compliance offset protocols. The proposed Common Practice values represent the most recent carbon stock data from FIA. The data was collected using the most recent scientific methods and is more comprehensive than the data set used to establish the existing Common Practice values. This is the first time ARB staff is proposing to change the Common Practice values since the protocol was first considered by the Board in December 2010.

Commenters state the data set used to calculate the proposed Common Practice values is unrepresentative of long-term forest timber demands because it includes the period of time spanning the recession, when single home family starts dropped dramatically and there was a low demand for forest timber. The existing Common Practice values span the general timeframe of 2001 to 2006. This includes the years of 2004 and 2005, which were an unprecedented period of high single-family housing starts and forest timber demand.

Based on publically available documents from The Department of Agriculture, domestic timber demand is generally on the decline. The transition to electronic from paper media, increased imports of furniture, and decreased demand for paperboard products all represent long-term structural changes in the wood sector economy. Furthermore, a review of historical single-family home starts for 2007-2012, the same time period as covered by the proposed Common Practice values, shows that single-family home starts for this time period are similar to long-term average single-family home starts over longer time periods spanning back to 1960. The FIA updates its forest inventory on a rolling basis of 5, 7, or 10 years, so that the majority of recent data for the Common Practice values comes from the 2007-2012 timeframe. This suggests the proposed Common Practice values are more representative of long-term trends in timber demand and the current Common Practice values

are representative of an anomalous period of high and unsustainable growth in the home construction sector.

The commenter's suggestion of averaging Common Practice values over 25-years is not technically possible. The Agricultural Research, Extension, and Education Reform Act of 1998 (Public Law 105–185), also known as the 1998 Farm Bill, prescribed conceptual changes in approaches to forest inventories conducted by the FIA. The enhanced data from FIA used to determine the Common Practice values does not go back 25 years, and changes in volume and biomass equations does not allow for comparison of data from other inventory cycles.

ARB staff participated in a webinar on October 14, 2014, where a representative from the FIA provided detailed information about the development of the Common Practice values, including the public location of all data used (http://www.fia.fs.fed.us/tools-data/), and explained how the data was used to calculate the Common Practice values provided to ARB by FIA. A copy of the presentation can be found on the ARB website at: http://www.arb.ca.gov/cc/capandtrade/meetings/101414/acr.webinar.us.forestry.slides.pdf. Additional details concerning ARB's process for the current proposed update is found in ARB's response to Comment C-3.1.

Stakeholders, including this commenter, have requested a predictable schedule for future Common Practice updates and additional data leading to the Common Practice updated values. ARB staff agrees with the need to provide a predictable schedule, and will determine a reasonable timeline for future Common Practice updates after consultations with the FIA and with stakeholders.

Blue Source comments that setting Common Practice values based on forest stocking levels at isolated points in time will lead to less than optimal forest carbon sequestration and reduced climate benefit. This environmental comment is addressed in Appendix A to this document.

C-6.2. Comment: CCEEB has two chief technical concerns. The first relates to ARB's proposed CP values used to determine baseline timber stocking levels against which carbon removals are measured for individual projects. The proposed protocol change relies on data from an excessively narrow window in time that corresponds with California's unprecedented economic recession. During this period (2007-2012), housing starts and associated timber demand fell to historic lows. The new CP values generate baseline timber stocking levels that are artificially high (due to a temporary market fluctuation in the demand for timber), resulting in significantly lower volumes of ARBOCs being issued for many forestry projects and rendering other projects completely unviable. The second issue is that the proposed

even-aged management provisions could disadvantage out-of-state forestry projects relative to in-state projects18, dividing the forestry offset developer community, discouraging investment in out-of-state projects and further limiting the pool of offsets that would otherwise be derived from forestry projects. Again we see inequity as an unintended consequence that will likely have a negative impact on the offsets market by creating uncertainty and undermining reasonable expectations.

To address these concerns, CCEEB asks that ARB staff hold a workshop to receive and consider stakeholder comments with regards to the CP value changes. Additionally, the potential economic and compliance impacts of new CP values should be analyzed and presented publically. In order to avoid some of the supply concerns with ARB's proposal, CCEEB suggests that CP values be based on average stocking levels over a 25-year period in order to account for market changes, such as a recession, that the newly proposed CP values are based on.

We believe the process and timeline for updating the assessment area data file and site classification groupings could be clearer. Without transparency in the process, analysis, and trade-offs considered by staff in formulating these protocol updates, the market may be confused regarding the objectives that ARB is pursuing. *(CCEEB-1)*

> **Response:** The comment regarding Common Practice values is addressed in ARB's response to Comment C-6.1.
>
> ARB staff disagrees that the even aged management requirements of the protocol would disadvantage out-of-state forestry projects relative to in-state forestry projects. One of the reasons the even-aged management requirements were clarified was to ensure all projects were meeting the same standards. With one set of prescriptive standards, all projects, in- or out-of-state, will be on a level playing field. With the point-based system and the residual basal area system, there are now two methods for determining adequate stocking.
>
> ARB's steps to engage stakeholders in the current proposed protocol update process is addressed in ARB's response to Comment C-3.1.

[18] Though the new Even-aged Management requirements are an improvement from those suggested in the previous iteration of the Regulatory Review Update of the Forest Protocol, there are still significant problems with the language defining Even-aged Management and the processes involved in confirming stocking levels and buffer size. The current Even-aged Management definition is incongruous with accepted silvicultural practices in many areas of the country, where larger scale regeneration cuts are necessary for promoting healthy forest regeneration. As the program is designed to encourage forest participation around the country, promote healthy forests and galvanize support for cap-and-trade expansion in other states, it is counterproductive to enshrine rules that would impede the enrollment of forests outside of California or that are less environmentally beneficial for many forests.

Stakeholders, including this commenter, have requested a predictable schedule for future Common Practice updates and additional data leading to the Common Practice updated values. ARB staff agrees with the need to provide a predictable schedule, and will determine a reasonable timeline for future Common Practice updates after consultations with the FIA and with stakeholders.

C-6.3. Comment: The process for classification of high and low site class for determining common practice lacks clarity. Item (d) in Appendix F uses the terms "site class productivity class" and "basal area growth" to define high and low site classes, yet does not cite or define these terms. Item (e) contradicts itself, providing four options for determining site class (soils data from state or federal agency, direct site class data from state or federal agency, attestation of state forester, or field analysis), and in the subsequent sentence requiring the Offset Project Operator (OPO) to demonstrate field analysis to determine high and low site class. Please clarify how site class is to be determined by the OPO. *(ECOP-2)*

Response: ARB staff believes that both terms are self-explanatory and do not require further definition. The site class productivity codes are values (I-VII) determined by the FIA according to the FIA Database Description and User Guide for Phase 2 (version: 6.0.1) to identify the productivity of the forestland. The basal area growth is the annual average basal area increase per acre of trees. Appendix F to the Forest Protocol provides four options for determining site class. Any option that is chosen by the project operator must be documented for the verifier. If the field analysis option is selected, then the method prescribed by the FIA Guide must be used.

C-6.4. Comment: The Common Practice Values in the updated assessment area data file vary greatly from those in the previous version, some demonstrating higher growth than expected over a short time period. EcoPartners previously asked the Board to include standard error calculations for all Common Practice Values in the assessment area data file. As no variance statistics have been included in the latest assessment area data file, we are unable to assess the accuracy of the new dataset. For the purpose of transparency and a better understanding of the new data, please consider including standard error of the common practice value in the assessment area dataset. *(ECOP-2)*

Response: Standard error calculations for the Common Practice values are not necessary because they are not used in any calculations in the protocol. ARB staff participated in a webinar on October 14, 2014, where representatives from the FIA provided detailed information about the development of the Common Practice including the public location of all data used (http://www.fia.fs.fed.us/tools-data/), and explained how the data was used to calculate the Common Practice values provided to ARB by FIA. A copy of the

presentation can be found on the ARB website at: http://www.arb.ca.gov/cc/capandtrade/meetings/101414/acr.webinar.us.forestry.slides.pdf.

C-6.5. Comment: ***1. Revisions to the Common Practice figures and site class breaks are technically accurate and necessary, but would benefit from additional technical discussion.*** New Forests recognizes that the Common Practice figures must be updated periodically to reflect updated data from the US Forest Service FIA system. However, we believe that the site class break chosen by the Forest Service to distinguish between "high" and "low" site was not correctly chosen and places the vast majority of working forests into "high" site class. We suggest that ARB consider discussing a more appropriate site class division with the US Forest Service and with stakeholders so that the landscape-level distribution of acreage in productive forestlands is more evenly distributed between the low and high site categories. We further suggest that ARB adopt a clear and consistent process for updating the Common Practice figures periodically, perhaps every five years as the USFS updates their FIA data. *(NFI-3)*

> **Response:** ARB staff participated in a webinar on October 14, 2014, where representatives from the FIA provided detailed information about the development of the Common Practice values, including the public location of all data used (http://www.fia.fs.fed.us/tools-data/), and explained how the data was used to calculate the Common Practice values provided to ARB by FIA. A copy of the presentation can be found on the ARB website at: http://www.arb.ca.gov/cc/capandtrade/meetings/101414/acr.webinar.us.forestry.slides.pdf.
>
> As explained in the webinar for the Common Practice update, the site class break was based on the data used to determine Common Practice values. Following the same procedures used to determine the original Common Practice values, the Common Practice data was broken into high (site class I-IV) and low (site class V-VII) based on the available data and for consistency across all assessment areas. The break for the Common Practice values must be mirrored in the high and low site class determination for the project. ARB staff intends to work with FIA and stakeholders to develop a timeframe and a process for future updates to the Common Practice values.

C-6.6. Comment: I would like to actually talk about one specific issue to give you an example of how this process has actually gone over the last year.

…As part of the September Board meeting, where the common practice numbers were presented, and the Board then directed staff to go back to stakeholders, ask them for their input so I quote there can be, "Sufficient time to review and comment on the common practice values".

The common practice values are numbers in an Excel sheet on a piece of paper. There is data behind those numbers that generate those numbers. In order to allow us time to sufficiently comment on these numbers, we have to review the work that goes into these numbers. This is a concept that was taught to me in second grade of show your work.

I can't review the numbers that are published without the work that goes into them. We've actually asked on several occasions that the methodology that has been to develop -- that was put in place to develop the existing common practice numbers and the updated common practice numbers be released to us to review. This has not been done.

All of this data is available, publicly from the FIA. That is the data that was used to develop the common practice numbers. We have not been able to replicate any of the common practice numbers based on that publicly available data. I'm asking that before you proceed with adopting this, you, at the very least, give us the opportunity to review the common practice methodology and release it.

So what I'm here to ask for at this time is that the methodology, the numbers that were used to create the existing common practice numbers, and the methodology, the calculations used to calculate the update to the common practice numbers both be released.

As of right now, both have been created in black boxes. Nothing has been presented to the public for our review. It has all been done behind the scenes, by a very few number of individuals, and not put out for public comment and review. *(FCC-4)*

> **Response:** ARB staff participated in a webinar on October 14, 2014, where representatives from the FIA provided detailed information about the development of the Common Practice values, including the public location of all data used (http://www.fia.fs.fed.us/tools-data/), and explained how the data was used to calculate the Common Practice values provided to ARB by FIA. A copy of the presentation can be found on the ARB website at: http://www.arb.ca.gov/cc/capandtrade/meetings/101414/acr.webinar.us.forestry.slides.pdf. Using this information the commenter should be able to recreate the Common Practice values.

C-7. Verification

C-7.1. Comment: Imposition of the new requirements would place offset verification bodies in the role of de facto forest practice inspectors, dramatically increasing time requirements for site visits and for offset verification services, in general. The additional time burden would likely be greatest during the first year after adoption of

the new requirements, as all parties involved in the marketplace would work to understand the meaning and intent of the new requirements. It is quite possible that the new requirement could likewise result in a substantive increase in the amount of ARB staff time necessitated to clarify the new requirements and review implementation of such. This may result in a compounding of an extant problem of insufficient ARB staff resources being committed to ARB's compliance offset program. *(SCS-3)*

> **Response:** ARB staff disagrees that the new verification requirements in the protocol will dramatically increase time required for verification. The primary new verification requirement results from the clarification to the even-aged management requirements found in subchapter 8.1, which now state clear and precise standards to verify against.
>
> As the commenter suggests, in the first year of a new protocol there may be additional time required to adjust to the new protocol requirements. ARB staff is committed to working with all participants to make the transition as smooth as possible. The adoption of a new or updated protocol will always take more ARB staff time to clarify new requirements. Staff has in place a policy for releasing and updating FAQs about all aspects of the offset program including the Forest Protocol. In addition, as directed by the Board at the hearing to adopt the Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing.

C-7.2. Comment: Section: 8.1(b)(2)(E)(2)(a): Language: Establish a 2-chain systematic grid within each harvest unit or buffer area sampled.

Comment: It is not clear how many harvest units or buffers need to be sampled. The level of auditing time and assessment rigor will obviously vary widely, depending on the number of areas sampled, and so it is recommended that this be clarified. (SCS-3)

> **Response:** The verifier must use professional judgment in applying the verification requirements in subchapter 8.1(b)(2)(E). Pursuant to section 95977.1(b)(3)(L) of the Regulation, verifiers are required to use professional judgment based on evaluation of a variety of risk factors when developing that sampling plan identifying what stands should be sampled. Verifiers are required to make a risk-based assessment for sampling stands that may be in question to determine if the project operator correctly classified the stands as stocked.

C-7.3. Comment: 8.1(b)(2)(E)(2)(c): Language: Navigate through the harvest unit or buffer area by selecting a course of successive sample points that initiate in the lowest stocked area and proceed to higher stocked points within the harvest unit;

Comment: It is unclear exactly what this language means. It is not clear what "lowest stocked" means. Even in the event that a definition is provided for this term, it will be impossible, in most cases, to precisely identify "the lowest stocked area". The instruction to "proceed to higher stocked points within the harvest unit" is meaningless as, by definition, all areas within a given polygon that are not "the lowest stocked area" of that polygon will be "higher stocked points". It is also unclear how this instruction is to be interpreted where a buffer area, rather than a harvest unit, is being inspected. *(SCS-3)*

> **Response:** This was removed in the 15-day version of the Forest Protocol; therefore, no response is necessary.

C-7.4. Comment: 8.1(b)(2)(E)(2)(d): Language: Sampling must be conducted for basal area retention and performed using a prism, relaskop, or angle gauge using a basal area factor that will yield 6-10 trees on average at each sample point throughout the harvest unit

Comment: The language "on average at each sample point" is self-contradictory. The quoted language makes sense only with "at each sample point" stricken. With this modification, it is good general forest sampling advice, but it becomes challenging when written into a regulatory protocol. It may be difficult to identify, ahead of time, the basal area factor that will yield 6-10 trees on average throughout the harvest unit. It does not make sense to require the verification body to achieve something that may not be practicable to achieve. *(SCS-3)*

> **Response:** This was removed in the 15-day version of the Forest Protocol; therefore, no response is necessary.

C-7.5. Comment: 8.1.1(c)(2): Language: When a carbon pool or combination of pools have been stratified into six or more strata for the purposes of estimating the forest project's inventory, the offset verifier must select a minimum of three strata, based on the offset verifier's evaluation of risk. The strata selected for sampling must represent a total sum of at least 50% of the total sum of carbon stocks measured in CO2e. Sampling of more than three strata may be required.

Comment: In practice, this language would mean that the lowest verification costs would always be ensured by selection of the three strata containing the highest total carbon stocks. As it is always important for verification bodies to keep verification costs competitive, verification bodies would therefore be under considerable pressure to consistently select the three strata containing the highest total carbon stocks. This would lead to the possibility that strata to be selected for sequential

sampling could be reliably determined beforehand, which may well lead to negative unintended consequences. As SCS feels that successful implementation of the sequential sampling procedure on up to three strata (as is done under the currently prevailing Protocol) is sufficient to attain a reasonable assurance regarding the quality of a forest inventory, it is recommended that these requirements be removed. *(SCS-3)*

> **Response:** ARB staff determined that due to the high number of strata in some projects, three strata did not accurately represent the project for verification. ARB staff added a requirement to sample enough strata to represent at least 50 percent of carbon stocks. The verifier must use professional judgment in selecting the appropriate strata based on risk of inaccurate measurement leading to an overstatement of carbon stocks.

C-7.6. Comment: 8.1.1(d): Language: Selection of stands must be based on the following

Comment: It is SCS' understanding that the procedures referring to "stands" within this section of the Protocol are optional and may be followed at the discretion of the verification body. However, this is not clear within the currently prevailing Protocol. It is suggested that this be clarified in the draft revision. (SCS-3)

> **Response:** The verifier must select stands for verification using the sequential sampling method; this is a protocol requirement, therefore it is not optional**.**

C-7.7. Comment: 8.1.1(e)(2): Language: Verification plots must reflect the variability in tree species, heights, and diameters existing in the project area

Comment: In practice, this text may conflict with the requirement of Section 8.1.1(e)(4) that "Plots, or clusters, must be independently selected within a stand using a random or systematic design" (since a statistically sound random or systematic design may not result in a set of plots that reflects "the variability in tree species, heights, and diameters existing in the project area". As the most important thing is to retain statistical validity in the selection of verification plots, it is recommended that this requirement be removed. *(SCS-3)*

> **Response:** Random plot design is not mutually exclusive with evaluation of variability. Verification is a risk-based process that already bases selection of stratum on stocking or risk. The variability in tree species, heights, and diameters existing in the project area simply identifies further criteria for verifiers to consider when selecting plots.

C-7.8. Comment: 8.1.1(e)(4): Language: If the offset project is not stratified for each applicable carbon pool, the offset verifier must allocate the plots or clusters on a randomized basis

Comment: It is unclear what this requirement means, or what it adds to the Protocol. It is suggested that this requirement be removed. *(SCS-3)*

> **Response:** The first part of subchapter 8.1.1(e)(4) is referring to stratified projects, therefore the requirement identified by the commenter clarifies that even in the absence of stratification, plots or clusters must be selected randomly.

C-7.9. Comment: 8.1.1(e)(5): Language: No more than 6 plots or clusters can be assigned to a stand, unless the groups of plots required for verification exceed the number of stands that exist for the offset project;

Comment: This language is confusing in its context within the draft revision. It should be moved in a manner that makes its linkage with Section 8.1.1(d) clearer. *(SCS-3)*

> **Response:** Both Subchapters 8.1.1(d) and (e) contain requirements for sequential sampling. Subchapter 8.1.1 (d) describes how stands are selected, and subchapter 8.1.1(e) describes how plots and clusters are selected from within the stand. Therefore, ARB staff believes that subchapter 8.1.1(e)(5) is the appropriate place for limits on the number of plots or clusters in a stand.

C-7.10. Comment: 8.1.1(e)(5): Language: The minimum number of sample plots varies by project size and number of strata (table 8.1).

Comment: It is recommended that the values in this table be reverted to those within the currently prevailing Protocol (see comment above about Section 8.1.1(c)(2)). *(SCS-3)*

> **Response:** Since ARB staff determined that additional strata needed to be sampled for project with a high number of strata (see response to comment 7.5 above), it was necessary to expand table 8.1 to provide sampling criteria for the additional strata.

C-7.11. Comment: 8.1.1(h): Language: For effective application of the sequential statistics in the field, the offset verifier must use their discretion to determine if the stopping rules have been met for each stratum….

Comment: It is unclear what this language means, exactly, or what clarity it is intended to add. In SCS' experience, the sequential sampling test is typically carried out after at least the minimum number of plots have been sampled and after a

number of additional plots have been sampled, as agreed to with the Offset Project Operator or Authorized Project Designee. Specific instructions on when to carry out the sequential sampling test are not contained within the currently prevailing Protocol, and SCS is aware of no reason why they should be. So far as all other requirements are complied with, it should be the verification body's determination as to when to undertake the sequential sampling test. It is recommended that sub-section 8.1.1(h) be deleted. (SCS-3)

> **Response:** Contrary to what the commenter indicates, the current version of the protocol contains requirements for evaluating the stopping rules after each plot or at the end of each day of sampling in subchapter 10.2.2. ARB staff determined that additional verifier discretion was appropriate and made modifications to this subchapter. One of the modifications made was to allow the determination after sampling additional plots, as determined to be necessary by the offset verifier and agreed upon with the OPO/APD, as the commenter identified as a typical evaluation point.

C-7.12. Comment: 8.1.1(h)(4): Language: The verifier may defer the determination until no later than the end of each day of sampling, which will include the full set of plots measured in that day.

Comment: It is unclear why any restrictions are being proposed regarding the timeline for carrying the sequential sampling process. In many cases, scheduling constraints preclude immediate implementation of the sequential sampling test (and a subsequent decision as to how to proceed). The requirement to carry out the decision at "the end of each day of sampling" would impose onerous, and costly restrictions where they are completely unnecessary. In some cases, it is not possible or recommended to complete a complex analysis after a long-day in the field. The priority should be for quality of quantification, not speed. *(SCS-3)*

> **Response:** The current version of the protocol contains requirements for evaluating the stopping rules after each plot or at the end of each day of sampling. These requirements are found in subchapter 10.2.2. These two points are the only times verifiers are allowed to evaluate stopping under the current protocol. ARB staff determined that additional verifier discretion was appropriate and made modifications to this subchapter. The modifications made allow two additional determination points: 1) after the minimum number of plots have been collected, and 2) after sampling additional plots, as determined to be necessary by the offset verifier and agreed upon with the OPO/APD. These modifications have the effect of not requiring stopping to be evaluated at the end of each day.

C-8. Other

C-8.1. Comment: Public Lands Definition (Chapter 1.2 Definitions): Under the current Forest Protocol, the definition of "public lands" is too broad. Avoided Conversion (AC) and IFM baseline requirements for public lands fail to take into account wide variation in management options open to independent agencies or authorities. They also establish baselines in a way that makes additional and environmentally valuable projects infeasible. To resolve this problem, IETA recommends that ARB restrict the definition of "public lands" so that independent agencies or authorities are categorized as private, given that these entities see similar budgetary pressures and management options as private owners. For any truly public agency, IFM baselines should be established based on common practice carbon stocks on other public forests in the assessment area based on FIA data (i.e. same approach taken for IFM projects). *(IETA-2)*

> **Response:** There is significant variability in how public agencies are required to manage their lands. Some "independent agencies" may have the ability to manage their properties similar to private entities, while others may have significant restrictions on how their lands are managed. ARB staff determined it was appropriate to maintain the current definition to ensure all GHG reductions or enhanced sequestration is additional to conservative business-as-usual. These "independent agencies" are still able to enter into projects, and ARB staff has modified the public lands baseline method to allow modeling, making projects easier to implement.

C-8.2. Comment: Forest Owner Definition (Former Section 2.2 Forest Owners): The current "Forest Owner" definition is ambiguous and leads to differing interpretations by ARB, Project Proponents, and verifiers. This will ultimately lead to inconsistency in its application. We recommend the Protocol definition of "Forest Owner" be modified to include only those entities that have an interest in the real property within the project area and have current control over the Project. *(IETA-2)*

> **Response:** The definition of Forest Owner remains unchanged from the Forest Protocol adopted by the Board in 2011. There are too many forest holders and carbon pools and sources involved in forest offset projects for ARB to make a determination of who is liable for activities that are undertaken on forest land. Such liability issues must be worked out between the parties through third-party contractual agreements. ARB must ensure the enforceability of the regulation, and ARB staff believes the current definition of Forest Owner with the regulatory enforcement provisions allows ARB to enforce against parties that are responsible for reversals and invalidations.

C-8.3. Comment: Eligibility Activities (Chapter 2): The current Forest Protocol does not contain a clear methodology for adjusting project boundaries after initial verification. Forest owners, particularly large owners, periodically have their property boundaries re-surveyed, which often leads to minor shifts in boundary locations and total acreage. We therefore recommend the Protocol allow for updates to project boundaries. *(IETA-2)*

> **Response:** ARB staff made modifications to several subchapters allowing operators to continue to use the original project baseline as long as an error greater than 5.00 percent did not occur. Therefore, for small changes in project boundaries that result from errors identified in the original boundary, the project operator would be required to identify the updated boundary in the Offset Project Data Report, but would not adjust the baseline if the error was less than 5.00 percent. The baseline cannot be adjusted for the purpose of removing a portion of the project.

C-8.4. Comment: Project Life & Minimum Time Requirement (Chapter 3.5.1): Under the updated Forest Protocol, a new owner of any part of the forestry project must agree to take over the project responsibilities and commitments. This approach unreasonably and unfairly restricts the ability of a landowner to sell any or all of the land in a project for a least 100 years, thereby limiting the number of projects that participate in California's program. We recommend that Forest Owners be allowed to sell, or otherwise transfer, a portion of the Project Area from the Project, without obligating the new owner to the 100 year commitment (or what remains of it) provided that the OPO or APD undertakes an additional verification prior to the sale. *(IETA-2)*

> **Response:** Both the definition of Forest Owner and the 100-year permanence requirement remain unchanged from the Forest Protocol adopted by the Board in 2011. There are too many forest holders and carbon pools and sources involved in forest offset projects for ARB to make a determination of who is liable for activities that are undertaken on forest land. Such liability issues must be worked out between the parties through third-party contractual agreements. ARB must ensure the enforceability of the regulation, and ARB staff believes the current definition of Forest Owner with the regulatory enforcement provisions allows ARB to enforce against parties that are responsible for reversals and invalidations.
>
> ARB staff disagrees with comments suggesting that parts of projects should be able to be removed from the project as long as all carbon is accurately accounted for. Forest Owners voluntarily commit to a forest project with full knowledge of the 100-year time commitment and are expected to meet all project commitments. Maintaining the same project acreage for the lifetime of the project is essential to maintaining permanence of issued offsets. To

remove a project area, would require a substantial effort on behalf of the project operators, verifiers, OPR staff, and ARB staff and risk errors resulting in ARB offsets not being permanent. Since all project participants voluntarily committed to the 100-year time commitment, ARB staff has determined that the risk is too great to allow removal of project area after beginning a crediting period. The project baseline is set at project commencement incorporating the entire project acreage, and cannot be changed or subdivided unless an error has been identified. In the case of an error, the project operator will note the change in the project area in the OPDR. The baseline will only have to be modified if the error is greater than 5.00 percent. If a material misstatement greater than 5.00 percent is determined then excess issued ARB offset credits will be subject to invalidation.

Ensuring permanence is essential to the environmental integrity of the entire Cap-and-Trade Program. Because offsets allow for an equivalent quantity of GHG emissions within the capped sectors, the CO_2 stored in biological sinks resulting from offset project activities must stay out of the atmosphere for a time period comparable to the emissions they are offsetting. If they do not, the net effect would be an increase in GHG emissions to the atmosphere. Scientific estimates of the atmospheric lifetime of anthropogenic CO_2 emissions are uncertain, as CO_2 is removed from the atmosphere by a number of processes that operate at different timescales. However, 100 years should be viewed as a minimum time period for maintaining permanence because a fraction of anthropogenic CO_2 is expected to remain in the atmosphere well beyond 100 years as it is gradually removed through processes such as silicate weathering. The period of 100 years is frequently used in international climate change policy as a standard frame of reference for determining global warming potentials and setting GHG emission reduction targets, and consequently, the use of 100 years to define the permanence of GHG reductions is consistent with international policy.

C-8.5. Comment: Regulatory Compliance & Project Activity (Chapter 3.8): Under the Forest Protocol, compliance with legal provisions depend on ambiguous, inconsistent and overly broad definitions of offset project activities and violations as they potentially apply to activities that are unrelated to the Forest Project. The ambiguity of regulatory and protocol compliance language makes it extremely difficult for market participants to establish the probability and magnitude of risks related to compliance with legal requirements. If offsets – forestry and beyond – are to continue to play an important cost containment role in California's cap and trade program, it is critical that more specific language and clear boundaries on regulatory compliance and offset project activities be provided. *(IETA-2)*

Response: Comments related to offset invalidation and regulatory compliance are outside the scope of this rulemaking process. However, ARB posted a guidance document in February 2015 entitled "California Air Resources Board Offset Credit Regulatory Conformance and Invalidation Guidance" to provide further clarity on regulatory conformance requirements and the scope of activities that are subject to review for each specific project type. ARB staff will continue to discuss these concerns with stakeholders that remain unsure of what constitutes regulatory conformance and which activities and violations may subject the project to the invalidation provisions of the Regulation.

The document is available here: http://www.arb.ca.gov/cc/capandtrade/offsets/arboc_guide_regul_conform_invalidation.pdf

If project developers or other interested parties have questions related to a specific project, they should contact ARB staff.

C-8.6. Comment: Reporting Period (Chapter 3.8 Regulatory Compliance): The protocol states that credits from an entire reporting period are not eligible for issuance, if the offset project was out of compliance during the reporting period. For many offset project types with typical reporting periods spanning long time horizons, it is inappropriate to penalize an entire reporting period for a violation that may have been incurred and rectified within a matter of days. We therefore ask ARB to provide clarification specifying that only credits arising during the period of an actual violation could potentially be subject to invalidation rather than all credits arising during the entire Reporting Period. *(IETA-2)*

Response: Comments related to offset invalidation and regulatory compliance are outside the scope of this rulemaking process. However, ARB posted a guidance document in February 2015 entitled "California Air Resources Board Offset Credit Regulatory Conformance and Invalidation Guidance" to provide further clarity on regulatory conformance requirements and the scope of activities that are subject to review for each specific project type. ARB staff will continue to discuss these concerns with stakeholders that remain unsure of what constitutes regulatory conformance and which activities and violations may subject the project to the invalidation provisions of the Regulation.

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If project developers or other interested parties have questions related to a specific project, they should contact ARB staff.

C-8.7. Comment: Section 5.2.1 Estimating Baseline Onsite Carbon Stocks – Private Land. Section (h)(1) states "If a subsequent verification(s) detects correctable errors of greater than 5.00 percent to the baseline or to quantified GHG reductions or GHG removal enhancements, the baseline must be adjusted prior to a verification statement being issued. The corrected baseline would then supersede the originally verified baseline for the purpose of determining GHG emission reductions and GHG removal enhancements going forward."

As written above, the new statement causes confusion on how to calculate QRy (Equation 5.1). If a verifier is conducting a data check of Equation 5.1, then Δ BConsite and BCwp,y are ambiguous. It is unclear if a corrected, or the original baseline value, should be inserted. *(ESI-2)*

Response: The corrected values should be used in all situations where baseline values have been corrected.

C-8.8. Comment: Please revise section headings for the final protocol to improve readability and navigation. The current format of the draft 2015 Protocol is similar to the Regulation and makes desk review activities associated with verification more cumbersome, as all current templates, checklists, and internal documents will need to be revised. This will be an extremely costly expense to the verification bodies.

Further, the current format is not reader-friendly. For example, it is difficult to navigate the subsections and also to know to what the over-arching section is referring. The previously adopted Protocol versions allowed the reader to quickly identify if the rule referred to for each project type (IFM, Reforestation, or Avoided Conversion projects).

Please implement a format similar to the previous adopted versions of the Protocol, with each section and subsection fully numbered and available in the Table of Contents. *(ESI-2)*

Response: ARB staff determined changes are not necessary. The protocol is a regulation document; therefore, one of ARB staff's primary objectives for the current proposed revisions to the protocol was to rewrite the protocol in a more regulatory format. Much of the language in the original protocol is explanatory in nature, and more appropriate for the Initial Statement of Reasons than a regulation document. The current proposed version of the protocol was streamlined to only include explicit project and verification requirements. Additionally, the regulatory format makes references to particular requirements simpler than the multiple-paragraph sections, without further identifying breaks, found in the current version of the protocol. The

protocol does contain a table of contents identifying every chapter and subchapter.

ARB staff understands that there may be expense involved in updating to any new protocol, regardless of the format. ARB staff hopes the additional clarity and streamlined format of the new Forest Protocol will balance some of these expenses.

C-8.9. Comment: Section 5.2.1(b) States "(1) Identifying the total metric tons of CO2e contained in the initial above-ground standing live tree carbon stocks within the project area; and (2) Dividing this amount by the number of acres in the project area." Forest sampling provides results on a per-acre basis, which is then multiplied by the acreage to determine the total. Please revise this section for consistency with professional forestry practices. *(ESI-2)*

Response: Not all projects have the above-ground standing live tree carbon stocks as a per-acre value, so this section is necessary. Any project that starts with above-ground standing live carbon stocks as a per-acre value does not have to complete this step.

C-8.10. Comment: Section 5.2.1(e)(2)(B) This Section states "Providing evidence that activities similar to the proposed baseline growth and harvesting regime have taken place within the past 15 years on at least three other properties within the forest project's assessment area. At least one comparable site must be on land not owned by the forest owner(s) and/or its affiliates, and no more than one comparable site may be within the project area. Comparable sites on land owned by the forest owner(s) and/or its affiliates must not have had harvest activities within two years before the offset project commencement date."

Again, Assessment Areas are not spatially explicit, but rather they are based on forest ecosystems or communities (groups of species). As such, it is unclear how an OPO can determine what percentage of a given Assessment Area they own. Similar to the above suggestion regarding the LMU definition, ESI suggests modifying the proposed updated requirements in Section 5.2.1(e)(2) to apply to "Supersections" vs. Assessment Areas, as these are spatially explicit and efficiently verifiable. *(ESI-2)*

Response: ARB staff believes the commenter is referring to the 50% ownership requirement that was removed in the 15-day modifications to the protocol. Therefore, no response is required.

C-8.11. Comment: Table 3.1 – Native Species and Composition of Native Species – Reforestation Projects. This table states "Reforestation projects as qualified in subchapter 5.1.1(b)(2) may defer assessment until the submission of the Offset Project Data Report that will undergo the second site-visit verification."

Subsequently the table states "Project is not eligible unless it is demonstrated that management activities will enable this goal to be achieved within 25 reporting periods."

These two statements are somewhat contradictory, as the OPO may try to defer assessment of criteria to second site visit verification and not address the demonstration at all in the first verification. ESI suggests the eligibility criteria under "Timeline for Meeting Criteria" is also adjusted to allow for projects to defer the demonstration until the second site visit verification. *(ESI-2)*

> **Response:** Since reforestation projects are allowed to defer the assessment of native species until the second site-visit verification, they also are able to defer the demonstration until the second site visit verification. Without the assessment, the verifier is unable to make a determination of progress toward the native species requirement. Therefore, no change is necessary to address this comment.

C-8.12. Comment: 8.1.1. Sequential Sampling Section 8.1.1(a) states, "The offset verifier must re-measure existing monumented sample plots when all plot locations within a project area can be found and it is statistically appropriate. If more than 10.00% any portion of a project area's sample plots cannot be relocated or measurement of project sample plots is not statistically appropriate, the verifier must install sample plots independent of the project's sample plots. If a monumented sample plot within the allowable 10.00% cannot be located, the verifier must move to the next sequential randomly selected plot. The verification approach will determine whether a paired or unpaired test will be used by the verifier."

In the second sentence of the above paragraph, the term relocated is ambiguous. Based on previous guidance from ARB, it is ESI understands that this term is referring to the reestablishment of plot center using unbiased methods, for example through the use of azimuths and distances from witness trees.

Please revise this section for additional clarity regarding the term "relocated." Further, should a 10% threshold be exceeded, can paired plots measured by the verifier up to the 10% threshold be utilized in the calculation of the unpaired test; or are these plots required to be discarded and a newly determined unpaired analysis begins? Please clarify in the adopted Protocol. *(ESI-2)*

> **Response:** As the commenter correctly suggests, "relocated" means reestablishment of the plot center or identifying the pre-established plot. If the more than 10.00 percent of paired plots cannot be located, then the already measured plots can be used as part of the unpaired analysis.

C-8.13. Multiple Comments: Inconsistencies in the required carbon dioxide equivalents conversion factor: Both equations C.8 and C.17 in Appendix C call for

use of the carbon dioxide equivalents conversion factor of 3.664. All other sections of the modified Protocol (proposed 20 May 2015) require the use of a factor 3.667. Please revise the noted equations to ensure consistency in the carbon dioxide equivalents conversion factors required by the Protocol. *(ESI-2)*

Comment: Carbon Conversion Factor - Appendix A (f) (3). The conversion factor of 3.667 was switched to 3.664 in the November 2014 protocol. Why is ARB proposing to revert to 3.667? *(FCC-3)*

Comment: ***10. CO2 conversion factors should be consistent throughout the Protocol.*** ARB has done a good job of standardizing the conversion factors from carbon to carbon dioxide; however, in two places the conversion factor is still not consistent: on page 127 and on page 134 where it is stated as 3.664. *(NFI-3)*

> **Response:** To maintain consistency between all offset protocols, ARB staff has selected 3.667 as the appropriate carbon-to-carbon dioxide conversion factor and has switched all values to 3.667. The value of 3.667 represents the molecular weight ratio of carbon dioxide (44) to carbon (12). The 3.664 value has been modified to 3.667 in equation C.8 and C.17 as non-substantive changes.

C-8.14. Comment: On the basis of the experience outlined above, SCS has substantive concerns regarding the new requirements, and the corresponding implications for verification against said requirements, as set out in Sections 3.1(a)(4) and Section 8.1(b)(2)(E)-(F) of the Forest Offset Protocol update. It is SCS' recommendation that the content of these sections, and all corresponding definitions, be removed from the proposed changes. These requirements are not present in the current version of the Forest Offset Protocol (dated November 14, 2014) and they would impose significant constraints that would serve to: (a) limit the applicability of the Forest Offset Protocol, (b) introduce the potential for ambiguity in the Forest Offset Protocol that cannot be easily rectified and (c) lead to a significant increase in costs related to offset verification services. It is fundamentally unclear to SCS that the benefits that might be realized from imposition of these new requirements would outweigh the significant increase in verification costs and the concomitant reduction in the number of compliance-grade forest carbon offset projects that are developed. *(SCS-3)*

> **Response:** The commenter is referring to the modified even-aged management standards. The commenter's other comments on even-aged management and other aspects of the protocol are addressed elsewhere in this document. The even-aged management provisions of the Forest Protocol have been harmonized with the California Forest Practice Rules, as directed by the Board at the December 2014 Board hearing. The harmonization of the even-aged standards adds significant clarification to the

protocol. The November 14, 2014, version of the protocol cited by the commenter has residual stocking and buffer area requirements without clearly defined and measurable standards. The harmonization with the California Forest Practice Rules provides measurable standards and defined verification procedures. Therefore, the benefits outweigh any anticipated additional cost.

As also directed by the Board at the hearing to adopt the Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing. Any further guidance on the even-aged management subchapter will be based on the California Forest Practice Rules. As part of this process, any necessary clarifications, including how to determine healthy trees or two growing seasons, will be included.

C-8.15. Comment: Section 3.1(a)(2)(C)3 sustainable long-term harvesting practices (Page 20) has been discussed in project verifications as having a retrospective analysis of harvests that occurred prior to the project commencement date. The Reserve believes this section was intended to be forward- thinking and applied to all harvests as of the project commencement date, as indicated in Section 3.1(a) (2): When a harvest plan is submitted to a state or federal agency or when commercial harvesting is initiated, the Offset Project Operator or Authorized Project Designee must demonstrate that sustainable harvesting practices are employed on all forest landholdings within the geographic areas eligible under this protocol.

While perhaps superfluous, the Reserve recommends adding to the language; "As of the project commencement date, the forest owner(s) must employ uneven-aged silvicultural practices (if harvesting occurs)……..."

This will ensure this section is not mistakenly characterized and consistent with the thinking in Section 3.1(a)(4)(E) that limits examination of harvest practices to those which have occurred subsequent to the commencement date. *(SIGLLC-2)*

Response: ARB staff agrees that the addition would be superfluous. The verb "are" in subchapter 3.1(a)(2), "…must demonstrate that sustainable harvesting practices <u>are</u> employed…" clearly indicated that the standards only apply to the reporting period in question. If ARB staff meant the standards to apply to past periods, the language would have read: "must demonstrate that sustainable harvesting practices <u>have been</u> employed." Therefore, no change is necessary to address this comment.

C-8.16. Comment: Section 5.2.1(e)(2)(B)3 Demonstration of Financial Feasibility, page 64, The clarification of how OPOs demonstrate financial feasibility is an improvement. However, we believe the intent of the language is

more clear with the following minor edits (in bold and underlined):

Comparable species composition to the project area which may be evidenced by **one of** the following:

(i.e., Comparable property species composition is within 20 percent of project species composition based on trees per acre); **or**

Identical codominant species; or

Identical Forest Type as defined by the USDA Forest Inventory and Analysis Database Description and User Guide for Phase 2 (V6.0.1), Appendix D. *(SIGLLC-2)*

> **Response:** It is standard regulatory practice to only include the "or" before the last item in the list. The presence of the final "or" indicates that only one of the three identified methods needs to be met.

C-8.17. Comment: Appendix B, Quantification Guidance, (j) Page 124, states The following sentence; "Projected baseline and actual carbon stocks must be portrayed in a graph depicting time (starting from offset project commencement) in the x-axis and carbon tons in the y-axis" appears to include a requirement to provide a projection of the 'actual' carbon tons as part of the initial verification The reference to actual carbon stocks should be removed as it is impossible to accurately project, and be held accountable for, project carbon stocks that will be present over the next 100+ years. What is critical for the offset calculation is that an accurate accounting occurs between the actual project carbon tons present and the project's baseline at the end of each monitoring period. *(SIGLLC-2)*

> **Response:** This requirement is unchanged from the original version of the Forest Protocol adopted by the Board in 2011. This is only required as part of the modeling plan, and is an important part of the project's demonstration that actual carbon stocks will increase over the baseline during the crediting period. Without proper consideration of future stocking, the project operator cannot know if the project is financially viable over the project lifetime. ARB staff understands this is only an initial projection and may change as the project develops.

C-8.18. Comment: Less-intensive Verification Rotation Requirements - Chapter 8 (e) & (f). If all verification bodies hold the same accreditation by ARB and have received the same training, it is unnecessary to require that a less intense verification be conducted only by the verification body that did the last full verification. We assert that any verification body should be able to conduct less intense verifications, regardless if they did the full verification, so long as they are ARB accredited. *(FCC-3)*

Response: This requirement is unchanged from the original version of the Forest Protocol adopted by the Board in 2011. Only the verification body that conducted the last full verification (including site visit) may conduct the less intensive verification because the verification is based on analysis and risk assessment from the most current sampling plan developed as part of the most recent full offset verification services including observations from the site visit. Without a site visit, the sampling plan cannot sufficiently evaluate risk.

C-8.19. Comment: Stand Table Projection Method. In the November 2014 protocol, this particular language and guidance refers to using a stand table projection method. The proposed language reads as though it could be applied to one of the approved growth and yield models.

We assert that language should be added back in to clarify that Appendix B (e) refers to stand table projection methods and not to the approved growth and yield models. *(FCC-3)*

Response: Requirements (1)-(3) of Appendix B(e) describe a stand table projection method, so it is not necessary to explicitly identify them as a stand table projection method in Appendix B(e).

C-8.20. Comment:

The new procedure does not include how many harvests need to be examined in order to confirm that harvest size and buffer requirements have been met across the project. This will force verifiers to examine a potentially excessive number of harvested stands to feel comfortable that they are meeting ARB standards. This will increase both the cost and time required for site verifications.

The new procedure requires that "Countable Trees," defined as "trees that must be in place at least two growing seasons and must be live and healthy." (page 4) be measured, but no definition of "healthy" is provided. This will lead to verification problems when determining which trees are acceptable to be counted.

The new procedure mandates, “Even-aged harvest units shall be separated by an area that is at least as large as the area being harvested or 20 acres, whichever is less…” (page 21) but it is not clear how this area of separation between harvests is to be calculated. Linear distance between harvest boundaries is logical and verifiable, but an area metric is inappropriate here.

The new procedure is unclear on how to assess the basal area requirement during full verifications. The procedures outlined in the protocol are for assessing the 150 point count/acre requirement, but there is no guidance on how to assess the 50 BA requirement. This could lead to verifier’s conducting work that will later be judged by

ARB as unacceptable, thereby requiring additional field work, expense, and ARB staff time. *(RCE-2)*

Response: The protocol's verification requirements contains prescriptive standards (subchapter 8.1(b)(2)(E)) that the verifiers must apply, using professional judgment, to determine if stocking levels that come from the California Forest Practice Rules have been met. Pursuant to section 95977.1(b)(3)(L) of the Regulation, verifiers are required to use professional judgment based on evaluation of a variety of risk factors when developing that sampling plan identifying what stands should be sampled.

For determining the separation between even-aged harvests, subchapter 3.1(a)(4)(B) of the Forest Protocol contains a both an area and linear metric that are applied together. The buffer "shall be separated by at least 300 ft. in all directions" and the total area of the buffer around an even-aged managed must sum to the acreage requirement. The verifier will have to make two determinations: 1) is there at least 300 linear feet in all directions from the even-aged harvest, and 2) does the total area around the harvest meet or exceed the acreage requirements of the protocol. The linear requirement alone is not sufficient because alone it would not assure an adequate buffer under all conditions.

As directed by the Board at the June 25, 2015, hearing to adopt the updated Forest Protocol, ARB staff is conducting a series of workshops/webinars to allow for stakeholder input into the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalization by ARB. Any further guidance on the even-aged management requirements will be based on the California Forest Practice Rules. As part of this process, any necessary clarifications, including how to determine healthy trees, will be included.

Basal area is a common forestry term indicating the cross-sectional area of a tree based on the diameter at breast height. As stated above, at Board direction, ARB staff will be developing implementation guidance with the input of stakeholders which will include any clarifications where helpful.

C-8.21. Comment: While these two examples are only some of the complex technical issues resulting from the proposed new rules, they fail to meet the Boards clear statement that ARB was not trying to re-write or set new standards than those that California landowners already meet. *(SPI-3)*

Response: The commenter is referring to the even-aged standards in the Forest Protocol. ARB staff disagrees with the commenter's assertion that the current even-aged management requirements would re-write the California

Forest Practice Rules or set new standards. The even-aged management provisions were harmonized to the California Forest Practice Rules as directed by the Board at the December 2014 Board hearing, and were reviewed by the California Board of Forestry and the Department of Forestry and Fire Protection for conformance with the California Forest Practice Rules. Neither agency identified any concerns, and ARB staff is unable to determine how the even-aged management requirements in the Forest Protocol could be perceived as more stringent than those that California landowners already meet.

C-8.22. Comment: Section: 1.2(38)

Language: "Professional Forester" means a professional engaged in the science and profession of forestry. For forest projects that occur in a jurisdiction that has professional forester licensing laws and regulations, a professional forester must be credentialed in that jurisdiction. Where a jurisdiction does not have a professional forester law or regulation, then a professional forester is defined as either having the Certified Forester credentials managed by the Society of American Foresters, or other valid professional forester license or credential approved by a government agency in a different jurisdiction.

For forest projects that occur on lands held in trust by the United States for a tribe or a tribal member, or on tribally owned fee land, a Professional Forester with credentials managed by the Society of American Foresters, Tribal Forest Manager, Tribal Timber Sale Officer, Tribal or BIA Officer in Charge, or BIA Regional Forester is sufficient.

Comment: The professional forestry credentials from a jurisdiction (e.g. a CA Registered Professional Forester) should also be suitable for tribal lands since a SAF CF (Society of American Foresters Certified Forester) is allowed.

In addition, jurisdictions that have a professional forester licensing law but it is not a requirement to practice forestry the professional forester credential should not be required. For example, in the state of Michigan, you do not need to be a "registered forester" to practice forestry; it is a voluntary registration.

It would be helpful for ARB to provide a list of the states which have a professional forester law or regulations so both OPOs and Verification Bodies are aware of the requirements. *(SCS-3)*

Response: ARB staff selected the requirement of a licensed Professional Forester to ensure that a qualified individual with a documented level of forestry experience evaluates all projects; therefore, a certification is necessary, even in states where it is not required, to demonstrate competence. ARB staff worked with tribes in identifying suitable qualifications

for foresters on projects located on tribal lands and considered their recommendations in the development of the protocol. Tribes are sovereign and it is up to the tribe to recognize licensing laws from other jurisdictions. The additional eligible foresters listed for tribal lands are available in case the tribe does not have its own, or recognize other jurisdiction's, licensing laws.

C-8.23. Comment: Section: 8.1(b)(2) (E)(2)

Language: Verifiers must use professional judgment as determined by the Registered Professional Forester when assessing the basal area retention levels, size limitations, and buffer area requirements and may make determinations by visual inspection, if obvious, or sampling according to the following basal retention sampling guidance

Comment: "Registered Professional Forester" is not defined. Perhaps this was meant as a reference to "Professional Forester"? It is suggested that criteria for determination of when determinations can be made "by visual inspection". Verification bodies are likely to experience a high level of pressure to forego the time-intensive field sampling procedure set out in Section 8.1(b)(2)(E)(2), and, therefore, a high level of pressure to make determinations by visual inspection. Additional criteria would assist in ensuring that verification bodies provide the level of rigor in assessing these requirements that is required by ARB. *(SCS-3)*

Response: This subchapter was removed in the 15-day version of the protocol; therefore, no response is required.

C-8.24. Comment: With respect to ARB's proposed changes to the Compliance Offset Protocol for U.S. Forest Projects we are concerned first and foremost that a technically incorrect baseline will further diminish the supply of offsets obtained from qualifying forestry projects. Economic forecasts from reputable sources such as Finite Carbon, Bloomberg New Energy Finance and forest project developers indicate a 40-60% reduction in offset supply through 2020 resulting from ARB's proposed new Common Practice (CP) values and eligibility requirements for private Improved Forest Management (IFM) projects. *(WSPA-1)*

Response: Following the requirements of the protocol ensures that a technically sound baseline is established.

The commenter is inferring the new Common Practice values are incorrect. ARB staff disagrees that the new Common Practice values do not accurately reflect true stocking from common practice forest management. The data obtained from the FIA accurately reflects business-as-usual practice on forest land throughout the U.S. in recent years based on physical inventories of plots throughout the U.S., and therefore, reflects true common practice.

Resolution 11-32 directs ARB staff to periodically review and update compliance offset protocols. The proposed Common Practice values represent the most recent carbon stock data from FIA. The data was collected using the most recent scientific methods and is more comprehensive than the data set used to establish the existing Common Practice values. This is the first time ARB staff is proposing to change the Common Practice values from the original protocol first considered by the Board in December 2010.

The commenter states the data set used to calculate the proposed Common Practice values is unrepresentative of long-term forest timber demands because it includes the period of time spanning the recession, when single home family starts dropped dramatically and there was a low demand for forest timber. The existing Common Practice values span the general timeframe of 2001 to 2006. This includes the years of 2004 and 2005, which were an unprecedented period of high single-family housing starts and forest timber demand.

Domestic timber demand is generally on the decline. The transition to electronic from paper media, increased imports of furniture, and decreased demand for paperboard products all represent long-term structural changes in the wood sector economy. Furthermore, a review of historical single-family home starts for 2007-2012, the same time period as covered by the proposed Common Practice values, shows that single-family home starts for this time period are similar to long-term average single-family home starts over longer time periods spanning back to 1960. The FIA updates its forest inventory on a rolling basis of 5, 7, or 10 years, so that majority of data for the Common Practice values comes from the 2007-2012 timeframe. This suggests the proposed Common Practice values are more representative of long-term trends in timber demand and the current Common Practice values are representative of an anomalous period of high and unsustainable growth in the home construction sector.

The commenter is also concerned the proposed changes to the Forestry Protocol will result in reduced offset supply. While offset supply is an important factor, assuring that all ARB offsets represent real, permanent, quantifiable, verifiable, enforceable, and additional GHG emission reductions and GHG removal enhancements is also important. ARB has taken several steps to address offset supply concerns. In addition to the four originally approved protocols in 2011, ARB has added a Mine Methane Capture offset Project Protocol, is proposing to add a Rice Cultivation Projects Protocol, and extend the geographic scope of the current Forestry Protocol to include Alaska. ARB staff will continue to evaluate and propose new offset protocols

that will generate compliance offset credits that meet AB 32 criteria. It is also important to note that there is no indication that all possible projects have been implemented under the existing protocols. Offset projects are price-responsive. If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, ARB expects that project developers will respond by undertaking more projects with the expectation of higher returns on investment.

C-8.25. Comment: ***4. "Boots on the ground inventory" should be retained in modified form as a means of demonstrating project commencement date, or the minimum reporting period should be reduced to one month.*** Previously, ARB accepted 'boots on the ground inventory' as a means of demonstrating a project's commencement date. The proposed protocol would only accept listing, change of ownership or easement recordation as evidence of project commencement. In practice, project listing will become the most frequent evidence of a project's commencement.

The data now required by ARB for listing is fairly detailed, and so much of a project can already be complete at the time of project listing. The Cap and Trade Regulation requires a minimum six month reporting period. The combination of project commencement at listing and a minimum six-month reporting period will unnecessarily delay project enrollment: many projects would be able to verify existing carbon stocks soon after listing but will be forced to wait for the minimum six month reporting period. This delay will adversely affect the timing of offset supply.

We recognize that 'boots on the ground inventory' as project commencement may be difficult to adequately verify in some instances. However, we suggest the remedy is to simply tighten the criteria to ensure that such inventory was actually installed for the purpose of initiating a carbon project under the protocol.

We recommend that ARB either (a) accept "boots on the ground inventory" as a project commencement date IF the offset project operator or Authorized Project Designee can demonstrate through a contemporaneous written instrument that the inventory was specifically being implemented for the purposes of the ARB compliance offset protocol; or (b) allow a minimum reporting period of one month for forest projects. *(NFI-3)*

Response: ARB has allowed "boots on the ground," or commencement of a carbon inventory, for the project commencement date because the language in both the early action offset protocols and the Forest Protocol adopted by the Board in 2011 did not explicitly limit project commencement to the three identified activities. As New Forest stated in their comment, it is difficult to adequately verify "boots on the ground" as project commencement; therefore, ARB staff intentionally limited the project commencement date to

the three previously eligible, and easily verifiable activities, effectively removing "boots on the ground" from the protocol as an eligible project commencement date.

The minimum six month reporting period is found in section 95802 (a)(332) of the Regulation and is outside the scope of this rulemaking.

C-8.26. Comment: ***5. Disclosure requirements in the Protocol should not exceed disclosure requirements in the Cap and Trade Regulation.*** Section 3.8 in the proposed Protocol states that projects must meet the regulatory compliance requirements set forth in Section 95973(b) of the Cap and Trade Regulation. In the very next clause, the Protocol states that the OPO or APD "is required to disclose in writing to the verifier any and all instances of non-compliance with any legal requirement associated with the project lands." 95973(b) is expressly limited to local, regional and national requirements for environmental impact assessments and all local, regional, and national "environmental and health and safety laws and regulations that apply based on the offset project location and that directly apply to the offset project". Asking for a broader scope of information in the Protocol that is non-actionable under the express terms of the Cap and Trade Regulation places the Protocol in conflict with the Regulation. As drafted, it could be read that OPOs, APDs, verifiers and offset purchasers are now required to diligence for securities laws violations related to the project lands, incidents of trespass by third parties, right of way disputes with neighbors, contractual disputes with a lessee hunting club, or similar legal matters not directly associated with the offset project area or activity. The proposed language would impose significant additional costs on all participants in the system for information that cannot actually be used by ARB because Section 95973 limits the scope of required regulatory compliance for offset issuance to applicable environmental, health and safety laws.

Similarly, the proposed Section 7.2.1(a)(8) would require for annual reporting a "Statement as to whether the forest project and associated project lands have met and been in compliance with all local, state, or federal regulatory requirements during the reporting period. If not, an explanation of the non- compliance must be provided". This requirement is broader than the regulatory compliance required under the Protocol, which again is limited to environmental, health or safety laws that apply to the project.

We recommend amending Section 3.8 and 7.2.1(a)(8) to only refer to environmental and health and safety laws and regulations that apply based on the offset project location and that directly apply to the offset project. *(NFI-3)*

Response: The disclosure requirements of the Forest Protocol do not exceed the requirements of the Regulation. The requirement to disclose in writing to the verifier any and all instances of non-compliance with any legal

requirement associated with the project lands is unchanged from the Forest Protocol originally adopted by the Board in 2011. Section 95973(b) of the Regulation, which is outside the scope of this rulemaking, is not limited to environmental and health and safety laws. Section 95973(b) states "…The project is out of regulatory compliance if the project is subject to enforcement action by a regulatory oversight body during the Reporting Period…" This is also consistent with the requirements of subchapter 3.7 in the 2011 Forest Protocol, which states "…Offset projects must also meet any other local, regional, and national requirements that apply."

C-8.27. Comment: ***6. The Protocol should only require the name and contact information of the OPO, other forest owners and the APD, if applicable.*** Section 7.1.1(a)(8) requires the listing of the name and contact information for all forest owners, "as well as third parties with existing property interests within the project area that may have an effect on the trees and standing timber located in the project area (e.g., mineral rights, timber rights, easements, rights of way, leases, etc.)". Section 7.1.1(a)(9) further requires the "name and mailing address of other parties with a material interest in the real property involved in the forest project." In some cases, the identification of third parties with property interests may be simple; in others impossible or prohibitively expensive, such as when mineral rights have been severed from the fee interest and subsequently transacted without recordation of the transaction in county records (a frequent occurrence). Either way ARB has a remedy for breach of the protocol against the OPO and forest owners, but (particularly in other states) not necessarily against third-party property right holders who did not sign attestations submitting to personal jurisdiction in the state courts of California. The Protocol wisely does not require such third party property right holders to sign the attestations with the OPO, as it would prevent the enrollment of most projects – there would be no way to get many minor easement holders to accept liability for a project that they do not control and does not benefit from. The OPO accepts liability even if third parties (such as a mineral rights holder) adversely affect the carbon stocks. This is an appropriate allocation of risk.

Section 7.1.1(a)(9) would seem to encompass all individuals with a financial or security interest in the real property covered by a forest project, which in the case of publicly listed companies could run into the hundreds of thousands of shareholders. It also leaves open the question of what is a 'material' interest as opposed to 'immaterial'. The provision also could be read to apply to third-party easement holders, in which case the OPO could be required to disclose information that is not legally available to the OPO, such as the financial interests in a third-party privately held company that holds a right-of-way across the project area.

The information required in sections 7.1.1(a)(8) and (9) seems to require information that is not necessarily actionable by ARB (what use is knowing each and every utility

easement or right of way easement holder?) but imposes significant costs on participants. In addition, both sections are drafted with significant ambiguities that would make it difficult to assess how to comply.

We recommend amending 7.1.1(a)(8) to: (a) include holders of 'timber rights' in the category of 'forest owner' rather than in the category of 'third parties with existing property interests'; (b) require name and mailing address only for forest owners, not third parties with existing property interests; (c) require only names but not mailing addresses for third parties with existing property interests; and (d) when mineral rights have been severed from the fee, require only the name of the mineral rights holder as a matter of county record. *(NFI-3)*

> **Response:** These requirements are unchanged from the original Forest Protocol adopted by the Board in 2011. There are too many entities with material and property interest and carbon pools and sources involved in forest offset projects for ARB to make a determination of who is liable for activities that are undertaken on forest land. Such liability issues must be worked out between the parties through third-party contractual agreements. ARB must ensure the enforceability of the regulation, and ARB staff believes the current requirements for reporting entities with material and property interest along with the regulatory enforcement provisions allow ARB to enforce against parties that are responsible for reversals and invalidations.

C-8.28. Comment: ***7. Suggested edits to the sequential sampling section; recommendations for improvement.*** The following comments highlight issue in Section 8.1.1, itemized by 8.1.1 subsection:

(a) The evaluation of needing to use an unpaired test should be clarified to be on a stratum basis where appropriate.

(d) The selection of stands is applicable to unpaired tests.

(e) The selection of plots is applicable to paired tests.

(e)(2) Verification plots must reflect the variability in tree species, heights and diameters existing in a project area. This implies a multi-stage sampling design rather than a random plot design, which is an unnecessary complication. If, however, it is retained then the mulit-stage design should be directed as it would be more efficient than a strictly random plot selection.

(e)(4) "…selected within a ~~stand~~strata,…"

(f)(4) All tree heights in plots selected for sequential sampling must be measured. Suggest that this refer to total heights and that merchantable heights be allowed to use taper or regression functions as the measurement error associated with

measuring merchantable heights may be greater than the prediction error of the model; and this is the approach used by FIA so it would be consistent with the common practice estimates.

(l) "…partially pass the paired or unpaired test…"

Equation 8.1: Last two lines should be "If result ≤ n," and "If result > n,"

Table 8.1. Finally, the statistical theory for sequential sampling does not call for a minimum number of passing plots. Avoiding an aberration of result due to random sampling is ensured by the minimum number of plots to be sampled. It is appropriate to pass only one plot to stop the sequential sampling process. *(NFI-3)*

> **Response:** Regarding subchapter 8.1.1(a), there is no language in the Forest Protocol that prevents a project operator from using an unpaired test on a stratum even though paired tests were used on other strata, and vice versa.
>
> The requested modification to subchapter 8.1.1(d) was made in the 15-day changes; therefore, no response is necessary.
>
> The protocol requires selection of plots for both the paired and unpaired test; therefore, ARB staff is unsure what modification to subchapter 8.1.1(e) the commenter is requesting.
>
> Random plot design is not mutually exclusive with evaluation of variability. Verification is a risk-based process that already bases selection of stratum on stocking or risk the sample is unrepresentative. Subchapter 8.1.1(e)(2) simply identifies further criteria for verifiers to consider when selecting plots.
>
> The requested modification to subchapter 8.1.1(e)(4) was made in the 15-day changes so no response is necessary.
>
> Regarding 8.1.1(f)(4), it is appropriate for verifiers to physically measure the tree heights. Project operators are allowed to use regression in creating the inventory. The purpose of the sequential sampling method in subchapter 8.1.1 is for the verifier to determine the accuracy of the project inventory. The verifier must assure that a regression used by the project is accurate
>
> The requested modification to subchapter 8.1.1(l) was made in the 15-day changes so no response is necessary.
>
> The requested modification to equation 8.1 was made in the 15-day changes; therefore, no response is necessary.
>
> Table 8.1 is only slightly modified from the Forest Protocol originally adopted by the Board in 2011 to add requirements for projects that have more than

three strata. ARB staff has determined that it is necessary to have a minimum number of plots sampled during verification to ensure true agreement between the inventory and the verification.

C-8.29. Comment: ***8. Project areas should not be limited to two adjacent Supersections.*** Section 4 of the Protocol allows a project to extend across multiple assessment areas but only two adjacent supersections. There are many parts in the country where three or more supersection boundaries are in close proximity to one another, and a single ownership could span more than two adjacent supersections. Under the current language of the Protocol, such a landowner would be forced to split their property into multiple projects, thereby assuming additional costs with no additional benefit to the climate. Moreover, in parts of the country such as the Northeast land ownership is often fragmented between many small private and family forest owners. Many of these landowners would like to participate in a carbon project if they could collectively group their properties together in aggregation and share in the upfront development and verification costs. Allowing projects to span multiple supersections would allow for greater participation of small landowners in the program and generate additional opportunities for greenhouse gas reductions. *(NFI-3)*

Response: There have been no modifications to the two-supersection limit from the Forest Protocol originally adopted by the Board in 2011. ARB staff previously determined that projects spanning more than two supersections may become too complex because of the presence of multiple assessment areas and Common Practice values. Prior to the adoption of the Forest Protocol adopted by the Board in 2011, ARB staff determined that two supersections was an adequate compromise between excessive project complexity and the economy of scale of larger projects. Additionally, multiple projects may be managed and verified together, which reduces operating and verification costs. Each project will still require a separate verification report and statement.

C-8.30. Comment: ***9. The look-back period for the high stocking reference (HSR) should be clarified.*** Equation 6.6 of the protocol defines the high stocking reference (HSR) as 80% of the highest value for aboveground standing live carbon stocks per acre within the Project Area during the preceding 10-year period. However, if a landowner has recently acquired the land enrolled in the carbon project within the last 10 years, the look-back period should be limited to the length of time that the current landowner has owned the property. Current landowners who want to restore forestland or manage it more sustainably should not be unduly penalized by the management practices of previous landowners. *(NFI-3)*

Response: This subchapter of the Forest Protocol is unchanged from the protocol originally adopted by the Board in 2011. Ten years is an appropriate

timeframe for all projects to ensure that project operators do not attempt to manipulate the baseline by transferring ownership or harvesting, which could result in a reduced minimum baseline.

C-8.31. Comment: 11. There is contradictory language in section on page 115 regarding whether sampling error should be calculated for each carbon pool or all carbon pools together. *(NFI-3)*

Response: There is no contradiction; the sampling error is first calculated for each carbon pool, and then those values are used to calculate the sampling error of the inventory estimate.

C-8.32. Comment: 12. On page 143, cubic feet/ac is a volume metric rather than a basal area metric. *(NFI-3)*

Response: ARB staff agrees with the commenter. The correct metric is volume, so the reference to basal area has been removed as a non-substantive change.

C-8.33. Comment: 13. For effective wildfire risk reduction, fuel reduction activities should be allowed to take place elsewhere on a property for the purpose of reducing wildfire risk on the project area. *(NFI-3)*

Response: Fuel reduction activities can occur anywhere on a property; however, only fuel reduction within the project area would result in a reduction in wildfire risk. While treatments outside the project area may reduce the chances of wildfire spreading to the project area, it would not reduce the spread of wildfire within the project area.

C-8.34. Comment: We do have a few technical concerns, which I think you'll hear later today. Maybe the only one that's unique to us is we're concerned about the baseline carbon level. And we believe that once we're full stakeholders in the process, we can be of some assistance in showing access to different information and some opportunities to maybe bring it more in line with our experience and expectations of managing forest lands in Alaska. *(SEA-1)*

Response: ARB staff is unsure what the commenter is specifically referring to. All comments regarding specific technical concerns that were made during the Board hearing are responded to in this document.

C-8.35. Comment: It was also quite refreshing to hear about the added resources that are going to be dedicated towards early action review. That's certainly welcomed.

My company, we are the oldest and largest offset developer in the United States. We have registered over a third of the forest carbon credits currently in the

compliance program. So we were an early adopter. We've been at this for relatively quite a long time. And our early action projects certainly have been waiting for well over a year for ARB to complete their review. And I would emphasize that that is nothing to disparaging against existing staff. It's just purely there haven't been enough folks working on the review. So that has been certainly welcome to hear that there are several more people that are going to be working on that component. *(BLUESOURCE-4)*

> **Response:** ARB thanks the commenter for their support and continued patience as we address staffing issues to expedite the processing of early action projects.

C-8.36. Comment: Further, as you've heard from others, I think the current process has highlighted the need to more thoughtfully determine a statistically appropriate methodology and timing for updating the common practice values.

If you do adopt the proposed amendment package in its entirety today, I want to emphasize the importance of issuing direction to staff to provide guidance or administrative clarifications for the full range of outstanding issues. And I urge the Board to establish a regular predictable process for forest protocol updates. *(PFT-4)*

> **Response:** Staff conducted an extensive public process to develop the proposed protocols, which is detailed in ARB's response to Comment C-3.1.
>
> As directed by the Board at the hearing to adopt the Forest Protocol, staff is conducting a series of workshops/webinars to allow for stakeholder input in the development of a Forest Protocol guidance document. Draft versions of the guidance document will also be released for public comment prior to finalizing.

C-8.37. Comment: I would like to present a quick example, which has been talked about before, on technical matters. And that has to do with when the split and site class that was done. The FIE site classes go from one from the highest site to seven to the lowest. And this -- it was split -- was moved from between three and four to between four and five. And what this has neglected is that if I put my forest biometrician hat on as a statistician standpoint is it's missed a target population of a forest, and it's included in there a lot of unproductive forests that's not used for timber and could not be used for carbon project.

And therefore, you end up with 80 or 90 percent of the forestland that actually could go into a carbon project is now in the high site class, which isn't -- which is worse than getting rid of the site split, in that it's skewing the common practice numbers and making them unduly high, and not representative of where they should be. *(NFI-4)*

Response: ARB staff participated in a webinar on October 14, 2014, where representatives from the FIA provided detailed information about the development of the Common Practice values, including the public location of all data used (http://www.fia.fs.fed.us/tools-data/), and how the data was used to calculate the Common Practice values provided to ARB by FIA. A copy of the presentation can be found on the ARB website at: http://www.arb.ca.gov/cc/capandtrade/meetings/101414/acr.webinar.us.forestry.slides.pdf.

As explained in the webinar for the Common Practice update in October of 2014, the site class break was based on the data used to determine Common Practice values. Following the same procedures used to determine the original Common Practice values, the Common Practice data was broken into high (site class I-IV) and low (site class V-VII) based on the available data and for consistency across all assessment areas. The break for the Common Practice values must be mirrored in the high and low site class determination for the project. ARB staff intends to work with FIA and stakeholders to develop future updates to the Common Practice values.

C-8.38. Comment: Necessary Clarifications and Details Within the Modified Protocol:

Table 3.1 :Regarding Distribution of Age Classes/Sustainable Management, Table 3.1 states "If even-aged management is practiced, on a watershed scale up to 10,000 acres (or the project area, whichever is smaller), projects must maintain no more than 40 percent of their forested acres in ages less than 20 years. (Areas impacted by Significant Disturbance may be excluded from this test.)"

The watershed scale portion of this requirement is ambiguous and has often left the OPO wondering the intent. If the distribution of age class is to be assessed against watershed size, a more precise definition or measurement method is needed. Further, the noted size appears to be arbitrary and insufficient to ensure adequate age classes exist across all landscapes.

Please consider relegating this requirement to the project area itself, or provide more clarity and guidance regarding the "watershed scale up to 10,000 acres" portion of this requirement. *(ESI-2)*

Response: This subchapter of the protocol is unchanged from the Forest Protocol originally adopted by the Board in 2011. Watersheds are easily definable regions which can be identified from numerous websites including Surf Your Watershed at the U.S. EPA (http://cfpub.epa.gov/surf/locate/index.cfm) so no further definition is necessary. The intent of this requirement is to define a reasonable region

across which the required criteria can be evaluated. If the watershed is larger than 10,000 acres, then a 10,000 acre area will be used for the determination. Staff believes that this will result in a suitable area to ensure adequate age classes exist across all landscapes. If the project area is smaller than the watershed, then the project area will be used for the determination. These criteria can be evaluated using inventories and other records available from the project operator to determine areas of harvest. If the verifier is unable to reach reasonable assurance that this requirement has been met using information provided by the project operator the project would not be in conformance with the protocol.

D. CAP-AND-TRADE REGULATION

D-1. Invalidation

D-1.1. Multiple Comments: Violations (Chapter 3.8 Regulatory Compliance): The protocol language is also unclear regarding what constitutes a violation. Like all compliance protocols, IETA believes it is vital for ARB to ensure that violations unrelated to actual offset project activities will not be grounds for invalidation. Future protocol language should clarify that only fully adjudicated violations, which directly affect the number of credits issued from a project, give rise to potential invalidation. We recommend that only a confirmed formal violation notice should trigger an invalidation investigation. *(IETA-2)*

Comment: In addition, more transparency to what constitutes invalidation would help to instil confidence in the program, reduce risk and minimize verification costs. To this end, development of a regularly updated Frequently Asked Questions document would help to develop a clear and common understanding of regulatory language. Minimizing the possibility for different interpretations of regulatory language and establishing a sound balance between a protocol's rigor and the commercial viability of project development and verification are both key to supporting offset development. *(BPAI-1)*

Comment: I think the second point -- from that we're not just coming up here saying that again and again. We've actually gone to the market and had a successful RFO where we've heard from many people in this room as well. And one of the items -- and I think it was mentioned by a few of the folks here earlier that it's constantly coming up when we went through the RFO process, when we reached out to project developers and the rest was invalidation risk and how the definitions around invalidation, what precisely it means, what things might trigger this, and the rest, it does create problems not just for offset project developers or for project registries,

but for entities, you are regulated under this rule because we're frankly interested in precisely the same things that everyone else is in this room, which is making sure the offsets we're getting are real, verifiable, enforceable, additional, and the rest of the list. *(SCE-1)*

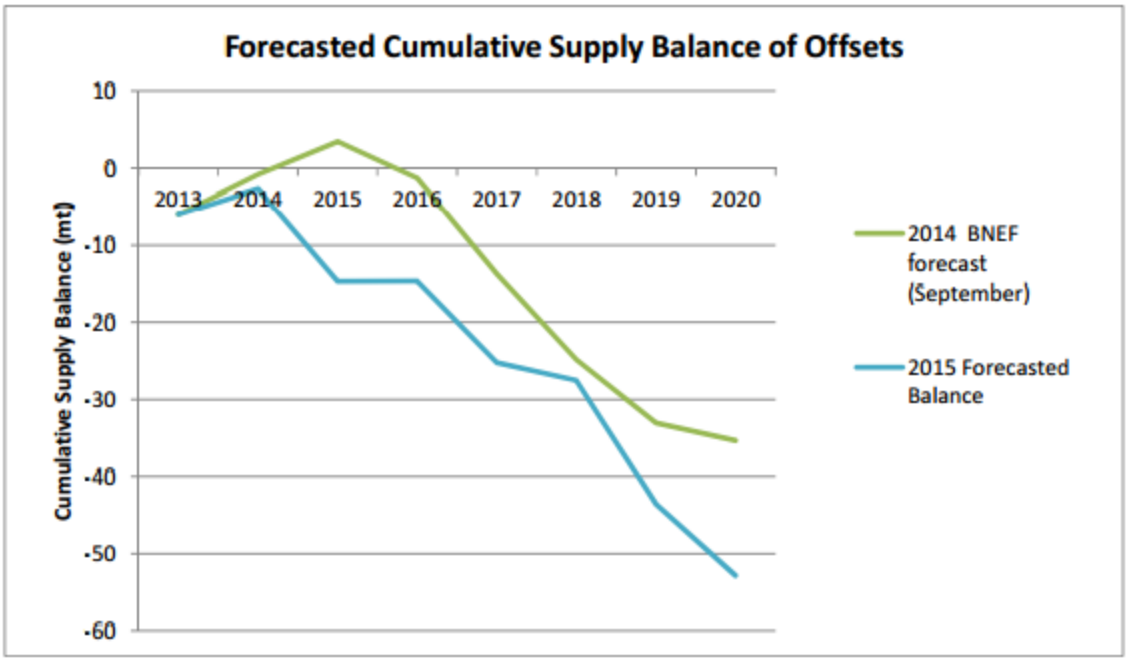
> **Response:** Comments related to offset invalidation and regulatory compliance are outside the scope of this rulemaking process. However, ARB posted a guidance document in February 2015 entitled "California Air Resources Board Offset Credit Regulatory Conformance and Invalidation Guidance" to provide further clarity on regulatory conformance requirements and the scope of activities that are subject to review for each specific project type. ARB staff will continue to discuss these concerns with stakeholders that remain unsure of what constitutes regulatory conformance and which activities and violations may subject the project to the invalidation provisions of the Regulation.
>
> The document is available here: http://www.arb.ca.gov/cc/capandtrade/offsets/arboc_guide_regul_conform_invalidation.pdf
>
> ARB has provided answers to Frequently Asked Questions on many areas of the offset program already and will continue to do so in the future. If project developers or other interested parties have questions related to a specific project, they should contact ARB staff.

D-2. Offset Supply

D-2.1. Multiple Comments: Projected impact on total offset supply

Since 2014, the outlook for the projected supply of offsets has declined significantly. While new protocols have been implemented, the fallout in ODS destruction capacity from the recent Clean Harbors investigation and the proposed changes to the US Forest Protocol risk further contributing to a reduction in the projected supply of high quality emissions reductions from the existing pipeline of projects. The introduction of additional regulatory uncertainty risks further inhibiting the development of future projects.

In attempting to assess the impact of these events on offset supply, we utilized Bloomberg New Energy Finances' (BNEF's) most recent September 2014 offset supply analysis to conservatively estimate the impact on the cumulative supply balance.



Source: Derived from BNEF (2014) and BP (2015) analysis

First we assumed that compliance entities on average use only 75% of the offset quota allowed over this period (i.e. 6% average utilization versus the full 8%) increasing to 90% utilization by 2020. We then updated estimates on ODS and U.S. Forestry offset supply going forward – adjusted conservatively to take into account the impact from the Clean Harbors investigation and the estimated impact from the proposed revisions to the US Forestry Protocol and the actual issuance data from 2014 and so far in 2015. When coupled with BNEF's 2014 total compliance demand forecast, the cumulative supply balance shows the projected offset supply excess or shortfall relative to the market's needs. While in the original BNEF September 2014 forecast, the market was predicted to be short, our updated forecasts show an even more significant shortfall of offset supply.

With regard to forestry offsets, these forecasts have been cross-checked with the leading forest project developers under the Californian Cap-and-Trade program, accounting for over 60% of the total forest carbon credits under the program to date. Across their portfolios, a 40% aggregate reduction in supply is expected out to 2020 as a result of the proposed protocol changes. If these proposed revisions are implemented, we believe it is quite possible we will see an initial rush of forestry project registrations wishing to qualify under the current protocol. However, over the longer term, we would expect to see significant and ongoing reductions in development of forestry projects owing to these proposed changes. Given the brief three-year tenure of the current forestry protocol, the long lead times involved in forestry project development, and the uncertainty of post-2020 offsets policy, the

introduction of such major changes is premature and would further exacerbate offset supply limitations.

While the market is in a significant supply shortfall, we expect the spread between offsets and allowances will diminish to the point where the transaction costs of sourcing offsets and associated invalidation risks will outweigh the cost advantage to be had from the use of offsets. Should such a dynamic persist, liquidity and investment will halt, and the intended cost containment benefits of offsets will be lost.

Understanding the forestry sector implications

If the updated forestry protocol fails to be amended in a manner that is regionally-specific, scientifically-based, commercially-viable, and suited to the forests most at risk of harvest, forest managers may be deterred from sustainably conserving their forests through forestry offset projects – the very program that is intended to engage them. A forecasted 40-60% reduction in leading forestry offset developer's supply pipelines serves as stark warning.

In acknowledging the shortfall in offset supply and on-going challenges resulting from a preference for in-state offset protocols and additionality requirements, priority should be placed on safeguarding and maximizing the offset generation potential of existing CARB approved protocols. Before considering any proposed amendments to the US Forestry Protocol, we strongly urge the Board to require staff to provide:

1. A detailed analysis of the impact on offset supply from the proposed changes to the US Forestry Protocol.

2. More opportunities for stakeholder engagement so that staff can explain and receive expert feedback on the objectives of these significant changes – and whether alternatives exist that would meet these objectives without a large impact on offset supply.

3. A proposal to provide fairness, clarity, certainty, transparency and predictability to investors in offset projects such that significant changes to protocols will occur only after a sufficient period of time has passed so that investors can recoup investments made under the rules in play at the time the investment was made. In no cases should these changes be implemented within a compliance period, with less than 2 years 5 notice to stakeholders from board approval, or within a minimum time period since the previous change. Specific to these contemplated revisions to the US Forestry Protocol, if significant changes are to be made after the additional process and analysis requested by this letter, such revisions should not go into effect before 1/1/18. *(BPAI-1)*

Comment: Since the start of the program only seven forestry projects have received credits using the current protocol. Scoping, feasibility assessments, and building a pipeline of projects under a particular protocol requires significant resources and time. Should the current amendments move forward, efforts by the sector to build a promising pipeline of supply based on the current protocol will be reduced, resulting in not only lost offset supply but also lost opportunities to conserve or more sustainably manage ecologically valuable forest lands throughout the U.S. *(BPAI-1)*

Comment: ACR's Compliance Offset Supply Analysis published in September 2012 (and which has been highly accurate through the first compliance period) forecast a significant offset shortage by 2020. Further, the study highlighted the importance of forest carbon offsets -- forecast as at least 60 million tons through 2020 -- as the largest potential single offset source to fill the supply gap, underscoring the importance of this offset type for keeping costs in check. *(ACR-3)*

Comment: Furthermore, if these proposed revisions are adopted, The Trust believes they will serve to drastically undermine this nascent market by reducing the willingness of forest landowners to participate in carbon offset markets.

The Climate Trust recognizes and appreciates the great amount of work that ARB staff have already dedicated to developing a clear and robust protocol. The California offset market is a leading example of progressive and effective climate change policy, and it is critical that it remain not only transparent and robust, but also a viable offset marketplace. The Trust respectfully submits this letter in the spirit of collaboration and we look forward to continuing to work with vested stakeholders and ARB staff to increase the integrity and strength of the compliance offset market. *(TCT-1)*

Comment: It is important to note that since the launch of the program in January 2013 only seven (7) compliance forestry offset projects have received ARBOCs. This is due to the uniquely time consuming nature of forest carbon offset project origination, contracting, development, registration and verification. The steps required to develop a pipeline of qualified projects under a particular offset protocol require significant resources and time. Project developers often spend over a year negotiating with forest owners before project development begins, which often means two to three years elapse between initial discussions and the issuance of ARBOCs. Substantial investments are made during this time - even before the project can be listed – including the costs to conduct feasibility assessments (under the published version of the protocol), legal fees for contracting with landowners, and costs for land appraisals and preparation of a forest inventory.

We are in daily contact with Forest Offset Project Operators, Authorized Project Designees, technical consultants, investors, offset buyers and other key

stakeholders who have expressed significant concerns about the large-scale impacts of the proposed forestry protocol updates on project pipelines, offset volume, market participation and market confidence. Should the current forest protocol amendments be approved, offset project developers and forestland owners have informed us that 50% of the pipeline of forest projects in which they have invested will no longer be technically or economically feasible. In throttling much of the supply that was developing, the changes would convey to landowners that investing time and effort in project development is itself high risk, increasing the risk premium investors will attach to future investments in the offset market and thereby increasing the cost of future offsets. The resulting impact on program participants' confidence extends more broadly than the forestry sector, signaling the future possibility for unplanned intervention by ARB and discouraging investment in the offset program on a whole - further risking future offset supply and cost containment. *(ACR-3)*

Comment: Economists and market experts have observed that cost containment measures will become increasingly important as California's C/T program matures, given uncertainty about future technology and market developments and especially as emission targets become more stringent in a post-2020 program environment. As the cap continues to decline and localized emission reduction opportunities diminish, stimulating emission reductions from sources outside the cap becomes increasingly important. In this context, the current and future viability of offset protocols will be critical to the success of California's climate emission reduction programs.

ARB's original offset market design, while overly cautious in terms of geographic and use limitations, provided a reasonable framework for development of an offsets market. However, the proposed changes would undermine the technical integrity of this framework and erode investor confidence in the offset market. We are disappointed that ARB appears to be staying the course it charted in the Fall of 2014, despite valid stakeholder objections to proposed protocol changes and ARB's decision in October to defer Board action in the interest of better understanding the potential impact of those changes on future offset opportunities from forestry projects. Changing protocols in ways that devalue projects already under development will create an atmosphere of uncertainty, chilling the market and negatively impacting participation by project developers and buyers of forward contracts. *(WSPA-1)*

Comment: Market Receptivity to Current and Future Protocols will Influence Long Term Program Success

WSPA shares ARB's previously stated concerns about the potential for a shortfall in offsets supply. We maintain that the success of California's C/T program, and of the broader effort to meet long term GHG emission reduction targets, depends in

significant part on ARB collaborating with the private sector and other regulatory jurisdictions on creative, flexible strategies to increase offsets supply. In addition to expediting development of new offset protocols, ARB must also ensure that existing protocols such as the US Forestry Offsets Protocol are implemented in a manner that will encourage participation by the intended project developers and in turn maximize the supply of environmentally sustainable offsets. *(WSPA-1)*

Comment: We submitted comments earlier, and I will only highlight them here. As WSPA stated in the past, we have significant interest in the offsets program, because of the important role offsets play in a well structured market-based system. We support a vigorous offset program. Such a program will increase in importance as the cap continues to decline and localized emission reduction opportunities diminish.

It is clear that the current and future viability of offset protocols will be critical to the success of California's GHG emission reduction program. Today, I speak on two issues, and I'll describe them very briefly.

ARB's original offset market design, while cautious in terms of geographic and use limitations provided a useful framework for the development of an offsets market.

However, the proposed changes for the forestry protocol would undermine the technical integrity and the framework and erode consumer and investor confidence in the offset market by creating uncertainty.

Specifically, ARB's proposed changes to the compliance offset protocol for the Forest projects appear to be based on an incorrect baseline that will further diminish the supply of offsets obtained from qualifying forestry projects. *(WSPA-2)*

Comment: We're concerned about the large impact this is going to have on a protocol that has been looked at as very promising. By our numbers, these revisions will reduce potential future supply by some 40 to 60 percent. That's a big number, and I'm not sure that's been discussed. It seems like the impact on supply of offsets from the revisions would have an impact on your thinking here.

So while that's significant on its own, we also view it a symptom of a larger problem. There's a lot of warning signs in the offset program right now. There's been concerns for a long time about the limits on use of offsets. There's been concerns about the small handful of protocols that we have approved to date pretty far into the program. We have limited geography from which offsets can be sourced, including inability to source them in places like Mexico, where there's great potential. And Mexico is even called out for in the regulation.

We've also seen a chilling effect from the recent ODS invalidation investigation. It appears also that RPs, for whatever reason, regulated parties, are not using their full

allotment of offsets, for whatever reason that may be, a view of the risk or something else.

And if all offsets aren't used, it impacts all regulated parties, because it increases the demand for allowances unnecessarily. First of all, we have to be very careful about moving this protocol forward without being sure that we utilizes all the expertise, and without being sure of the impact on supply. And secondly, in a bigger picture sense, we need a process in place to look at these warning signs in the offset market, and look at the impact cumulatively of everything that's been happening lately, just to make sure we're getting the proper balance between maintaining the environmental integrity of the program, and getting the full cost containment benefit from the program. *(BPAI-2)*

Comment: Additionally, the Trust believes it is critical for ARB to consider the importance of encouraging continued market participation, rather than prematurely restricting this relatively young and still maturing sector. *(TCT-2)*

Comment: Second, the changes will dramatically impact offset supply. Should the current protocol amendments be approved, 50 percent of the pipeline of forest project in which investments have been made will no longer be technically or economically feasible. *(ACR-5)*

Comment: Given the nascent state of the California Program, it is crucial that carbon market participants feel secure that the rules underpinning the ARB offset system are stable and will not be subjected to frequent and unpredictable modification. The current Protocol has been in use for less than three years, and, during that time, has provided a foundation on which only a small group of forest offset projects have been established. The introduction of the significant changes proposed in the protocol update will unnecessarily shake this foundation and deter forest landowners from participation in the program. *(BLUESOURCE-5.)*

Comment: If implemented in their current form, the three proposed protocol changes mentioned above will render many strong forestry projects unviable, thereby eliminating the significant climate benefits these projects would have produced and profoundly diminishing the forest offset supply. Our estimates, and those of other forestry-centered project developers', project a 40%-60% reduction in future forest offset supply.

To avoid a loss of program confidence, an increase in ARB staff workload, and a significant decline in offset supply, we encourage ARB to adopt our proposed solutions for addressing the three key issues discussed in this letter. *(BLUESOURCE-5.)*

Comment: Southern California Edison, I think you would see a theme if you look at our comments on the offset market. And it's trying to encourage as much as we can

the supply because we view in the long term and right now a robust offset market is key to cost containment. And that even gets more so as we come closer and closer to the year 2020. *(SCE-1)*

Response: The changes staff has made to the protocol reflect the latest science and data, reflect changes to protocols in the voluntary market to ensure ARB's protocols are at least as rigorous as those in the voluntary market, and clarifies ambiguous portions of the protocol to be consistent with the California Forest Practice Rules. ARB staff has determined these changes were necessary to protect the integrity of the program and facilitate implementation of the protocol. ARB staff will continue to evaluate all protocols and provide updates as necessary. ARB staff will hold a workshop to solicit stakeholder input on the frequency and timing of future forestry protocol updates.

The changes staff has made to the protocol reflect the latest science and data, reflect changes to protocols in the voluntary market to ensure ARB's protocols are at least as rigorous as those in the voluntary market, and clarifies ambiguous portions of the protocol to be consistent with the California Forest Practice Rules. ARB staff has determined these changes were necessary to protect the integrity of the program and facilitate implementation of the protocol. ARB staff will continue to evaluate all protocols and provide updates as necessary. ARB staff will hold a workshop to solicit stakeholder input on the frequency and timing of future forestry protocol updates.

The commenters are concerned the proposed changes to the Forest Protocol will result in reduced offset supply. While offset supply is an important factor, assuring that all ARB offsets represent real, permanent, quantifiable, verifiable, enforceable, and additional GHG emission reductions and GHG removal enhancements is also important. ARB has taken several steps to address offset supply concerns. In addition to the four originally approved protocols in 2011, ARB added a MMC Protocol, is proposing to add a Rice Protocol, and extend the geographic scope of the current Forest Protocol to include Alaska. ARB staff will continue to evaluate and propose new offset protocols that will generate compliance offset credits that meet AB 32 criteria. There is no indication that all possible projects have been implemented under the existing protocols. Offset projects are price responsive. If there is a clear demand for offsets, which may be indicated by increasing prices for allowances, project developers will respond by undertaking more projects with the expectation of higher returns on investment.

The updates to the Forest Protocol were first proposed in 2014 and heard at the October 2014 Board hearing. At the October Board hearing, ARB staff

was directed to not move forward with the Common Practice updates to the Forest Protocol until the next round of updates. This provided an additional nine months for interested parties to engage with staff on the proposed changes and prepare and submit documentation to establish forestry offset projects under the previous version of the protocol. For similar reasons, ARB staff also updated other compliance offset protocols in 2014 to address quantification accuracy, update to the latest science, and provide additional clarity. Interested parties did not identify similar concerns to oppose those specific updates or their timing.

D-3. General Support

D-3.1. Multiple Comments: We do, however, strongly support the proposed 15-day modifications to Sub-Chapter 10, Article 5, sections 95802, 95973, 95975, 95976, 95981, and 95985, including but not limited to inclusion of Alaska into the Forest Protocol, clarification of the treatment of Early Action reforestation projects, and acceptance of the Compliance Offset Protocol for Rice Cultivation. We see no reason to delay these changes. *(PFT-2)*

Comment: CCEEB strongly supports a number of the proposed 15-day modifications, including the incorporation of Alaska into the Compliance Offset Protocol for U.S. Forest Projects and introduction of the Compliance Offset Protocol for Rice Cultivation Projects. The Board should vote to approve these two items during its June 25, 2015 Board Hearing. Doing so will support the continuation of a robust offset market that not only delivers greenhouse gas reductions and supports cost containment within the Cap-and-Trade program, but also delivers substantial ecological benefits and demonstrates California's role as a global leader in climate action. *(CCEEB-1)*

Comment: First, I'd like to state our strong support for the new rice protocol, and addition of Alaska into the existing U.S. Forestry Protocol. *(PGE-3)*

Comment: As you've seen, there's a diverse set of stakeholders in this room that share mutual concern with regards to the technical provisions of the update to the U.S. Forestry Protocol, while at the same time supporting the rice cultivation protocol and the inclusion of Alaska. *(CCEEB-2)*

Response: ARB thanks the commenters for their support.

E. COMMENTS UNRELATED TO THE PROPOSED AMENDMENTS

E-1. Early Action Offset Project Review

E-1.1. Comment: Currently, there are two types of carbon offsets that ARB staff reviews for compliance purposes in the Cap-and-Trade Program, those utilizing early action protocols, and those utilizing compliance protocols.

The ARB Cap-and-Trade Regulation requires ARB to review compliance reporting periods within 45 calendar days. However, there is no regulatory timeline specified in the regulation for ARB to review of an early action reporting period.

We have been told that additional staff and resources have been allocated in the offset group to help expedite early action projects, and we're very supportive of this work continuing.

We greatly appreciate ARB responding to these requests from the offset community. In the future, we feel that it would make sense to have equal review times for both compliance and early action offset projects. This policy equality would provide project developers with certainty that both compliance and early action reporting periods begin review within 45 days.

This will also ensure that early action projects are not unfairly penalized and that project developers and investors are rewarded for heeding ARB's request to seek and reduce emissions early on in the program.

In addition, we respectfully request clarification from ARB on submission deadlines for early action offset reporting periods, since the January 1st, 2016 and August 31st, 2016 approval deadlines for early action offset credit listings and ARB OC issuances respectfully are fast approaching. *(CE2-3)*

> **Response:** This comment is outside the scope of this rulemaking process, therefore no response is required.

VI. PEER REVIEW

California Health and Safety Code section 57004 sets forth the requirements for peer review of identified portions of rulemakings proposed by entities within the California Environmental Protection Agency, including ARB. Specifically, the scientific basis or scientific portion of a proposed rule may be subject to the peer review process. Here, ARB determined that the rulemaking at issue does not contain a scientific basis or a scientific portion subject to peer review, and thus ARB did not need to perform a peer review, as stated in section 57004.

Response to Comments

on the Environmental Analysis

Prepared for the

PROPOSED AMENDMENTS TO THE CALIFORNIA CAP ON GREENHOUSE GAS EMISSIONS AND MARKET–BASED COMPLIANCE MECHANISMS

(CAP -AND- TRADE REGULATION)

California Environmental Protection Agency

Air Resources Board

To be considered at the

June 25, 2015 Board Hearing

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1.0 INTRODUCTION

To meet the requirements of the California Air Resources Board's (ARB) certified regulatory program under the California Environmental Quality Act (CEQA), ARB staff prepared environmental analyses (EA) as part of the Initial Statement of Reasons (ISOR) for the proposed amendments to the California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms Regulation (Cap-and-Trade Regulation or Regulation) to add one updated offset protocol (Compliance Offset Protocols U.S. Forest Projects) and one new offset protocol (Compliance Offset protocol Rice Cultivation Projects), hereinafter referred to as Proposed Protocols. A draft EA specific to the newly proposed Compliance Offset Protocol Rice Cultivation Projects (Rice Protocol) is included in Chapter Ill of Appendix B of the Staff Report, and a draft EA specific to the proposed update to the Compliance Offset Protocol U.S. Forest Projects (Forest Protocol) is included in Chapter Ill of Appendix C of the Staff Report.

The ISOR for the Proposed Protocols was released for a 45-day public review period from October 28, 2014 to December 15, 2014. Subsequent to the Board hearing held in December 2014, one separate notice with modified regulatory language, reflecting changes directed by the Board at the hearing, was circulated for a period of 15 days as required by the Administrative Procedures Act. The changes reflected in the 15-day notices did not affect the compliance responses to the Proposed Protocols in any way that affected the conclusions of the environmental analyses included in the Staff Report of each within the ISOR, so no revision to or recirculation of the environmental analysis was required.

This document presents written responses to comments received during the 45-day and 15-day comment periods that raise environmental issues. These comments are only a subset of all the comments received. Substantive responses in this document are limited to comments that "raise significant environmental issues associated with the proposed action," as required by ARB's certified regulatory program at California Code of Regulations, title 17, section 60007(a). ARB conservatively included comments and responses in this document if the comment raises an environmental issue related to the proposal even if the comment does not

directly relate to the adequacy of the environmental analyses. This document includes responses to environmental comments received outside of the 45-day comment period provided for review of the EAs, namely comments received during the subsequent 15-day comment period provided for purposes of the Administrative Procedure Act, even though the EAs were not recirculated or reopened for public review during that time. The Board will consider these written responses for approval as part of its consideration of final action on the amendments.

Written responses to all public comments received have also been prepared for purposes of the Administrative Procedure Act in the Final Statement of Reasons (FSOR). The FSOR will be posted in electronic form on the ARB Cap-and-Trade Rice and Forestry Protocols rulemaking webpage when the regulatory package is submitted to the Office of Administrative Law for review and approval. The rulemaking webpage for the Amendments to the California Cap on Greenhouse Gas Emission and Market-Based Compliance Mechanism to add the new Rice Protocol and updated Forest Protocol can be found at the following link: http://www.arb.ca.gov/regact/2014/capandtradeprf14/capandtradeprf14.htm

A. Requirements for Responses to Comments

These written responses to public comments on the EAs are prepared in accordance with ARB's certified regulatory program to comply with the CEQA. ARB's certified regulations (17 CCR 60007, *Response to Environmental Assessment*) state:

> *(a) If comments are received during the evaluation process which raise significant environmental issues associated with the proposed action, the staff shall summarize and respond to the comments either orally or in a supplemental written report. Prior to taking final action on any proposal which significant environmental issues have been raised, the decision maker shall approve a written response to each such issue.*

Public Resources Code section 21091 also provides direction regarding the consideration and response to public comments in CEQA. While the provisions refer to environmental impact reports, proposed negative declarations, and mitigated negative declarations, rather than an EA under ARB's certified regulatory program, this section of CEQA contains useful guidance for preparation of a thorough and meaningful response to comments. Public Resources Code §21091(d) states:

(1) The lead agency shall consider comments it receives … if those comments are received within the public review period.

(2) (A) With respect to the consideration of comments received …, the lead agency shall evaluate comments on environmental issues that are received from persons who have reviewed the draft and shall prepare a written response pursuant to subparagraph (B). The lead agency may also respond to comments that are received after the close of the public review period.

(B) The written response shall describe the disposition of each significant environmental issue that is raised by commenters. The responses shall be prepared consistent with section 15088 of Title 14 of the California Code of Regulations, as those regulations existed on June 1, 1993.

California Code of Regulations, title 14, section 15088 (CEQA Guidelines) also includes useful information and guidance for the preparation of a thorough and meaningful response to comments. It states, in relevant part, that specific comments and suggestions about the environmental analysis that are at variance from the lead agency's position must be addressed in detail with reasons why specific comments and suggestions were not accepted. Responses must reflect a good faith, reasoned analysis of the comments. California Code of Regulations, title 14, section 15088(a-c) states:

(a) The lead agency shall evaluate comments on environmental issues received from persons who reviewed the draft EIR and shall prepare a written response. The Lead Agency shall respond to comments received during the noticed comment period and any extensions and may respond to late comments.

(b) The lead agency shall provide a written proposed response to a public agency on comments made by that public agency at least 10 days prior to certifying an environmental impact report.

(c) The written response shall describe the disposition of significant environmental issues raised (e.g., revisions to the proposed project to mitigate anticipated impacts or objections). In particular, the major environmental issues raised when the Lead Agency's position is at variance with recommendations and objections raised in the comments must be addressed in detail giving reasons why specific comments and suggestions were not accepted. There must be good faith, reasoned analysis in response. Conclusory statements unsupported by factual information will not suffice.

B. Comments Requiring Substantive Responses

Staff is required to prepare substantive responses only to those comments that raise "significant environmental issues" associated with the proposed action as required by California Code of Regulations, title 17, section 60007(a). A total of eighty eight (88) comment letters were submitted on the comment docket for the Proposed Protocols that was open until December 15, 2014, and during the Board hearing held on December 18, 2014. ARB staff determined that the comment letters included in this Response to Environmental Comments document have mentioned or raised either an issue related to the EA's adequacy, or an environmental issue related to the Draft EAs. Staff was conservatively inclusive in determining which comments warranted a written response in this document . Staff will respond to all comments in the Final Statement of Reasons.
Public comments and staff responses related to the proposed Protocols are available on ARB's website
at: http://www.arb.ca.gov/regact/2014/capandtradeprf14/capandtradeprf14.htm.
Those comments were considered by staff and provided to the Board members for their consideration.

2.0 RESPONSES TO COMMENTS

ARB received a total of eighty eight (88) comment letters during the 45-day and 15-day comment periods. Only those comment letters that mentioned or raised an issue related to the EA, or an environmental issue, are included in this document. The list below identifies those commenters, along with the Comment ID number assigned when the letter was submitted to the electronic docket and is also used to identify the comment in the written responses. All comment letters and attachments received on the Proposed Protocols are posted on the ARB website, with comments ordered by date received, and grouped by review period. These comments may be viewed at the following link:
http://www.arb.ca.gov/lispub/comm/bccommlog.php?listname=capandtradeprf14

Abbreviation	Commenter
ACR1	Jessica Orrego and Stewart McMorrow, American Carbon Registry Written Testimony: December 15, 2014
ACR2	John Kadyszewski, American Carbon Registry Written Testimony: June 4, 2014
AFT1	James Daukas, American Farmland Trust Written Testimony: December 14, 2014

Abbreviation	Commenter
BM1	Richard Saines, Baker & McKenzie LLP Written Testimony: June 3, 2015
BS1	Roger Williams, Blue Source Written testimony: June 3, 2015
CBD1	Brian Nowicki, Center for Biological Diversity (Rice Protocol) Written testimony: June 4, 2015
CBD2	Brian Nowicki, Center for Biological Diversity (Forest Protocol) Written testimony: June 4, 2015
CW1	Alex Rau, Climate Wedge LLC Verbal Testimony: December 18, 2014
EDF1	Robert Parkhurst, Environmental Defense Fund Written Testimony: June 4, 2015
ESI1	Richard Scharf, Environmental Services, Inc. Written Testimony: December 12, 2014
FCC1	Sean Carney, Finite Carbon Corporation Written Testimony: December 15, 2014
FCC2	Sean Carney, Finite Carbon Corporation Written Testimony: June 4, 2014
FRAQMD1	Christopher Brown, Feather River Air Quality Management District Written Testimony: December 15, 2014
FWW1	Wenonah Hauter, Food and Water Watch Written Testimony: December 15, 2014
IETA1	Katie Sullivan, International Emissions Trading Association Written Testimony: June 4, 2015
NAFO1	David Tenny, National Alliance of Forest Owners Written Testimony: December 15, 2104
OCSEES1	James Tansey, Offsetters Climate Solutions and Era Ecosystem Services Written Testimony: December 15, 2014
PI1	Matthew Keene, Private Individual Written Testimony: November 11, 2014

Abbreviation	Commenter
PI2	Todd M Shuman, Private Individual Written testimony: June 3, 2015
PFT1	Constance Best, Pacific Forest Trust Written Testimony: June 4, 2015
SF1	Ara Marderosian, Sequoia ForestKeeper Written Testimony: June 3, 2015
SIG1	Charles Kerchner, Ph.D., Spatial Informatics Group LLC Written Testimony: December 15, 2014
SPI1	Edward Murphy, Sierra Pacific Industries Written Testimony: December 15, 2014
SU1	Aaron Strong and Barbara Haya, Stanford University Written Testimony: December 15, 2014
UCB1	William Stewart, University of California, Berkeley Written Testimony: December 15, 2014
WC1	Edie Sonne Hall, Weyerhaeuser Company Written Testimony: December 15, 2014

The comments are responded to in the following format:

Comment: *Comments received under the COMMENT ID are presented individually as shown in this example, beginning with the* ***Comment*** *on the first line, followed by the COMMENT ID in parenthesis [e.g.; (ABC2)].*

> **Response:** *ARB written responses are presented following each comment, or following a group of similar comments.*

Proposed Compliance Offset Protocol Rice Cultivation Projects

Rice Nitrogen Emissions

Comment: I am concerned with the proposed amendments regarding rice cultivation. I agree that methane levels should be reduced, but the proposed changes increase nitrogen levels. Nitrogen is more of a concern in regards to ground level air pollution. There are numerous CARB programs aimed at reducing oxides of nitrogen (NOxs) and this seems contradictory. In addition, what will this program of increased periodicity of drainage do to water consumption? Thank you for the ability to be heard. (PI1)

> **Response:** Commenter is concerned about changes in nitrogen levels. Nitrogen is the major component (approximately 78%) of the air we breathe. The proposed Rice Cultivation Projects Compliance Offset Protocol (Rice Protocol) should result in no changes to nitrogen levels. If the commenter is referring to emissions of nitrous oxide (N_2O) as a result of fertilizer application, the proposed Rice Protocol accurately accounts for any increased N_2O emissions and debits any emission increases from the methane emission reductions. Nitrogen oxides (NOx) are environmentally distinct from nitrogen, and are primarily a result of fossil fuel combustion. The air quality impacts of the proposed Rice Protocol are addressed in subsection III.C.3.c of the Environmental Analysis. Due to the expected similar fuel consumption between current agricultural practices and modified agricultural practices, any increases in air pollutant impacts (both toxic air containments and criteria pollutants) that may result from modified cultivation practice would be negligible and less than significant.
>
> As to the second question about changes in water consumption due to the increased periodicity of drainage, the implementation of Alternate Wetting and Drying in the Mid-South region would likely have a beneficial impact on water usage. Instead of being required to constantly add water to a field to maintain flooding during the entire growing season, the farmer will periodically cease irrigation and allow the field to drain down for a few days before reflooding. This will likely result in less water usage by fields participating in this activity.

Comment: We raise a continued concern, however, with the inclusion of the N2O term in the protocol: if the DNDC model fails to capture spikes generated by drying out fields, the model's reported average project reporting period N2O emissions (N2OP,i) may be a significant underestimate for some fields. (SU1)

> **Response:** The commenter is referring to emissions of N_2O as a result of fertilizer application. The Air Resources Board (Board or ARB) is confident the DNDC model accurately captures N_2O emissions. Spikes result mainly from draining a field too soon after fertilizer application. This is unlikely to happen because farmers do not want to waste fertilizer and the common schedule for drying allows adequate time for fertilizer uptake. Additionally, the protocol takes a conservative approach in dealing with N_2O emissions, Reductions in N_2O emissions are not eligible for crediting; however increases in N_2O emissions are debited from the total project emission reductions. As a result there will be an overall reduction of greenhouse gas (GHG) emissions from these projects taking into account methane, N_2O, and soil organic carbon.

Rice Water Usage

Comment: The proposed rice cultivation offsets also have a highly dubious aspect in that offsets will be generated from rice cultivated in the Sacramento Valley area of California — an area that is experiencing the highest level of drought and water shortages in California. It's beyond appalling that offsets could be generated from an agricultural practice that now relies on pumped ground water to continue production in the midst of one of the worst droughts in California in 1,200 years. Polluters will be able to continue emissions at the source and buy offsets from rice cultivation, which will support and further engrain this water intensive crop doing nothing to resolve the drought and allowing precarious emissions reductions. (FWW1)

Comment: The current draft of the protocol includes the eligibility requirement:

Offset projects developed using this protocol must: Grow rice of the same maturity characteristics during the crediting period as the baseline period.

This requirement could create a disincentive for farmers to switch to shorter duration rice.

Shorter duration rice would use less water, and may result in less methane emissions on average because of a shorter flooding season. It is possible that there could be a business-as-usual shift toward shorter duration rice varieties in both California and the Mid-South, in part, due to the lower water requirements of such varieties. Because of the water use benefits, and possible emissions benefits, we believe that it is important that the protocol avoid creating a disincentive to switch to shorter duration rice. (SU1)

> **Response:** In response to the two comments above, rice cultivation offsets do not provide sufficient financial incentive to either prevent switching to a shorter duration rice strain or maintain a long duration rice strain that is not financially viable. A University of California Davis (UC COOP, 2012 from ISOR) study estimated the average cost per acre for rice farming in 2012 in the Sacramento Valley is $1600/acre. The estimated highest offset generation from implementing all eligible activities is about 0.5 offsets per acre. At an estimate of $10/offset, the most a project can expect to generate from offset revenue is $5 an acre, which does not account for the expense of annual monitoring, reporting, and verification, or hiring consultants to assist farmers through the complex protocol. So offsets are expected to reduce the cost of rice farming by less than 0.5%. While switching strains may result in reduced methane emissions, the presence of an offset protocol would not substantially influence either switching strains or water usage. Additionally, none of the eligible activities would lead to increased water usage at existing farms.

Rice Straw Burning Baseline Emissions

Comment: Specifically, in our review of the protocol, we see open filed burning referenced in the table on page 21, however, we don't see a factor either described in narrative or in any of the baseline equations that take it into account. Section 5.2.2 starting on page 24 and ending on page 39 describes accounting for Unadjusted Baseline Emissions. Starting on page 29, section 5.2.2.1 specifies how the baseline

is established. On page 29, through page 31 specific parameter are described - d - l, as specified in 5.2.2.1(c). None of these includes open field rice straw burning. Only equation 5.6 explicitly includes a parameter for rice straw burning emissions, and subtracts from project benefits. Equation 5.10 is used to calculate straw burning emissions. There is no similar equation that we can find that performs a similar calculation to establish straw burning emissions in the baseline.

Perhaps burning emissions is a parameter built into the DNDC model, but nowhere is that explicitly stated. Appendix A, (a) (4) does require general information of post-harvest residue management, (description and dates) but not quantification. Therefore, from our review it seems that the calculations for the baseline do not adhere to the stated goals of SSR7 in the table on page 21. (AFT1)

> **Response:** The comment above does not raise any significant environmental issues associated with the proposed protocols, or the adequacy of the environmental analyses; however, in the interest of providing information, ARB has provided the following response.
>
> Secondary emission source calculations handle baseline emissions differently than primary emission source calculations. Both the baseline and project emissions from rice straw burning are included in equation 5.10. The term $Area_{BR,B,i}$ accounts for the baseline rice straw burning.
>
> Under CEQA Guidelines (14 CCR 15204(b)), reviewers should focus on the finding that the project will not result in any significant adverse impacts on the environment. In accordance with ARB's certified regulatory program (17 CCR 60007(a)) and the CEQA Guidelines, no revision or further written response is required in response to this comment.

Rice Straw Burning and PM Emissions

Comment: The first comment is regarding the impact of the protocol to the rice straw burning program. Page 32 section ii contains a brief discussion of the Connelly-Areias-Chandler Rice Straw Burning Reduction Act of 1991 and the Conditional Rice Straw Burn Permit Program. These regulations are the framework

for the rice straw burning program. However at no place here or elsewhere in the document is there any discussion of the impact of the proposed action on the rice straw burning program. Given that the purpose of the rice straw bring program is to reduce the public exposure to particulate matter (PM) the CEQA equivalent document should identify and discuss any impacts, or lack of impacts, on the rice straw burning program for the proposed action.

…

The final comment is on dust generation. The Staff Report on page 37 postulates a change from aerial seeding to "dry seeding activities," but does not identify or discuss any fugitive dust emission that might result from these activities. It is reasonable to assume that dry seeding activities will be done using off road equipment driving over a dry field. This will generate dust in the fields while working and could break the surface crust of the soil creating additional dust in the fields during high wind events. Fugitive dust emissions from agricultural operations can be a significant source of PM emissions, although the increases resulting form the change from aerial to dry seeding may not result in a significant increase in PM emission. This impact should be identified and discussed in the Environmental Analysis. (FRAQMD1)

Response: As noted by the commenter, subsection III.C.1.c.ii of the Environmental Analysis prepared for the proposed Rice Protocol contains a comprehensive review of the regulatory setting for burning. As discussed in subsection II.C.1, rice straw burning is highly regulated in California. Rice growers must secure Burn Permits and comply with other requirements before burning straw. Since baling would not be an eligible project activity, ARB does not anticipate any changes in burning practices as a result of the Rice Protocol. Therefore, the proposed Rice Protocol would not cause any significant impacts due to changes in rice straw burning.

With regard to the comment on potential dust generation, subsection III.C.1.c.i of the Environmental Analysis prepared for the proposed Rice Protocol discusses the regulatory setting for dust (particulate matter). This section provides the legal framework for PM10 regulation associated with the agricultural sector. U.S. EPA issues national standards and designates the "nonattainment areas" that must reduce pollution in order to meet them, generally basing these designations on data collected at air quality monitoring

stations. Based on this data, States then determine what pollution reduction steps will be and outline those steps in plans known as “state implementation plans.” Each state determines how to reduce a nonattainment area’s pollution to meet the standards in a way that makes the most sense for that area. The California air districts that have chosen to address PM10 emissions from agriculture have typically done so by incorporating conservation management practices developed with growers and the U.S. Department of Agriculture into PM10 implementation plans for those nonattainment areas. These conservation management practices are written into enforceable air district rules in districts that have found it necessary to limit PM10 emissions from agriculture. The ambient air quality standards, along with regional PM10 implementation plans (where applicable), ensure that PM10 emissions from the agricultural sector remain within acceptable levels.

However, it is impossible to predict the impact on PM10 levels from switching from wet seeding to dry seeing for a specific field due to the variability in seeding techniques as well as the local climate. Dry seeding can be done on a variety of soil types, by tractor or airplane, on dry to moist soil, and can result in changes to field preparation. All of these site-specific considerations determine whether dry seeding would increase or decrease PM10 emissions from the existing setting. As noted above, local and regional regulations and implementation plans ensure that any potential increases in PM10 emissions would remain less than significant.

Furthermore, to ensure that all offset projects comply with all applicable regulatory requirements, Section 95973(b) of Title 17 of the California Code of Regulations provides that “[a]n offset project is not eligible to receive ARB or registry offset credits for GHG reductions or GHG removal enhancements for the entire Reporting Period if the offset project is not in compliance with regulatory requirements directly applicable to the offset project during the Reporting Period.” Additionally, the proposed Rice Protocol requires all offset projects to be developed in compliance with all federal, state, and local laws, regulations, ordinances, and any other legal mandate, including all CEQA and National Environmental Policy Act (NEPA) requirements, where applicable. The Offset Project Operator or Authorized Project Designee for an offset project is required to attest to ARB that their project meets these

requirements. If during verification it is found that the offset project does not meet any of these requirements, the project is ineligible to receive ARB offset credits for the entire reporting period. Therefore, the analysis completed in subsection III.C.3.c accurately concludes that any potential air quality impacts from rice straw burning or PM10 emissions would be less than significant due to the requirement that all offset projects comply with all applicable federal, state, and local laws and regulations.

Rice Straw Removal

Comment: We understand that baling was removed from the initial discussion draft of the Draft Protocol over ARB's concerns on the potential impacts to migratory waterbirds that currently rely on winter flooding of rice fields for certain habitat needs. In our prior comments filed on April 1, 2014, we stated that we were concerned about the scientific robustness of the Point Blue Conservation Science report entitled "*Assessing the Environmental Trade-offs of Greenhouse Gas Emission Reduction in California's Rice Fields: The Effect of Baling on Waterbird Use of Winter Flooded Rice Fields, Interim Sub-Report*." (Point Blue Report) We also stated that we would further investigate this matter and report our findings back to ARB.

Two separate well established and highly regarded wildlife ecologists, Joe Drennan and Tamara Klug, reviewed and critiqued the Point Blue Report. We attach to our comments the findings and reports from these wildlife ecologists along with their curriculum vitaes as Exhibits A and B, respectively (collectively, the Ecologists' Reports). In short, the Point Blue Report should not be relied upon by ARB in setting important policy, including regarding the eligibility of baling under the Draft Protocol. The Point Blue Report is replete with statistical and methodological flaws to point of being wholly unreliable as a basis for policy decision making.

Separately, Ms. Klug further considered the science behind the current mix of rice cultivation practices in California and the wide and varied number of waterbird species that utilize the winter flooded rice fields for habitat as part of their annual migration. It is clear that there are numerous bird species that migrate through California each year. It is also clear that different species have different habitat

needs. Not all of the ideal habitat conditions exist with the predominant current practice of deep flooding depths for post harvest rice fields. In fact, many species of waterbirds that migrate through California each year prefer shallower flood depths to meet their habitat needs than those required to decompose the rice straw where such straw is not removed from the field after harvest. Where baling occurs post harvest, the level of flood depth (and water used for such purpose) can be much lower. Thus, contrary to the Point Blue assertions and based on well established principles derived from peer reviewed literature, *including baling activities under the Draft Protocol would actually enhance the habitats for a number of waterbird species*. (*See* Exhibit B for an in depth discussion on this point).

We also recognize ARB's concern over habitat loss due to the potential for no flooding of post harvest rice fields that have been baled. We concur that if baling were included as an eligible activity and a substantial number of rice fields shifted from flooding to no flooding, that could have a negative impact on certain waterbirds. Accordingly, we propose herein that baling be included as an eligible activity under the Draft Protocol provided that each project demonstrates that its baled field was also flooded post harvest in accordance with the California State Office of the USDA's Natural Resources Conservation Service program entitled Wetland Wildlife Habitat Conservation Practice 644 (USDA's Practice 644 Procedure) (attached as Exhibit C). By making the post harvest flooding of baled fields in accordance with a well established procedure part of the eligibility criteria, it completely removes ARB's stated primary concern over habitat loss. Moreover, as Ms. Klug's Report (Exhibit B) shows, increased baling with flooding would improve the habitat for a large number of waterbird species and have no significant impact for CEQA purposes. (CW1)

Comment: Waiting for additional information on bailing rice straw residue as a project activity is wise. What would the destination of the straw be? What are the repercussions to SOC when crop residues are gleaned from rice fields? However, we urge active research to resolve the issue, and include baling as an activity if studies demonstrate no adverse environmental effects. (ESI1)

Comment: We believe that bailing could be readily included into the protocol without causing a significant impact on the water fowl that rely on winter flooded fields for migratory habitats. We are submitting today a more detailed ecological and environmental analysis that has been previously shared with ARB staff. And we

understand the time and considerations limited their ability to fully evaluate these recommendations. (CW1)

Comment: As you know, Climate Wedge has been actively involved in the compliance protocol development process from the beginning. We strongly believe that including baling in the Protocol would: (i) materially improve its greenhouse gas benefits; (ii) make it easier to scale for purposes of attracting private sector investment; (iii) enhance the habitat for a number of water-bird species and result in no significant impact under CEQA; and (iv) result in a more sustainable utilization of scarce water resources in California.

We applaud ARB's continuing leadership with the adoption of an agricultural sector Protocol. But, adopting the Protocol without the inclusion of baling as an eligible activity significantly hampers its ability to provide substantial reductions in methane emissions from the rice cultivation sector. Methane (CH4) emissions contribute to background ozone in the lower atmosphere (troposphere), which itself is a powerful greenhouse gas and contributes to ground level air pollution . The atmospheric concentration of methane is growing, and reducing the emissions of methane from agriculture is one of the key strategies in CARB's recently released Short-Lived Climate Pollutant Concept Paper, as well as in the initiatives of federal and international greenhouse gas regulations.

Tracking down the answer to the questions that prevented baling from inclusion this time around and revisiting the protocol on the shortest possible timeframe should be an ARB goal. A revised and robust Protocol would truly be a model for others to follow, in particular in the large rice growing regions of Asia and worldwide. Without baling, we have serious reservations that the Protocol will be successful in achieving any of the goals outlined before the Board last December. As proposed the Protocol foregoes potential significant in-State greenhouse gas emission reductions which could help reduce compliance costs, and is therefore not likely to attract meaningful investment from the private sector based on the smaller emission reductions achievable merely through dry rice seeding and/or early drainage activities alone. In addition, it misses a real opportunity to make an important contribution in reducing water consumption throughout the state as we work our way through a fourth straight year of drought.

ARB has stated a concern about the potential impacts to migratory water-birds that currently rely on winter flooding of rice fields for certain habitat needs. We believe that a committed and detailed further review of this issue will show the increased benefits in habitat diversity, as well as other environmental benefits, for a broad range of water-birds and their ecosystems. Climate Wedge appreciates ARB's acknowledgement that additional information should be received and analyzed, and that ARB should not only review currently available research and literature, but to actively pursue its own investigations. Getting the data needed to comfortably make this determination is a publicly stated goal of ARB Board members.

This is a complicated issue no doubt. But we believe it is possible to show positive impacts of baling on both water usage and bird habitat while maintaining current crop yields. These were the original standards ARB stated needed to be met. Taking a holistic view is really key here.

Our ongoing discussions of this issue have been appreciated and have continued to move in a forward, positive direction. One aspect of those discussions has been ARB's openness to committing to continue to work on this issue such that when the Cap and Trade Regulation is again open for amendments, that all the environmental review work would be done. To assist in that effort, Climate Wedge respectfully is including draft Resolution language to be used when this Protocol is finally approved later this summer.

NOW, THEREFORE, BE IT RESOLVED that the Board directs the Executive Officer to take the following actions before December 31, 2016:

1. Evaluate whether there are potential environmental impacts, including potential benefits, to including post-harvest rice straw removal activities into the Rice Cultivation Compliance Offset Protocol;
2. Evaluate feasible alternatives or mitigation measures that could be implemented to reduce or eliminate any potential adverse impacts of baling, while at the same time maximizing the GHG reduction potential of the Protocol; and
3. Present any modifications of the Protocol to the Board for further consideration.

Climate Wedge remains committed to improving the viability of this Protocol, even after it is adopted later this year. Please do not hesitate to contact us moving forward. We look forward to the next steps in this continuing process. (BM1)

Comment:
Expand Eligible Project Activities: IETA welcomes the inclusion of dry seeding, early drainage, and alternative wet/dry cultivation practices as eligible project activities. However, looking ahead, we **encourage ARB to also include post-harvest rice straw and residue removal (i.e., "baling") as an eligible project activity in the Rice Protocol**. Post-harvest rice straw removal inherently eliminates potent methane emissions from the cultivation process by removing biomass from rice fields prior to flooding during the start of the next cultivation cycle. Baling is among the largest opportunities for greenhouse reductions from the rice sector precisely because it removes the underlying source of methane emissions in the first place. Monetizing eligible reductions from baling practices would also curb water demand – and associated carbon emissions – from water usage at a time when California's undergoing historical drought conditions. (IETA1)

> **Response:** The Rice Protocol was developed to both protect the environment and maximize eligible GHG reductions. As a result, certain activities were either included or excluded from the protocol. Baling is not included. Not including an eligible project activity in the Rice Protocol would not result in an environmental impact because it would result in a continuation of the existing environmental setting. The comments above do not raise any significant environmental issues associated with the proposed protocols, or the adequacy of the environmental analyses; however, in the interest of providing information, ARB has provided the following response.
>
> During the development of the protocol, ARB staff explored the environmental impact of including rice straw removal after harvest (baling) as an eligible project activity. While not conclusive, the evidence indicated potential impacts to waterbird species as a result of allowing baling under the protocol. Out of an abundance of caution ARB elected to exclude baling as an eligible practice until such time as sufficient evidence is developed to demonstrate that no significant impact to waterbirds would result from the inclusion of

baling. ARB is committed to working with stakeholders to review new information as it becomes available.

Under CEQA Guidelines (14 CCR 15204(b)), reviewers should focus on the finding that the project will not result in any significant adverse impacts on the environment. In accordance with ARB's certified regulatory program (17 CCR 60007(a)) and the CEQA Guidelines, no revision or further written response is required in response to this comment.

Methane Global Warming Potential

Comment: The Compliance Offsets Protocol - Rice Cultivation Projects currently relies upon a Methane GWP of 21, referenced through Table A-1, p 52 of the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions.

The use of such a Methane GWP Coefficient does not accord with the latest IPCC Methane GWP coefficients, which are 28 and 34 for a 100 year interval and 84 and 86 for a 20 year interval. Use of the Methane GWP 21 grossly underestimates the global warming impact of methane, and any cap and trade program needs to update the methane GWP expeditiously to be legally and ethically tenable. I do not see an intent to "update expeditiously" expressed in the document I have reviewed today.

I am pasting a long chunk of text from Robert Howarth's seminal 2014 publication as support for my claims above. It includes some material about natural gas as a fuel but then moves forcefully into reasons for why shorter time frames and higher methane GWPs should be considered, and used, in assessing methane's impact upon our already rapidly-warming planet.

To conclude, I urge the CARB to address seriously the current artificial deflation of methane GWP coefficients and methane global warming impact that is currently reflected in this rule making process for rice cultivation (PI2)

Comment: California Cap on Greenhouse Gas Emissions and Market-Based Compliance Mechanisms for Methane will establish a regulation that has fixed the methane GWP at 21, which conflicts with the best available science.

The Compliance Offsets Protocol - Rice Cultivation Projects uses a Methane GWP of 21, referenced through Table A-1, p 52 of the Regulation for the Mandatory Reporting of Greenhouse Gas Emissions.

The use of such a Methane GWP Coefficient is not in accord with the latest IPCC Methane GWP coefficients, which are 28 and 34 for a 100 year interval and 84 and 86 for a 20 year interval. Use of the Methane GWP 21 grossly underestimates the global warming impact of methane, and any cap and trade program needs to update the methane GWP expeditiously to be legally and ethically tenable. An intent to update expeditiously this methane GWP is not expressed in the document.

Pasted below as Exhibit A is a long segment of text from Robert Howarth's seminal 2014 publication (attached) as support for my claims above. It includes some language about natural gas as a fuel but then moves into reasons for why shorter time frames and higher methane GWPs should be considered in assessing methane's impact upon climate change.

To conclude, I urge the CARB to address seriously the current artificial deflation of methane GWP coefficients and methane global warming impact that is currently reflected in this rule making process for rice cultivation. (SF1)

> **Response:** This comment does not raise any significant environmental issues associated with the proposed protocols, or the adequacy of the environmental analyses; however, in the interest of providing information, ARB has provided the following response.
>
> The use of 21 as the Global Warming Potential (GWP) for methane is consistent with the methane GWP used to set the cap and calculate GHG emissions under the Regulation. It is critical that the same GWPs be used for setting the cap as well as calculating emissions and emission reductions to have consistency throughout the program.
>
> Under CEQA Guidelines (14 CCR 15204), reviewers should focus on the sufficiency of the environmental document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects

of the project might be avoided or mitigated. In accordance with ARB's certified regulatory program (17 CCR 60007(a)) and the CEQA Guidelines (See 14 CCR 15088), no revision or further written response is required in response to this comment.

Dry Seeding

Comment: In our comments following the February 2015 workshop, we enumerated the potential Rice Protocol's potential negative impacts to wildlife, including raptors, shorebirds, seabirds, long-legged waders, geese, ducks and other waterbirds, and some special-status species, including bald eagle, Swainson's hawk, and greater sandhill crane. Many of these threats were identified in the Staff Report, which acknowledged that the Rice Protocol has the potential to negatively impact wildlife. "*Because the proposed project activities would occur during the rice growing season, avian species that use the rice fields for resting, nesting, and feeding during the rice growing season have the highest potential to be affected by changes to the flooding practices.*" Staff Report at 39. In fact, the potential wildlife impacts were found to be problematic to the extent that the Rice Protocol excludes rice farms in the critically important bird habitat in the Butte Sink Wildlife Management Area from participating in the program. "*By excluding this important and sensitive area from any proposed rice cultivation offset project activities, potential adverse effects in this area would be avoided.*" Staff Report at 40.

The threats to wildlife in California seem to be greatest with the Rice Protocol activity known as Dry Seeding, whereby Rice Protocol projects are credited for sowing seed into dry or moist fields rather than the usual practice of sowing in flooded fields. This incentivizes the management decision not to flood the field for a period of seven to ten days in spring when the field would normally be flooded, a time when flooded fields are normally utilized by late migratory bird species and other avian species that rely on flooded rice fields for nesting.

Although the Staff Report concludes that "*because variability in the timing and availability of flooded rice habitat is common, and voluntary compliance responses under the proposed Rice Cultivation Protocol would occur on a limited rather than widespread basis, implementation of these activities would be within the natural*

variability of rice farming and would not cause a significant effect on bird populations," these conclusions are based on a number of assumptions that are not supported by any evidence presented in the Staff Report or supporting documents. Specifically, the Staff Report provides no evidence that variability in the timing and availability of rice habitat is common, and no characterization of that variability, quantitative or otherwise, that could serve a baseline comparison for the impacts of the Rice Protocol.

Nor does the Staff Report consider that the impact of the Rice Protocol--and the Dry Seeding option in particular--is likely to be more problematic in drought years when there is already a reduction in the area of flooded field habitat regionally. In fact, the Dry Seeding option may be particularly attractive to project landowners in precisely those years when water (and, thus, flooded field habitat) is scarce due to drought. In such cases, rather than being "within the natural variability," Dry Seeding would exacerbate a natural decrease in habitat availability.

In addition, the Staff Report provides no evidence that participation in the Rice Protocol will be limited, stating only that "*rice farms implementing the practices would likely constitute a small fraction of existing habitats within the region at any one time.*" While it may be true that the Rice Protocol is unlikely to become an industry-wide practice, wildlife impacts are more likely to occur at the local level, yet the Staff Report includes no consideration of the potential for localized impacts with respect to exceptionally large project areas or participation by multiple adjacent landowners.

Also, the Staff Report asserts that "*Limiting the proposed project activities to the rice growing season would avoid potential impacts to wintering habitat for migratory waterbirds during the non-growing season.*" However, this conclusion seems to depend on the assumption that switching to Dry Seeding has no effect on winter flooding. Although the decision to flood fields in winter is quite possibly independent of participation in the Rice Protocol, the decision to use Dry Seeding could result in management decisions to end the winter flooding (i.e., to drain the field) earlier.

Given the uncertainty of these various assumptions and the possibility for negative impacts to wildlife, we strongly urge ARB to: 1) verify the various assumptions critical to the assessment of the program's impacts on wildlife and wildlife habitat, 2) put in

place measures to guard against localized wildlife impacts from the participation of exceptionally large project areas or multiple adjacent landowners, and 3) make publicly available a map of the cumulative project areas and the reported data on the timing and duration of flooding for each participating project, and solicit public comments regarding the impacts to wildlife. There were no changes in the Proposed 15-day Modifications to the Rice Protocol or the regulation responsive to these concerns.

The Center for Biological Diversity appreciates the attention that ARB has given to the wildlife impacts and the specific measures in the Rice Protocol intended to reduce the negative impacts to wildlife. We would be pleased to work with you to develop measures to check the assumptions identified in the Staff Report, to guard against localized impacts, and to identify wildlife impacts as they occur. (CBD1)

> **Response:** ARB appreciates CBD's comment and offers to work with ARB to address its concerns. As a preliminary matter, ARB notes that this comment was not received during the 45-day public comment period and was not in response to a change in the 15-day version of the protocol. However, in the interest of providing information, ARB has provided the following response.
>
> Commenter has provided no evidence that contradicts the evidence and reasonable determinations made in the Environmental Analysis. ARB stands by the evidence in the Environmental Analysis, and the conclusion that all environmental impacts will be less than significant due to the extensive safeguards ARB has placed in the Rice Protocol. ARB has made its best efforts to uncover and disclose the reasonably foreseeable environmental impacts that may result from the Rice Protocol. The potential impacts identified by CBD are hypothetical and speculative. CEQA does not require an agency to engage in speculation when future actions that may follow from a project are uncertain. (See *Environmental Council of Sacramento v. City of Sacramento* (2006) 142 Cal.App.4th 1018, 1032; 14 CCR 15145.) It is difficult to provide additional supporting data in peer reviewed studies due to the lack of available rice fields practicing the activities proposed in the Rice Protocol. Furthermore, given the variability, uncertainty regarding participation in the program, and the voluntary nature of the program, the Environmental Analysis made a good faith effort to evaluate and disclose the reasonably foreseeable

environmental impacts of this protocol, without engaging in speculation. ARB concludes these foreseeable environmental effects would be less than significant.

Additionally, staff was directed by the Board in Resolution 11-32 to monitor protocol development, which would include any unanticipated environmental impacts, and propose updates as necessary.

As with all offset projects, ARB will make available project location and additional data for program transparency. This will also allow all interested parties to evaluate if any areas of wildlife concern are also implementing an offset project.

Responses to the specific issues raised by the commenter follow.

Variability of Timing
Dry seeding activities will delay flooding during the normal planting season in May, when the vast majority of waterbirds have already departed. Typically, wet seeding practices occur over several weeks during the planting season. Discussions with experts during the environmental review process indicated that it is likely that dry seeding activities would similarly occur over several weeks throughout the California Rice Growing Region, thus maintaining similar flooding variability to current practices. This variability makes it probable that some fields that dry seed will be flooded prior to fields using traditional wet seeding. This variability will limit the impact of dry siding on waterbird habitat. Additionally the rice tail waters from winter drain go to support natural wetlands which can serve as habitat for late migratory birds.

Limited Adoption
The limited adoption assumption is based on the financial analysis provided in the response to the rice water usage comments above showing the rice protocol would not provide a significant financial incentive to switch practices. From conversations with farmers and experts in the field, it may be difficult to convince farmers to change practices given that even a slight drop in revenue from reduced yield would exceed any offset based revenue. Additionally, both the American Carbon Registry (ACR) and the Climate Action Reserve

(CAR) have voluntary rice protocols that have been eligible for registration for over two years with only two projects listed in California (neither have received offset credits). These facts taken together lead to the reasonable assumption that very few California farmers will participate in the program.

Drought Effect
Based on the financial analysis presented for the rice water usage comment, it is unlikely that the protocol would incentivize a significant shift in activities by itself. The decision to dry seed during a drought year due to limited water supply would likely occur with or without the availability of dry seeding as an eligible project activity.

Winter Drain Effect
From staff conversations with experts it is not expected that fields will be drained any earlier in preparation for dry seed versus wet seed activities. Field preparation in both cases is very similar and would be expected to take similar times. If there were any effect it again would be mitigated by the variability in farming practices. Not all dry seed fields will be drained on the same day, just as not all wet seed fields will be drained on the same day.

Increased Waterbird Habitat
The United States Department of Agriculture's Natural Resources Conservation Service (NRCS) created the Waterbird Habitat Enhancement Program (WHEP), to enhance habitat on 100,000 acres of California ricelands. The WHEP program provides incentives for delaying winter draining and increasing nesting habitat in the spring. Combined with the timing variability discussed above this will help ensure a less than significant impact on waterbirds from the Rice Protocol.

Support

Comment:
The Staff have thoroughly investigated wildlife and environmental impacts
The ARB has done a significant amount of work to analyze the potential environmental and habitat impacts that could occur due to implementation of the

Rice Protocol. We appreciate that the protocol only allows project activities during the rice growing season. We are encouraged by the Staff's research that the Early Drainage practice "could serve as a benefit to giant garter snake populations." Also, we are pleased to see that rice cultivation within the Butte Sink Wildlife Management Area will not be eligible to participate, considering the critical importance of that habitat for waterfowl. (EDF1)

Response: ARB staff would like to thank the commenter for their support.

<u>Proposed Update the Compliance Offset protocol U.S. Forest Projects</u>

Forestry Even-Aged Management 40 Acre Limit

Comment: We would also like to reiterate our concern on the current limitation of clearcut size to 40 acres in Section 3.11.4 - *Balancing Age and Habitat Practices*. As we noted in our July 18, 2012 comment on Version 3.3, this arbitrary requirement significantly undermines participation in the CAR Protocol by most landowners due to the fact that this size limitation is inconsistent both with standard environmental mitigation measures and the economics of harvesting in many regions of the United States. Additionally, this restriction has no impact in how carbon in forests is accounted for in forestry operations.

From an environmental perspective, a 40 acre clearcut limitation requires more road use than larger clearcut units. Fewer entries over a period of time will result in less soil disturbance helping to minimize sedimentation to streams and lessen risks of soil compaction.

We recognize that appropriate limits to clearcut size do provide environmental benefits as recognized by the leading certification programs. Presumably this is one of the reasons that CAR's Forest Protocol recognizes participation in forest certification programs. As part of their criteria, these programs all provide reasonable limits on clearcut size based on sound silvicultural and sustainability principles. There is little likelihood of a landowner engaging in the added expense of certification and then compounding that expense with this artificial limit on clearcut size.

In addition, clearcutting as a harvest and regeneration method has sound silvicultural and ecological bases:

- It allows sunlight to reach the ground so newly planted seedlings quickly take root and regenerate the forest. As such, it's the system best suited to commercially important shade-intolerant species, including Douglas-fir in the western United States and loblolly pine in the southern United States. These tree species reach their full growth and yield potential only when grown in full sunlight.
- It provides habitat for animal species, some of which are of high conservation priority, that are associated with early successional plant communities. Some plant species in these communities also are of high priority.
- It results in stands of even-aged trees that produce wood products with more uniform qualities.
- As noted above, it requires fewer roads and entries into the stand than partial harvesting systems, thus reducing the risk of sedimentation in streams.
- It is often more efficient, cost-effective and safer than partial harvesting systems.

Overall, the smaller the allowable clearcut size, the more roads need to be built and the more costly the silvicultural operation becomes. This arbitrary limitation discourages landowner participation, offers no additional environmental benefit, and adds nothing to the proper accounting of carbon stored as part of the protocol. (NAFO1)

Comment: 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. (UCB1)

Clearcutting as a harvest and regeneration method has sound silvicultural and ecological bases:

- It allows sunlight to reach the ground so newly planted seedlings quickly take root and regenerate the forest. As such, it's the system best suited to commercially important shade-intolerant species, including Douglas-fir in the western United States and loblolly pine in the southern United States. These tree species reach their full growth and yield potential only when grown in full sunlight.

- It provides habitat for animal species, some of which are of high conservation priority, that are associated with early successional plant communities. Some plant species in these communities also are of high priority.

- It results in stands of even-aged trees that produce wood products with more uniform qualities.

- It requires fewer roads and entries into the stand than partial harvesting systems, thus reducing the risk of sedimentation in streams.

- It is often more efficient, cost-effective and safer than partial harvesting systems.

We recognize that appropriate limits to clearcut size do provide environmental benefits as recognized by leading certification programs. Presumably this is one of the reasons that the ARB Protocol encourages participation in a forest certification program in section 3.1. As part of their criteria, these programs all provide reasonable limits on clearcut size based on sound silvicultural and sustainability principles. Furthermore, some states also regulate clearcut size based on their own silvicultural realities in their specific states, which are designed to ensure harvest activities will not negatively impact other environmental variables. There is little likelihood of a landowner engaging in the added expense of certification and then

compounding that expense with this artificial limit on clearcut size. This also applies to the green-up requirements, which are addressed above.

Overall, the smaller the allowable clearcut size, the more roads need to be built and the more costly the silvicultural operation becomes. This arbitrary limitation discourages landowner participation, offers no additional environmental benefit, and adds nothing to the proper accounting of carbon stored as part of the protocol. Suggestion: We recommend removing the open canopy harvest requirements by eliminating Section 3.1.A.4.B. Further, we recommend allowing the clearcut size limit to be determined by the specific state forest practice rule, BMP, or certification system that governs the particular project area. (WC1)

Comment: The current Even-aged Management definition is incongruous with accepted silvicultural practices in many areas of the country, where larger scale regeneration cuts are necessary for promoting healthy forest regeneration. As the program is designed to encourage forest participation around the country, promote healthy forests and galvanize support for cap-and-trade expansion in other states, it is counterproductive to enshrine rules that would impede the enrollment of forests outside of California or that are less environmentally beneficial for many forests. (BS1)

Comment: New proposed language guiding even-aged management does not adequately consider the environmental impact of the proposed rules on forestland outside of California. While the intention was to align requirements for even-aged management with those of the California Forest Practice Rules, environmentally sound forest management is not a one-size-fits-all-proposition.

It has been explained to Finite Carbon that the intention of the proposed language is to improve the environmental credibility of the program. However, we believe the Air Resources Board has not adequately considered how this language may provide a financial incentive to harm biodiversity outside the State of California.
Rules concerning forest practices are not like vehicle emissions standards where California is setting a high bar for others to follow. Although the even-aged management language may be the most environmentally beneficial way to manage forests within California, it can have negative impacts if practiced outside of the state. We have identified several ways in which managing a forest under the

proposed language can harm biodiversity if practiced at scale outside of California where 17 of our 19 projects on approximately 800,000 acres are located.

To be clear, we are not challenging language from the existing protocol which prohibits clear cuts larger than 40 acres. We are specifically addressing the current language which limits the extent of the practices of seed tree and shelter wood management which are sanctioned under widely respected certification programs such as Forest Stewardship Council (FSC).

Management situations where the proposed management restrictions may harm biodiversity:

- 40 acre or less regeneration cuts that are in areas of high undulate populations frequently fail due to over browsing. This includes most states east of the Mississippi, especially areas in New England, the lakes states, and Appalachia. Small unit harvests allow a relatively small local population to eradicate regenerating trees while larger regeneration harvests of more than 40 acres provide adequate food for local undulate populations and significantly increase the odds of tree survival. Limited regeneration cuts can lead to high browsing pressure on particular species and artificially alter the structure of forests. In several studies in the lake states, hemlock, white cedar, red oak, and yellow birch were found to be especially susceptible to this issue.
- 40 acre regeneration cuts with 50 square feet of basal area retention may artificially alter future species composition in a stand due to shade and competition. A cut with high basal area retention in Allegheny hardwoods may come back to birch, beech, and striped maple instead of cherry and red maple due to shade and browse combined.
- Stands with a high density of a single species like beech can be far more prone to being decimated by disease than a diversified stand. This is not good for biodiversity or climate change. Furthermore, climate change can exacerbate the spread of disease – a climate change mitigation effort by California should not be allowed to contribute to the same issue.
- Many species need larger areas of early successional habitat and may be discriminated against due to the small and fragmented nature of the cut size and buffer requirement. Canada Lynx, neotropical songbirds, Moose, and other species would all be impacted by limiting regeneration size. Carbon

projects can cover significant areas of a single species' habitat and rules developed by California can have landscape scale impacts. Carbon projects developed for California already cover more than 4% of New Hampshire, one of only 6 states Eastern Moose inhabit. (FCC2)

Response: The size limits placed on even-aged management have remained unchanged since the U.S. Forest Projects Compliance Offset Protocol (Forest Protocol) was originally adopted by the Board in October of 2011 and are not proposed for change in these amendments. The 40 acre limit on even-aged management was not limited to clearcutting but would also include other even aged management techniques such as seed tree and shelter wood even-aged management techniques. Therefore the 40 acre limit in the original protocol adopted in October of 2011 would not have allowed seed tree or shelter wood cuts in excess of 40 acres. No environmental comments on the 40 acre limit were raised when the Forest Protocol was released for comment prior to adoption in October 2011. These comments are outside the scope of the regulatory revisions presented here. However in the interest of providing information, ARB has provided the following response.

ARB selected the California Forest Practice Rules as an appropriate standard because the existing even-aged management requirements in the Forest Protocol adopted by the Board in 2011 were based on the California Forest Practice Rules. One of the goals of the compliance offset program is to encourage the spread of California's high sustainability standards to other states. The compliance offset program is a voluntary program in which entities choose to participate. The implementation of the program requires equitable standards that can be applied equally across all states. The California Forest Practice Rules is the basis for these equitable standards regarding even-aged management.

To the extent feasible, the protocol includes environmental safeguards to help assure the environmental integrity of forest offset projects, which include: requirements for projects to demonstrate sustainable long-term harvesting practices; limits on the size and location of even-aged management practices; and requirements for natural forest management. All projects are required to

use management practices that promote and maintain native forests comprised of multiple ages and mixed native species at multiple landscape scales. Participating in the Forest Protocol must result in environmental benefits.

In areas where even-aged management practices in excess of 40 acres are allowed, participation in the protocol may cause additional smaller plots to be even-aged managed. However, overall, projects must have a net increase in carbon sequestration which will likely result from reduced harvest frequency and intensity, which will result in similar or reduced impact on soil and water. It is likely that as a result of the protocol there will be less harvest activity. Therefore, as stated in the 2010 Functional Equivalent Document prepared for the California Cap on GHG Emissions and Market Based Compliance Mechanisms (2010 FED), forest projects would occur on land that currently supports or historically supported forests. Soil erosion or loss of topsoil, and unstable soil conditions would be present under existing conditions because land proposed for a forest project would already be expected to support or previously supported forest management and/or timber harvest activities of some type, based on land ownership and market conditions. Therefore, the proposed updated Forest Protocol would not significantly impact soil resources and water resources.

As identified in the October 2011 Final Statement of Reasons for California's Cap-and-Trade Program, ARB could not find any definitive evidence as to whether even-age stands are more prone to fire risk than uneven-age stands, and the Forest Protocol requires all forest projects to contribute a percentage of their offset credits to a forest buffer account that will be used to compensate for any unintentional reversals of stored carbon due to fire. Additionally, the 2010 FED and the 2014 Staff Report identified the regulatory setting, setting forth the requirements for forest projects to implement appropriate emergency response/evacuation plans and wildfire risk reduction plans.

Only even aged-management techniques are limited to 40 acres. Uneven-aged management, variable retention and other techniques for improving the forest health may be used in areas in excess of 40 acres.

There is no requirement in the Forest Protocol to retain 50 square feet of basal area in a regeneration cut. Projects may go significantly below 50 square feet basal area. This will allow a harvested plot to maintain its species composition. However, an adjacent plot may not be even-aged managed until the 150 point count or 50 square foot basal area requirement has been met.

There is also no requirement for a plot to cater to a single species, such as beech as the commenter suggests. In fact, the exact opposite is required. All projects must promote and maintain a diversity of native species within the project area. A project would be ineligible if any one species makes-up more than a specific percentage required by the protocol.

Even-aged management causes changes to ecosystems, bringing in new and different flora and fauna than previously existed. Therefore, placing limits on even-aged management maintains and enhances the existing natural species, rather than facilitating a change in species composition through larger size cuts. This would not have an environmental impact because these new species currently do not exist in the stand prior to even-aged management.

As with all offset projects, ARB will make available project location and additional data for program transparency. This will also allow all interested parties to evaluate if any areas of wildlife concern are also implementing an offset project.

Forestry Even-Aged Management Buffer and Minimum Retention Requirements

Comment: 1. Modification to Even-age management eligibility requirements (3.1(a)(4)(A) – (C))

Requiring a buffer that meets the proposed size requirements at the time of project commencement around each ‘open canopy’ unit is not aligned with commonly implemented forest management practices and silvicultural techniques in the United

States. This requirement also differs significantly from what sustainable forest certification programs including Forest Stewardship Council (FSC), Sustainable Forestry Initiative (SFI) and American Tree Farm (ATF) require in terms of post-harvest adjacency and retention. This proposed language would exclude the majority of forest owners practicing even-aged management systems, including clear-cutting, seed tree and shelter-wood systems. A 20 acre even-aged harvest unit would require a buffer of approximately 127 acres and for a 40 acre even-aged harvest the required buffer area would be approximately 429 acres. It is not economical or ecologically sound to keep such a large area of land effectively out of management after each 'open canopy' harvest. In addition, the changes in silvicultural planning to conform to the proposed buffer and retention requirement, especially in areas where timber prices and log quality are low, would be financially impossible.

Further, maintaining 50 square feet retention in the buffer would be both ecologically detrimental and economically infeasible for most forest land owners in the United States. Requiring maintenance of such a high retention level would, for example, result in a forest manager's inability to conduct preparatory shelterwood cuts to allow for regeneration of the understory. Without this release, the forest age structure would be negatively impacted, and could have deleterious effects on important habitats as well as overall forest health. Maintaining such a high retention across such vast areas could also negatively impact wildlife species that require early successional forest habitat, or species that require large areas for browsing. (ACR1)

Comment: Section 3.1.A.4.B.

> One significant benefit of even-aged management is the harvests provide large areas of early successional habitat for wildlife, particularly songbirds. Tubbs et al. provides basal area retention guidelines far below what the ARB prescribes. Retention of the proposed language will discourage even-age management and have an adverse effect on songbird habitat, overall biodiversity, and the "natural forest management" criteria in the protocol. (SIG1)

Comment: General Eligibility Requirements Page 18(a)(4)(A) and (a)(4)(B): ARB has proposed language which requires extraordinary buffers around open canopy harvests:

(4) If harvesting occurs within the project area, meet the following harvest unit size and buffer area requirements:

(A) Harvest units that have less than 50 square feet of basal area retention must not exceed 40 acres in total area;

(B) Open canopy harvest units, harvest units with an area of 3 acres or greater that have less than 50 square feet of basal area retention, must have a buffer area of forest vegetation containing at least 50 square feet of basal area retention must surround the harvest unit. 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

(C) Cuts on harvest units that occurred prior to the project commencement date are exempt from subchapters 3.1(a)(4)(A) and 3.1(a)(4)(B) provided that no new harvests occur in the previously cut harvest unit or would be buffer area until the harvest unit cut prior to project commencement meets the requirements of subchapter 3.1(a)(4)(A) and
3.1(a)(4)(B);

The proposed language is potentially problematic in that it would require one even aged management buffer approach to be applied in all forest types, situations, topographies, and ownership types across the US in order to protect visual impacts and maintain wildlife habitat values. We believe the management of forests across the country using one approach will not be effective to meet the intent of the proposed protocol change without significant negative impacts. The US has a wide variety of forests for which this proposed language is not a “one size fits all” solution.

It is our position that the implementation of the proposed requirement has a host of potentially negative unintended consequences including:

1. If a forest owner were to conduct a 40 acre open canopy harvest under the proposed language, the buffer policy (1600 linear feet around the harvest) would take 429 acres (see Figure 1) out of the harvest plans for similar even aged harvests for extended periods of time on a project area. For example, in the Allegheny region of Pennsylvania where natural regeneration techniques are used, regeneration

harvests may not reach the minimum target stocking level for 20 years or more. Private landowners cannot bear the economic impact of the proposed level of harvest restriction over their ownership tenure. Nor is the proposed buffer policy in alignment with Forest Stewardship Council and other certification requirements which were developed over years by diverse stakeholder groups for use throughout the United States.

2. The minimum retention of 50 square feet of basal area in the area surrounding a 40 acre cut could translate into unsustainable management for the forest surrounding the target harvest block. Every forest has a mix of species with unique silvicultural requirements, which if not met through management, can be negatively impacted for years into the future. Forcing all landowners to follow one prescriptive approach regardless of their forests' unique requirements can translate to mismanagement at worst, and undesired changes in species composition at the least. The policy needs to recognize and provide latitude for the appropriate treatment of each landowner's forest.

3. The proposed harvest restrictions do not recognize the geographic and topographic differences amongst regions of the country. For example, while the new policy would undoubtedly mitigate visual impacts of harvests in steep mountainous terrain, it would have little to no perceptible positive impact on that forest value where the topography is gently sloping to flat. This translates to a visual management restriction that limits a forest owner's management operations with no perceptible benefit to the ARB program.

4. Wildlife habitat requirements for early successional habitat vary widely across the country. Species such as the Canada Lynx require larger early successional habitats than 40 acres, ruffed grouse management in the lakes States require overstory retention levels below 50 square feet of basal area, many small mammals in the eastern US require larger than 40 acre home ranges in early successional habitat, and many Neotropical birds also require larger young forests. These are just some examples of how one countrywide set of criteria will not meet all intended objectives of this portion of the ARB program.

5. The proposed regulation could reduce the tools available to forest owners to practice sustainable forestry. For instance, in areas where ungulate (deer and elk)

populations are high, small cuts isolated in the landscape can, and often do, fail to regenerate due to browse pressure. Regeneration failures are expensive and can create compliance and conformance issues with current forestry regulations in many programs across the country including ARB's proposed buffer and green up requirements. Landowners faced with these challenges often create aggregates of small cuts in a geography to overwhelm localized ungulate populations, allowing the regeneration to thrive. The proposed regulation would preclude the use of this valuable solution to a prevalent problem with forest sustainability. (FCC1)

Comment: Proposed Buffer Width and Buffer Retention Changes in Section 3.1(a)(4)(A and B)

Landowners across the U.S., including industrial landowners in California, that practice even-age management would likely be precluded from registering their forest carbon using the ARB Compliance Offset Protocol (U.S. Forest Projects) if the proposed changes are adopted by ARB.

The proposed change goes well beyond the California Forest Practices Act implementing regulations. For even-age management they call for adjacent harvest units to be of equal size and a minimum 300' distance between harvest units. These constraints must be retained from 3-5 years. The Protocol change proposes, for a 20 acre harvest unit, an 800' buffer to be retained until the plantation has 50 square feet of basal area about 15-25 years of growth. This would drastically change any even-age managed forest's sustained yield plan, require a major amendment to the currently approved 100-year plan and dramatically lower first and second decade harvest levels. No demonstrated need or justification has been provided for this drastic change.

We can provide documentation that for even-aged managed forests a carbon sequestration calculation would show that adoption of this proposed buffer width and buffer retention change would lower sequestered carbon over a 100-year time horizon. This outcome is detrimental and contrary to ARB's stated goals for the forest offset program. The current State Forest Practices Act and the existing US Protocol already provides for significant environmental protection. Under the Public Resources Code, the Resources Agency and more specifically the Board of Forestry

are designated the authority to promulgate Forest Practice Act regulations. This proposed change is clearly under their purview and not under that of ARB.

As is usually the outcome of an un-necessary proposal, is that there is almost always unintended consequences. This proposed rule would prevent landowners from successfully providing future habitat to sustainably provide nesting and denning stands for species like the northern goshawk, fisher, California and northern spotted owls. (SPI1)

> **Response:** While there was no intent to place additional requirements on the even-aged management buffer, only to clarify the existing language to provide criteria for the project operator and the verifier to meet, staff acknowledges these modifications have caused some confusion. The buffer area calculation was meant to be a simplification of the California Forest Practice Rule. ARB selected the California Forest Practice Rules as an appropriate standard because the existing even-aged management requirements in the Forest Protocol adopted by the Board in 2011 were based on the California Forest Practice Rules. One of the goals of the compliance offset program is to encourage the spread of California's high sustainability standards to other states. The compliance offset program is a voluntary program in which entities choose to participate. The implementation of the program requires equitable standards that can be applied equally across all states. The California Forest Practice Rules is the basis for these equitable standards regarding even-aged management.
>
> To the extent feasible, the protocol includes environmental safeguards to help assure the environmental integrity of Forest Offset Projects, which include: requirements for projects to demonstrate sustainable long-term harvesting practices; limits on the size and location of even-aged management practices; and requirements for natural forest management. All projects are required to use management practices that promote and maintain native forests comprised of multiple ages and mixed native species at multiple landscape scales. ARB agrees that a strict reading of the buffer requirement would create unreasonably large buffer areas and has made appropriate modifications to reduce the buffer size to be consistent with the California Forest Practice Rules buffer requirements. The 50 square foot basal area

was taken directly from section 912.7 of the California Forest Practice Rules regarding stocking levels. To address these comments and the confusion, staff has provided amendments to these sections to more precisely follow the California Forest Practice Rules.

Even-aged management causes changes to ecosystems, bringing in new and different flora and fauna than previously existed. Therefore, placing limits on even-aged management maintains and enhances the existing natural species, rather than facilitating a change in species composition through larger size cuts. This would not have an environmental impact because these new species currently do not exist in the stand prior to even-aged management.

As stated in the 2010 FED, timber harvests and/or forest management activities are expected to take place on project sites for reasons that are independent of the Forest Protocol, i.e., the sites contain existing or formerly managed forest, because of their property ownership, land use, and/or location, along with market demands for wood products. Consequently, silviculture activities would occur with or without the inclusion of the protocol in the offset program, so a substantial adverse environmental change resulting from forest offset project activities would not be expected.

However, as explained in the 2014 Staff Report, the possibility cannot be ruled out that a special-status species or its habitat could be adversely affected by project activities, recognizing the changes in habitat expected from the reforestation projects. Therefore, although the risk of adverse impact to special-status species and their sensitive habitats is small, it cannot be eliminated. Furthermore, special-status species and their sensitive habitats deserve extra care in their protection, because of their scarcity and importance. Therefore, a conservative interpretation (i.e., seeking to avoid a risk of understating impacts) would warrant a conclusion that impacts to special-status species and their sensitive habitats are considered to be potentially significant.

All forest projects are expected to include periodic forest management activities, such as thinning to increase resistance to wildfire, insect or disease

risks, or to balance age classes, and timber harvests. The requirement of the Forest Protocol to use sustainable long-term harvesting practices and natural forest management would minimize potential impacts to biological resources over the long-term by broadening the goal of increased carbon sequestration to include goals of managing for diversity of native species, multiple forest age classes to support functioning habitat, and complexity of forest structure. However, short-term impacts to biological resources, such as temporary loss of foraging, nesting, sheltering habitat for special-status wildlife or fill or degradation of wetlands, creeks, or other aquatic habitat, could occur during timber harvesting or other forest management activities.

Forest projects would occur on land that is currently timber land and could be subject to forest management and periodic timber harvesting under existing market conditions, or was formerly subject to forest management and/or timber harvesting. Timber harvests and/or forest management activities are expected to take place on project sites for reasons that are independent of the Forest Protocol, i.e., the sites contain existing or formerly managed forest, because of their property ownership, land use, and/or location, along with market demands for wood products. Compared to existing timber harvesting and forest management activities on a project site, implementation of the Forest Protocol would not be expected to result in substantial adverse environmental changes related to forest projects under the Forest Protocol are not expected to interfere substantially with native wildlife or fish movement or impede the use of movement corridors or nursery sites. Forest projects are required by the protocol to use sustainable long-term harvesting practices and natural forest management, which, in general, would promote principles of biodiversity.

Existing conservation plans adopted to comply with the Endangered Species Act or similar state laws establish legal constraints for forest management and timber harvest that must be similarly carried out with or without an offset project. Therefore, impacts to wildlife or fish movement, corridors, or nursery sites, and local policies and conservation plans, are considered less than significant.

As with all offset projects, ARB will make available project location and additional data for program transparency. This will also allow all interested parties to evaluate if any areas of wildlife concern are also implementing an offset project.

Comment; The proposed requirements for projects that use even-aged silviculture impose requirements that will eliminate incentives for improved management with increased carbon stocks across broad acreages where actions might otherwise be taken with clear climate benefits. ACR believes these requirements should only apply to even-aged regeneration harvests, which remove the pre-harvest existing stand. All other even-aged harvesting should be exempt from this requirement. We believe the proposed threshold of 50 square feet/acre is unnecessarily high, and will disqualify many even-aged systems, including systems with clear climate benefits that keep residual retention above 25 square feet after all harvest steps. (ACR2)

Response: If the high standards of the Forest Protocol prevent a project from participating, as the commenter claims, this would not result in an environmental impact because it would result in a continuation of the existing environmental setting. Therefore, the comments above do not raise any significant environmental issues associated with the proposed protocols, or the adequacy of the environmental analyses.

Under CEQA Guidelines (14 CCR 15204), reviewers should focus on the sufficiency of the environmental document in identifying and analyzing the possible impacts on the environment and ways in which the proposed project's significant effects might be avoided or mitigated. In accordance with ARB's certified regulatory program (17 CCR 60007(a)) and the CEQA Guidelines (See 14 CCR 15088), no revision or further written response is required in response to this comment.

Open Canopy Harvest Unit

Comment: Page 6 Definition 36 – "Open Canopy Harvest Unit": The definition of open canopy harvest unit as "a harvest unit with an area of 3 acres or greater that

has less than 50 square feet of basal area retention" does not provide adequate protection for forest health and environmental concerns. Furthermore, it is not an appropriate standard for forest management in the eastern portion of the United States. (FCC1)

Response: This comment does not raise any significant environmental issues associated with the proposed protocols, or the adequacy of the environmental analyses; however, in the interest of providing information, ARB has provided the following response.

The definition of Open Canopy Harvest Unit is part of the even-aged management requirements. While there was no intent to change even-aged management requirements, only to clarify the existing language to provide criteria for the project operator and the verifier to meet, staff acknowledges these modifications have caused some confusion. The 50 square foot basal area was taken directly from section 912.7 of the California Forest Practice Rules regarding stocking levels. To address these comments and the confusion staff has provided amendments to these sections to more precisely follow the California Forest Practice Rules.

ARB selected the California Forest Practice Rules as an appropriate standard because the existing even-aged management requirements in the Forest Protocol adopted by the Board in 2011 were based on the California Forest Practice Rules. One of the goals of the compliance offset program is to encourage the spread of California's high sustainability standards to other states. The compliance offset program is a voluntary program in which entities choose to participate. The implementation of the program requires equitable standards that can be applied equally across all states. The California Forest Practice Rules is the basis for these equitable standards regarding even-aged management.

To the extent feasible, the protocol includes environmental safeguards to help assure the environmental integrity of forest offset projects, which include: requirements for projects to demonstrate sustainable long-term harvesting practices; limits on the size and location of even-aged management practices; and requirements for natural forest management. All projects are required to

use management practices that promote and maintain native forests comprised of multiple ages and mixed native species at multiple landscape scales. The protocol is therefore designed to ensure that projects will result in environmental benefits.

Under CEQA Guidelines (14 CCR15204), reviewers should focus on the sufficiency of the environmental document in identifying and analyzing the possible impacts on the environment and ways in which the proposed project's significant effects might be avoided or mitigated. In accordance with ARB's certified regulatory program (17 CCR 60007(a)) and the CEQA Guidelines (See 14 CCR 15088), no revision or further written response is required in response to this comment.

Forestry Logical Management Unit and Minimum Baseline Level

Comment: ARB has proposed a requirement to calculate weighted average above ground standing live tree carbon in the logical management unit of the proposed project if Initial Carbon Stocks are above Common Practice.

This requirement is a barrier to large landowners placing portions of their property into a carbon project in order to protect old growth and other well stocked stands. It was not included in the original version of the protocol and will have a negative impact on utilizing carbon as a conservation tool for subsections of a large property.

These conservation minded projects require landowners to maintain the beginning carbon stocks of stands which are above common practice which are the most at risk for harvest due to their commercial value.

Implementing a project on lands where the determination of a Logical Management Unit is required is a high risk proposition for a landowner because the definition of LMU leaves significant discretion to verifiers and the Air Resource Board in practice. Therefore, landowners must expend significant capital in order for a few individuals to ultimately make an interpretive decision of the appropriateness of the proposed LMU.

Carbon can make a significant difference in the way small ecologically sensitive areas of land within a larger holding are managed. As an example: Carbon rarely competes with the value of timber; however, in riparian areas where logging is more expensive, creating value through the growth of stands allows carbon to be a viable revenue source and will increase the length of rotation for these areas, thereby reducing erosion and negative impacts on water quality and aquatic habitat.

Finite Carbon recommends that Equation 5.5 not be modified. Project scenarios where this proposed modification will be an obstacle include: protecting view sheds; old growth stands or stands with legacy old growth; well stocked stands; riparian areas; endangered species habitat such as spotted owl, marbled murelett, and fishers; areas with unique soil composition and plant habitat; and culturally sensitive areas. (FCC1)

Comment: The other major area of concern is the requirement to evaluate carbon stocks across a broader Logical Management Unit when determining a project's baseline scenario (specific language below):

Equation 5.5. Determining the Minimum Baseline Level Where Initial Carbon Stocks Are Above Common Practice MBL = MAX(CP, MIN(ICS, CP + ICS - WCS))
Where,
MAX = The highest value in the set of values being evaluated
MIN = The lowest value in the set of values being evaluated
MBL = Minimum baseline level for above-ground standing live tree carbon stocks (MT CO2e/acre)
CP = Common Practice (MT CO2e/acre)
ICS = Initial above-ground standing live tree carbon stocks per acre within the project area (MT CO2e/acre)
WCS = The weighted average above-ground standing live tree carbon stocks per acre within the LMU containing the project area (MT CO2e/acre)

The purpose of this language is to prevent landowners from potentially creating a net negative impact on the climate by decreasing carbon storage on one area of managed forestlands, while increasing the carbon stored on another portion of their forested lands. While this is a worthy goal, this protocol revision may not achieve it,

and it may drastically limit the number of landowners and categories of landowners that will be interested in participating in the program. (OCSEES1)

Comment: The new method for determining minimum baseline level (MBL) for IFM projects with initial carbon stocking (ICS) above common practice (CP) will run counter to the program's climate goals. If a landowner is forced to use a MBL above CP, due to lower stocking levels on other holdings in the same assessment area, a carbon project may not be feasible. This approach disincentivizes landowners from establishing forest projects on their most highly stocked (and likely to be harvested) acres and thereby forgoes the meaningful climate benefits that would have been associated with preventing aggressive harvesting on these acres for the next 100+ years. (BS1)

> **Response:** If the high standards of the Forest Protocol prevent a project from participating, as the commenters claim or imply, this would not result in an environmental impact because it would result in a continuation of the existing environmental setting. The only impact the enhance Minimum Bassline Level requirements would have is reducing the number of ARB offset credits a project is eligible to receive. This may reduce the incentive for forest areas to participate, but it does not cause an environmental impact. Therefore, the comments above do not raise any significant environmental issues associated with the proposed protocols, or the adequacy of the environmental analyses; however, in the interest of providing information, ARB has provided the following response.
>
> Staff agrees that the proposed modifications could unintentionally exclude desired project areas. We have made additional modifications to the definition of Logical Management Unit to allow projects on areas that have experienced natural disturbance such as wildfire or windstorm, and areas designated as High Conservation Value Forest.
>
> Under CEQA Guidelines (14 CCR 15204), reviewers should focus on the sufficiency of the environmental document in identifying and analyzing the possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated. In accordance with ARB's certified regulatory program (17 CCR 60007(a)) and the CEQA Guidelines

(See 14 CCR 15088), no revision or further written response is required in response to this comment.

Comment: The minimum baseline level equations are not scientifically justified and will have the consequence of ignoring one of the most efficient and effective methods for reducing GHG emissions, i.e. maintaining high-stocked mature forests. The protocol already has mechanisms in place to prevent issuing offsets to highly stocked mature forests that exist because of weak or absent timber markets, i.e. baselines must incorporate all legal constraints and financial considerations - 5.2.1(e)(1) & (2). In the same respect, forests that were heavily harvested immediately before considering participation will not be feasible as an offset project because of how the baseline is set, and the high stocking reference analysis. (FCC2)

Comment: For instance, changes to the establishment of the minimum baseline level for Improved Forest Management projects in Chapter 5.2.1(d)(1) will prevent the appropriate inclusion of forests with above average carbon stocks from being conserved, leaving them available for business-as-usual timber harvest. It was and is the intent of the Forest Protocol to protect these carbon rich forest stands, which, if logged or converted would lead to significant emissions as well as loss of important co-benefits, including habitat for rare and threatened species. (PFT1)

Response: If the high standards of the Forest Protocol prevent a project from participating, as the commenter implies, this would not result in an environmental impact because it would result in a continuation of the existing environmental setting. The only impact the enhance Minimum Bassline Level requirements would have is reducing the number of ARB offset credits a project is eligible to receive. This may reduce the incentive for forest areas to participate, but it does not cause an environmental impact. Therefore, the comments above do not raise any significant environmental issues associated with the proposed protocols, or the adequacy of the environmental analyses; however, in the interest of providing information, ARB has provided the following response.

Under CEQA Guidelines (14 CCR 15204), reviewers should focus on the sufficiency of the environmental document in identifying and analyzing the

possible impacts on the environment and ways in which the significant effects of the project might be avoided or mitigated. In accordance with ARB's certified regulatory program (17 CCR 60007(a)) and the CEQA Guidelines (See 14 CCR 15088), no revision or further written response is required in response to this comment.

Common Practice Values

Comment: Based on the newly incorporated Forest Inventory and Analysis (FIA) data and changes in the way site class is determined, CP values have generally increased in assessment areas.

Implications

- CP values, that do not take into account the temporal dynamics of market conditions and forest stocking, could increase GHG emissions and have potentially unintended consequences on climate change mitigation goals. (SIG1)

Comment: Setting CP values based on forest stocking levels at isolated points in time will lead to less than optimal forest carbon sequestration and reduced climate benefit. This is because when baselines are set artificially high based on periodic market fluctuations, and demand for timber surges, there will be even less incentive for landowners to implement a carbon project and stocks will be harvested instead of locked in for 100+ years. Following such market conditions, many forest carbon projects would not be attractive to landowners again until general stocks had subsided and baseline values were sufficiently lowered to allow for project viability. (BS1)

Comment: By instituting the proposed changes to the CP value, owners of forests with greater carbon stores may no longer have an incentive to conserve them by being able to generate offsets. Rather, it is more likely these owners will avail themselves of the log market instead. (PFT1)

Response: The Forest Protocol only credits reductions in GHG emissions and enhanced sequestration so it is unlikely that any forest area that would

have increased GHG emissions or reduced sequestration as a result of participating in the Forest Protocol would implement a project Only projects that result in GHG emission reduction or enhanced sequestration would have any motivation to participate in the Forest Protocol. The commenters are likely referring to reduced participation in the Forest Protocol because the higher Common Practice values could reduce the number of offset credits a project receives. If the high standards of the Forest Protocol prevent a project from participating, as ARB infers from the comment, this would not result in an environmental impact or increased GHG emissions because it would result in a continuation of the existing environmental setting. Therefore, the comments above do not raise any significant environmental issues associated with the proposed protocols, or the adequacy of the environmental analysis.

Under CEQA Guidelines (14 CCR 15204), reviewers should focus on the sufficiency of the environmental document in identifying and analyzing the possible impacts on the environment and ways in which the proposed project's significant effects might be avoided or mitigated. In accordance with ARB's certified regulatory program (17 CCR 60007(a)) and the CEQA Guidelines (See 14 CCR 15088), no revision or further written response is required in response to this comment.

Impacts of Clearcutting

Comment: When ARB proposed updates to the Forest Protocol in October 2014, the updates included some modest steps toward addressing the impacts of clearcutting in Forest Protocol projects.1 Specifically, the proposed changes included requirements for buffer areas around clearcutting units, and set clear thresholds for stocking level reductions. In February 2015, ARB announced that they were revising their proposal, eliminating even these limited changes.2 The revisions presented at the February workshop instead proposed to apply nationwide some of the minimum legal requirements that apply to clearcutting and other even-age management in California. As this reflects the most damaging and intensive industrial logging practices in California, with all the associated impacts to forest ecosystems and wildlife habitat, this continues to represent a setback for forest conservation standards.

…
In addition, the sentence regarding irregular shape is inadvertently misleading and counterproductive. Forest clearcuts do not mimic natural disturbance, and it is unsupported and highly misleading to imply they can. We know of no scientific basis for asserting that an irregular shape or variation in size in any way mitigates the negative ecological impacts of clearcutting. While a single, smaller clearcut unit on its own damages less forest than a larger one, this assumes the timber operator does not create more clearcut units as a result. Furthermore, the directive "to mimic natural patterns and features found in landscapes" is ambiguous and unenforceable, and there is no basis for this approach. This requirement would need to be defined in quantitative measures to have practical meaning. We strongly recommend eliminating the sentence entirely, or at least removing the implication that forest clearcutting can mimic natural patterns and features.
…
Section 1.2 includes the new term "countable tree" for the purposes of determining stocking levels for regeneration in even-aged management (pages 21-22). Because this definition is relevant primarily to the restocking requirements in Section subchapter 3.1(a)(4)(D), it deliberately excludes standing dead trees. This leaves the retention of standing dead trees subject only to the minimal requirements of Section 3.1. This is generally one metric ton of carbon per acre or 1% of standing live tree carbon stocks, in standing dead tree carbon stocks, whichever is higher.

Including standing dead trees in the stocking requirements is one way that the Forest Protocol could encourage the retention of large, standing dead trees, which are critical for wildlife. This would potentially be very positive for wildlife habitat even if it resulted in marginally lower stocking levels of live trees. Furthermore, counting large (e.g. greater than 12 3 inches dbh) standing dead trees may not have any negative impact on stocking of live trees, as projects are likely to manage for high live tree densities to maximize carbon stocks.
…
The Center for Biological Diversity urges ARB to develop ecological standards for the Forest Protocol to protect forest ecosystems and wildlife habitat from the damaging impacts of clearcutting and even-age management. California's efforts to reduce our greenhouse gas emissions should not rely on the most damaging forest management practices in California and nationwide and come at the expense of

forest ecosystems and wildlife habitat. Instead, management that promotes these important environmental co-benefits should be encouraged and rewarded. (CBD2)

Response: When ARB released the revisions to the Forest Protocol in October 2014 there was not an intent to add additional requirements above and beyond what was already required under the California Forest Practice Rule. However, in ARB's attempt to simplify the requirements, staff acknowledges these revisions cased some confusion. To address these comments and the confusion, staff has provided amendments to these sections to more precisely follow the California Forest Practice Rules.

The Environmental Assessment fully analyzed the potential for adverse impacts resulting from the Forest Protocol. The Forest Offset Protocol would not allow any forest management activity that is not allowed by state, federal, or local laws and regulations. The Forest Offset Protocol includes environmental safeguards to help assure the environmental integrity of forest projects. These include requirements for projects to demonstrate sustainable long-term harvesting practices, limits on the size and location of even-aged management practices, and requirements for natural forest management that require all projects to utilize
management practices that promote and maintain native forests comprised of multiple ages and mixed native species at multiple landscape scales.

Participation in the Forest Protocol requires projects to be beyond what would otherwise be required by law, regulation, or legally binding mandate, and to exceed what would otherwise occur in a conservative business-as-usual scenario. As a result projects will have mainly positive impacts on forest ecosystems and wildlife habitats as a result of reduced harvesting.

Under the Forest Protocol, harvesting (including clear-cut harvesting), does not generate offset credits. The protocol requires projects to maintain or increase the standing live carbon stocks in the project area. While harvesting may occur, the protocol accounts for harvesting as a decrease in standing live carbon stocks that must be compensated for by an increase in sequestration in the rest of the forest project lands. Offset credits will not be issued if, over

any consecutive 10-year period, the data reports indicate a decrease in the standing live carbon stocks.

In addition to the requirement to increase carbon on project lands, projects must be in compliance with all existing rules and regulations to be eligible for generating offsets. The protocol does not allow any forest management activity that is not already allowed by state, federal, or local laws and regulations. To the extent feasible, the protocol includes environmental safeguards to help assure the environmental integrity of forest offset projects. These include requirements for projects to demonstrate sustainable long-term harvesting practices, limits on the size and location of even-aged management practices, and requirements for natural forest management, which require all projects to use management practices that promote and maintain native forests comprised of multiple ages and mixed native species at multiple landscape scales.

Concerns about clear-cutting or even-aged management relate to how trees are harvested within a forest, but not directly to the carbon accounting that is at the heart of the protocol. It is possible to harvest more or less biomass than annual growth using even- or uneven-aged management. The protocol does not provide any incentive to harvest more frequently (regardless of method) or to clear-cut an area. Rather, the strongest incentive provided by the protocol is to increase the carbon in standing live trees, and increasing rotation ages (which decreases harvest frequency and intensity) is expected to be one of the most common improved forest management activities.

In accordance with these requirements, the Forest Protocol is not expected to increase the size of even-aged harvested areas or to result in plantation forests. Furthermore, modeling forest growth, mortality, and harvesting over time indicate that it would be unlikely for a forest project to remain eligible (i.e., demonstrate a continued net reduction in carbon sequestration), if conversion to a single-species, single-aged plantation occurred (2010 FED).

No changes were made to the standing or lying dead tree requirement in these amendments to the Forest Protocol. Forest projects are still required to meet the same requirements as found in the Forest Protocol initially adopted

by the Board in October 2011. Not including an additional standing or lying dead tree requirements would not result in an environmental impact because it would result in at a minimum continuation of the existing environmental setting. If the existing protocol requirements exceed what is currently present in the forest area the existing requirements would result in additional standing and lying dead trees being retained.

As with all offset projects, ARB will make available project location and additional data for program transparency. This will also allow all interested parties to evaluate if any areas of wildlife concern are also implementing an offset project.

ATTACHMENT B: ACRONYMS

AB 32	Assembly Bill 32 -- California Global Warming Solutions Act of 2006
ACR	American Carbon Registry
APD	Authorized Project Designee
APA	Administrative Procedures Act
ARB	California Air Resources Board
ARBOC	ARB offset credit
AWD	alternate wetting and drying
C-AGG	Coalition on Agricultural Greenhouse Gases
CAR	Climate Action Reserve
CCR	California Code of Regulations
CDFA	California Department of Food and Agriculture
CEQA	California Environmental Quality Act
CF	certified forester
CH_4	methane
CITSS	Compliance Instrument Tracking System Service
CO_2	carbon dioxide
COI	Conflict of Interest
COP	Compliance Offset Protocol
CP	Common Practice
CRC	California Rice Commission
DNDC	De-nitrification De-composition model
EPA	U.S. Environmental Protection Agency
FAQ	frequently asked questions
FIA	Forest Inventory and Analysis National Program
FSOR	Final Statement of Reasons
GHG	greenhouse gas
IETA	International Emissions Trading Association
HCVF	high conservation value forest
ICS	initial carbon stocks
IFM	improved forest management
ISOR	Initial Statement of Reasons
LMU	logical management unit
MBL	minimum basel line
MMC	Mine Methane Capture

$MTCO_2e$	metric ton of carbon dioxide equivalent
N_2O	nitrous oxide
NOVS	Notice of Offset Verification Services
ODS	ozone depleting substance
OPO	Offset Project Operator
OPDR	Offset Project Data Report
OPR	Offset Project Registry
QCE	Qualified Conservation Easement
SAF	Society of American Foresters
SOC	soil organic carbon
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
WCS	weighted average carbon stocks