

30 June 2014

Dear Dr. Chow,

Thank you for the opportunity to provide informal comments on the latest discussion draft of the Rice Cultivation Compliance Offset Protocol. We have enjoyed working with you on the Protocol over the last year and we would like to personally applaud the tremendous effort and attention to detail that your team has put forward on this Protocol. As Yachun expressed at the last Workshop, developing a model-based Protocol is a unique challenge, and the reflexivity you have evinced is commendable.

In this email, we have returned to the seven points we raised in the comments we submitted to the Board dated April 1 2014 related to the previous discussion draft of the Protocol in light of the new draft. We are thrilled to see so many clarifications of key ambiguities in the text. We continue to see several potential issues, to seek further clarifications, and we have attempted to provide solutions we see to these issues.

Of key note is the desire to see documentation of the performance test evaluation and assessments of model bias. Also, as the contract to develop an in-house version of DNDC for use in the Protocol advances, we hope there will be an opportunity for comment and input on the product of that work.

**1. Treatment of nitrous oxide (N<sub>2</sub>O) emissions and the threshold-approach to moisture content for Alternate Wetting and Drying (AWD) projects.**

Thank you for clarifying the questions we had regarding soil moisture sampling in section 2.3(c). We appreciate that areas of rice field can be made ineligible for crediting if they do not meet the requirements of soil moisture remaining above 35% after drying.

We remain curious however, how the three- or the five- equally spaced measurements in a field will be extrapolated to field areas that would be made ineligible if the measurement did not meet the threshold. In other words, does each sampling point correspond to a “footprint” of field acreage? If this is the case, this should be made clear. (It might be relatively easy to add a clause stipulating, for example, that each acre of field’s eligibility after drying is determined by the soil moisture sampling point that it is closest to it). Also, we remain concerned that it would be very easy for an OPO to use a portable measurement device that could be repeatedly placed in the soil until five “good” points (i.e., those meeting the 35% threshold) are obtained. We recommend including a restriction to prevent repeated sampling after the five measurements are made.

We appreciate the conservative approach the Protocol presents regarding the treatment of N<sub>2</sub>O fluxes from AWD projects, namely the exclusion of crediting of N<sub>2</sub>O emissions reductions and the use of the 35% threshold for soil moisture after “drying”.

We continue to be concerned that for AWD projects, the deductions of N<sub>2</sub>O emission increases from emissions calculations may be being underestimated in equation 5.4 in the

term  $\text{MIN}[\text{N}_2\text{O}_{\text{B,I}} - \text{N}_2\text{O}_{\text{P,I}}, 0]$ . Simply excluding  $\text{N}_2\text{O}$  emissions reductions from crediting, while conservative, does not address the fact that  $\text{N}_2\text{O}$  remains in the calculation of emissions reductions as a “debit” term, which may be very poorly estimated. We recognize that exclusion of the term is even less conservative as the value of  $\text{N}_2\text{O}_{\text{B,I}} - \text{N}_2\text{O}_{\text{P,I}}$  is likely to be negative and exclusion would default to “0”. We continue to believe that such uncertainty **would merit excluding AWD projects from eligibility until better data are available for  $\text{N}_2\text{O}$  spikes from such projects so the term can be better constrained in the equation.** We understand that there is no easy solution to this issue, pending better constrained and more intensive scientific measurements, if AWD continues to be an eligible project type.

## **2. Updating structural uncertainty deductions, DNDC model bias assessments, and a request for publically available data**

Thank you for clarifying the structural uncertainty deduction calculations, specifically how the  $\mu_{\text{struct}}$  term for each region is generated and for clarifying that term’s employment in Equation 5.4. Thank you also for your detailed and conservative approach to avoiding an inflation of hectares within the project that would have reduced the value of  $\mu$  artificially.

We continue to be concerned about the possibility of model bias (a separate issue from the structural uncertainty deduction factors) as described in more detail in the second point in our April 1 letter, and we continue to urge all data used for assessing model bias for all project types to be made available for review when the draft Protocol is put up for public comment.

## **3. Monte Carlo analyses and DNDC default values**

We appreciate the inclusion of the option to use either equation 5.2.1 or 5.2.2 for calculating unadjusted baseline emissions with differing numbers of Monte Carlo runs, which provides flexibility without sacrificing conservativeness. We also appreciate the clarification and updating of specific DNDC default values, including the atmospheric carbon dioxide concentration.

We hope that after the contracted development of ARB’s DNDC interface version, a period of public input on its functionality can be arranged.

## **4. Incentives created by the Protocol not to switch to shorter season rice varieties**

We continue to be concerned that the requirement of 3.1(a)(2) that eligible projects must grow rice of the same maturity characteristics could create a disincentive for business-as-usual water conservation measures to switch to shorter-season duration rice varieties. A simple solution could be to stipulate that all eligible projects must go rice of the same *or more rapid* maturity characteristics. We would welcome a discussion with you about ways to resolve this potential issue.

## **5. Avoiding the use of input parameters that are difficult to verify**

We continue to be concerned about the verifiability of baseline data from the mandatory historical record keeping for fields. This concern is especially held for fields in the California rice growing region, where average values over this period are critical in defining baseline emission rates to calculate emissions reductions. Verification using time-stamped, georeferenced digital photographs can be made to work when verifying project implementation in future years, but does not address the substantial challenge of verifying years of historical records in the baseline period.

## **6. Performance standard test and a request for data availability**

We appreciate that for dry-seeding projects, only fields that had previously wet-seeded are eligible for crediting. We appreciate that emissions reduction calculations for the other two project types are based on changes from baseline conditions that reflect records kept of past behavior on a given field. From a field-specific additionality perspective, this Protocol makes great strides in maintaining a conservative stance to avoid crediting non-additional activities.

However, as new practices are emerging with the goal of water conservation, understanding what has been the practice over the last five years may not, in some cases, be “business-as-usual” going forward. In order to assess what project types are and are not common practice, an assessment of trends moving forward would be very useful. In section 3.4.2(b) of the discussion draft, it is stated that the “performance standard evaluation is satisfied”. Making publically available the data used to perform this evaluation would be very helpful for those following the Protocol’s development.

When proposing the final package for 45-day comment, we would greatly appreciate if the Board staff could provide, in its supplementary or supporting material, the data that are being used to assess common practice in order to perform the performance standard evaluation in the various regions, in terms of the % of hectares of rice cultivation currently engaged in the eligible project types in the various regions.

## **7. Further discussion on the use of a simple model to set baselines in California, rather than farmer-generated data**

We note that the updated discussion draft continues to use the DD50 model for baselines in the Mid-South rice-growing region, and to use farmer-reported data in California. We believe that a more thorough discussion of the possibility of using a simple model for baseline setting in California is merited, as it may require less data management and verification and would not lead to any greater error than an estimated drainage date.

Thank you for your continued work and engagement with us on this Protocol.

Sincerely,

Aaron Strong and Barbara Haya