REVISION TO AMS-II.M. METHODOLOGY ELEMENT 2nd ASSESSMENT REPORT

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Methodology Title	Revision to AMS-II.M. Energy efficiency from installation of low-flow water devices	
Version	1.0 dated 06/06/2014	
Methodology Category	Methodology	
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	Module	
	Tool	
Sectoral Scope(s)	03 - Energy Demand	

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Summary:

Bureau Veritas Holdings SAS (Bureau Veritas) was retained by Challis Water and by the Verified Carbon Standard (VCS) to provide the second assessment of the proposed Methodology Element titled, "Revision to AMS-II.M. Energy efficiency from installation of low-flow water devices." The Methodology Element expands upon the approved Clean Development Mechanism (CDM) small-scale methodology "AMS-II.M. Demand-side energy efficiency activities for installation of low-flow hot water savings devices," Version 2.0. The revision is designed to include energy savings from low-flow water devices installed in non-residential buildings and to include inline devices which do not permanently replace baseline faucets. The Methodology Element revision also introduces alternative procedures for monitoring parameters and quantifying emission reductions.

The second assessment process consists of an independent third-party review of the Methodology Element to satisfy the VCS requirements for the methodology approval process.

This assessment focused on ensuring the changes resulting from the first assessment process are adequate and appropriate. Additionally, any subsequent requests for changes to the Methodology Element are addressed and approved.

The assessment criteria were the VCS Standard, v3.4 and the VCS Methodology Approval Process, v3.5 and the VCS Program Guide, v3.5. Bureau Veritas applied its professional judgement as informed by ISO 14064-3, 2004.

VCS requested six modifications to the Methodology Element which were sufficiently addressed by Challis Water and its consultants. Bureau Veritas requested one clarification that was addressed with an additional provision for the observation process. The technical reviewer requested four additional clarifications which were addressed by Challis. There were no uncertainties associated with the assessment.

The final version of the revised Methodology Element is titled, "Revision To AMS-II.M. Energy Efficiency From Installation Of Low-Flow Water Devices", Version 1.0, dated June 6,, 2014. Bureau Veritas believes the revised Methodology Element satisfies all relevant VCS requirements.

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1 INTRODUCTION

1.1 Objective

This second assessment report is provided to VCS by Bureau Veritas as a deliverable to satisfy the VCS methodology approval process for the proposed revisions to the CDM small-scale methodology AMS-II.M. "Demand-side energy efficiency activities for installation of low-flow hot water savings devices," Version 2.0. The proposed VCS methodology element is titled, "Revision to AMS-II.M. Energy efficiency from installation of low-flow water devices." This report provides a description of the steps involved in conducting the second methodology assessment and summarizes the findings of the assessment.

1.2 Summary Description of the Methodology

The ME expands upon the approved CDM small-scale methodology AMS-II.M. to include energy savings from low-flow water devices installed in non-residential buildings and to include inline devices which do not permanently replace baseline faucets. The methodology revision also introduces alternative procedures for monitoring parameters and quantifying emission reductions. More specifically, the revision allows for the use of reputable reference data or default factors instead of direct measurement of certain parameters required to determine the volume and temperature of water consumption by project and baseline devices.

Greenhouse gas (GHG) emissions reductions are achieved through reduced fossil fuel or electricity consumption required to heat the water. The same approach is used to determine the baseline scenario and demonstrate additionality as described in the original version of AMS-II.M. The ME provides revised procedures for determining methodology applicability, establishing the project boundary, monitoring water consumption and temperature, and quantifying annual energy savings with the project water devices.

2 ASSESSMENT APPROACH

2.1 Method and Criteria

The methodology assessment scope is defined as an independent and objective review of the proposed Methodology Element. The methodology assessment is conducted using the *VCS Standard: VCS Version 3, 8 October 2013, v3.4* (VCS Standard) as the criteria. The *VCS Methodology Approval Process, 8 October 2013, Version 3.5* (VCS Methodology Approval Process); the *VCS Program Guide, 8 October 2013, Version 3.5* (VCS Program Guide); and the ISO 14064-3 standard guided Bureau Veritas' process.

Bureau Veritas has established internal procedures for the conduct of Methodology Element assessments. Under these procedures we:

- Engaged with Challis Water and VCS to ensure our understanding of the scope of the project and determine preliminary costs. We discussed the project to ensure we could cover the sectoral scopes involved and meet the general timing and expectations for the project. We also engaged with VCS to ensure Bureau Veritas was acceptable to conduct the second assessment.

- Conducted an investigation for the actual or potential conflict of interest with the project. Through our database records we determined that we have no actual or potential conflict of interest with Challis Water or with First Environment (the first assessor of this methodology) for this project.

- Developed a proposal for VCS to perform the second assessment. This proposal outlined our planned activities and the assessment team used to complete the second assessment. In addition we submitted a cost proposal to Challis Water.

- Received documents related to the assessment from Challis Water. We conducted an initial review of the documentation to ensure we had the necessary information to complete the second assessment.

- Initiated contracts with VCS and Challis Water for the second assessment process. Both contracts were signed and processed internally by Bureau Veritas.

- Developed the validation plan outlining our anticipated process and outputs.

- Conducted necessary interviews with Challis Water's consultant to validate information in the Methodology Element.

- Received and evaluated clarification and corrective action requests from VCS.

- Reviewed the Methodology Element and the first assessment report. A formal review included a detailed review of the methodology and supporting documentation. Output from this review is included in this report.

- Developed the second assessment report using the VCS template.

2.2 Document Review

Bureau Veritas conducted a desktop review of the relevant documentation, including the proposed methodology, referenced similar methodologies, and the first assessment report. We reviewed the findings and corrective actions identified in the first assessment report. We reviewed the clarification and corrective action requests submitted by VCS.

During the second assessment we reviewed the following documentation:

- The original and subsequent versions of the Methodology Element.

- Public comments posted to the VCS website and Challis' written responses.

- CDM methodologies, tools, and guidelines, including clarifications and guidance issued by the small-scale working group.

- First assessment report submitted by First Environment.

- EB 75_repan21_AMS-II.M_ver 02.0, the CDM ME for Demand-side energy efficiency activities for installation of low-flow hot water savings devices.

2.3 Interviews

We interviewed Susan Woods, consultant for Challis Water, on several occasions to review VCS requests for modifications to the Methodology Element, clarify requirements for additionality and leakage, and to request clarification with respect to the requirements for monitoring. These interviews took place on April

8, 14, 29 and May 6. In addition, numerous email exchanges took place during April and May with respect to our questions and the assessment process.

2.4 Assessment Team

The second assessment team was led by David R. Church, Director, Climate Change Services, Bureau Veritas North America. Mr. Church has been the GHG program director for Bureau Veritas North America since 2003 and has broad experience with verification/validation of GHG inventories and projects. He has received formal training from numerous sources, including verification/validation for CDM and VCS projects.

No VCS expert was required or used for the assessment.

2.5 Resolution of Findings

Bureau Veritas did not raise any non-conformances during the second assessment process. Through the interviews with the consultant, we asked for clarification of several items, including:

a. How would Challis Water respond to the modifications suggested by VCS? These modifications were added to the Methodology Element and reviewed by Bureau Veritas. Bureau Veritas found the modifications to be acceptable.

b. Provide clarification about the additionality and leakage requirements for the Methodology Element. Challis Water provided additional information on the requirements for additionality and leakage for small-scale projects as defined by CDM. Bureau Veritas found these explanations to be acceptable.

c. Provide clarification on the monitoring plan and why it differs from the provisions in CDM AMS.II.M. Challis Water agreed to revise the Methodology Element to allow for the provision of biennial monitoring. Bureau Veritas found the revision to be acceptable.

3 ASSESSMENT FINDINGS

3.1 Relationship to Approved or Pending Methodologies

Not applicable.

3.2 Stakeholder Comments

No additional stakeholder comments received. Stakeholder comments were submitted during the stakeholder comment period and reviewed by Bureau Veritas during the 2nd assessment process. Bureau Veritas believes that each comment was satisfactorily addressed by Challis.

3.3 Structure and Clarity of Methodology

The Methodology Element is consistent with the VCS template and the structure of the existing AMS-II.M. Methodology Element.

The second assessment confirmed that the instructions in the VCS methodology template were followed accurately.

The methodology criteria and procedures are appropriately documented in the Methodology Element or referenced to the appropriate section of the original CDM Methodology.

The terminology utilized in the Methodology Element is consistent with that of the VCS program and the language appropriately and unambiguously identifies the necessary level of adherence to the methodology requirements.

The criteria and procedures are appropriately described and the revisions introduced to the original CDM methodology are clearly identified.

The criteria and procedures are readily applicable and consistent for appropriate auditing of the project activities.

3.4 Definitions

The Methodology Element introduces seven definitions of key terms either not included in the existing AMS-II.M. or that were revised to accommodate the proposed revisions. Specifically, it defines “Baseline device,” “Hotels“, “Equivalent level of service”, “Industrial building”, “Inline device”, “Non-residential building.”, and “Residential Building”. Bureau Veritas believes these definitions provide the necessary clarity to ensure the terms are used consistently throughout the ME and by project proponents.

3.5 Applicability Conditions

The Methodology Element identifies several changes to the applicability conditions given in AMS-II.M. Specifically:

1. Paragraph 2 was expanded to allow projects to occur in non-residential buildings and hotels..
2. Paragraph 3 was expanded to include removable inline devices, as further defined in the ME, as eligible technologies.
3. Paragraph 7 (a) was expanded to add the Enhanced Capital Allowance (ECA) Scheme for Water as an example of acceptable water saving device standards.
4. Paragraph 7 (d) and (e) were revised to provide more flexibility to project proponents at device installation.
5. Paragraph 8 was revised to only require an explanation of the method for collection, destruction, and/or recycling of baseline devices when baseline devices are removed as part of the project activity.

These revisions expand the applicability of the original AMS-II.M. methodology to allow for the inclusion of removable, inline low-flow water devices in non-residential buildings and hotels and provide alternative methods to assess device installation and project operation. The revised applicability conditions are appropriate for the project activities anticipated by Challis, and together with the new definitions establish clear criteria for assessing whether project activities and technologies are eligible under the methodology. The revised applicability conditions are consistent with the other revisions made to AMS-II.M. and the underlying assumptions and risks inherent in the quantification and monitoring procedures. Each of the revised applicability conditions is clearly written and sufficiently accurate to ensure appropriate determination of project conformance at the time of validation. Based on these observations, Bureau Veritas concluded that the revised applicability requirements given in the ME are appropriate, adequate, and consistent with the VCS Standard.

3.6 Project Boundary

No changes were made to the original requirements in AMS-II.M. for describing the project boundary and identifying relevant sources, sinks, and reservoirs (SSRs). Bureau Veritas confirms that the procedures in AMS-II.M. are adequate for projects applying the methodology revision.

3.7 Baseline Scenario

No changes were made to the original procedure in AMS-II.M. for determining the baseline scenario. Bureau Veritas confirms that the procedures in AMS-II.M. are adequate for projects applying the methodology revision.

3.8 Additionality

No changes were made to the original procedure in AMS-II.M. for determining additionality. Bureau Veritas confirms that the procedures in AMS-II.M. are adequate for projects applying the methodology revision.

3.9 Quantification of GHG Emission Reductions and Removals

3.9.1 Baseline Emissions

Consistent with the original AMS-II.M. methodology, baseline emissions are not separately quantified. See additional comments in Section 3.9.4.

3.9.2 Project Emissions

Consistent with the original AMS-II.M. methodology, project emissions are not separately quantified. See additional comments in Section 3.9.4.

3.9.3 Leakage

No changes were made to the procedure and determination for leakage emissions as included in AMS-II.M. Bureau Veritas confirms that the procedures in AMS-II.M. are adequate for projects applying the methodology revision.

3.9.4 Net GHG Emission Reductions and Removals

The general quantification approach for GHG emission reductions follows the procedure given in the original AMS-II.M. methodology. More specifically, emission reductions are calculated on the basis of the energy savings due to the reduction in the amount of water required to be heated as a consequence of the project implementation. The methodology revision introduces the option of utilizing default factors sourced from reputable, geographically specific, temporally relevant, published reference data to establish baseline and project activity parameters necessary to establish water flow rate and temperature. The methodology revision provides an alternate set of equations to be used when using default factors...

Bureau Veritas reviewed the quantification procedures and concluded that all relevant sinks, sources and reservoirs are covered in the project boundary. We confirm the use of default factors to be appropriate and in accordance with VCS requirements. We confirm that the methods to calculate GHG emission reductions are accurate and appropriate to ensure consistency with the VCS Standard.

3.9.5 Monitoring

The monitoring requirements and guidelines generally follow those given in the original AMS-II.M. methodology. The Methodology Element introduces two new parameters, i.e., $D_{calculated}$ and $W_{p,calculated}$,

which are required in the event that the project proponent opts to use default factors. Additionally, several parameters originally given in AMS-II.M. are revised to allow for the use of default factors or alternative monitoring methods. These include $T_{in,measured}$ and $T_{out, measured}$. The Methodology Element adequately establishes requirements for monitoring procedures, measurement frequency, and quality control and quality assurance for all data and parameters that have been added or modified as a part of the revision.

The monitoring plan described in the original AMS-II.M. methodology was revised in the Methodology Element as follows:

- allows for further flexibility in the documentation of initial device installation;
- provides additional guidance on sampling;
- requires additional project tracking and recordkeeping; and
- provides additional QA/QC guidance.

Bureau Veritas reviewed the changes to the modified monitoring parameters and confirms that they are appropriate and accurate for project activities using the Methodolgy Element. The requirements for the monitoring in the Methodology Element are well-defined and sufficient to ensure that uncertainties with respect to emissions reductions are minimized. Bureau Veritas believes the monitoring approach described in the ME satisfies relevant VCS requirements.

4 ASSESSMENT CONCLUSION

Bureau Veritas conducted the second assessment of the Methodology Element under the VCS methodology approval process, using the VCS Standard as the assessment criteria and guided by the VCS Methodology Approval Process and the VCS Program Guide. Based on our review and the satisfaction of requests for modifications to the methodology, we believe the stated criteria have been fulfilled. The Methodology Element was prepared according to the VCS Standard and is appropriately categorized under Sectoral Scope 03 – Energy Demand. The final approved version of the Methodology Element is dated 06/06/2014.

5 REPORT RECONCILIATION

Not applicable.

6 EVIDENCE OF FULFILMENT OF VVB ELIGIBILITY REQUIREMENTS

Bureau Veritas maintains accreditation with the Clean Development Mechanism designated as a validation/verification/certification body - CDM-E-0009. Under that accreditation, Bureau Veritas is approved for sectoral scopes 1-15. Bureau Veritas has conducted more than 30 validation projects and methodology assessments in the Energy Demand sectoral scope for small scale methodologies.

Therefore, Bureau Veritas is qualified to conduct the 2nd assessment for the proposed revision to the Methodology Assessment.

SIGNATURE

Signed for and on behalf of Bureau Veritas
May 7, 2014

Authorized signature on file

David R. Church
Lead Verifier/Director of Climate Change Services
Bureau Veritas North America

Signed for and on behalf of Bureau Veritas Certification Holdings SAS
August 14th, 2014

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Technical Review and approval conducted by:

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Bureau Veritas Certification India Pvt. Ltd.

APPENDIX

Resolution of Clarification Requests

Clarification Requests	Summary of Response	Assessment Conclusion
Section 4: Applicability Conditions VCS requests modification to include comment in Paragraph 7a to clarify the use of external schemes.	Paragraph revised by Challis Water to clarify the ECA scheme as an example standard. Footnote on page 5 removed.	2 May 2014 Response by Challis is acceptable.
Section 9.1: Monitoring VCS requests modification to include comments to clarify sources of default factors for the parameter $FR_{BL,measured}$.	Comments added to ME by Challis Water. Challis Water provided additional guidance on sources for default factors for $FR_{BL,measured}$. Also provided guidance to project developers on expectations for quality if locally sourced factors are used. Example given: Government study of the average flow rate of showerheads in a given area.	2 May 2014 Response by Challis is acceptable. Bureau Veritas believes VCS' concerns have been addressed..
Section 9.1: Monitoring VCS requests modification to include comments to clarify sources of default factors for the parameter $T_{out,measured}$.	Comments added to ME by Challis Water with guidance for sources of default factors for $T_{out,measured}$. Also provided guidance to project developers on expectations for quality if locally sourced factors are used. Example given: Government study of the average hot water temperature for showers in a given area.	2 May 2014 Response by Challis is acceptable. Bureau Veritas believes VCS' concerns have been addressed.
Section 9.1: Monitoring VCS requests modification to include comments to clarify sources of default factors for the parameter $T_{in,measured}$.	Comments added to ME by Challis Water with guidance for sources of default factors for $T_{in,measured}$. Also provided guidance to project developers on expectations for quality if locally sourced factors are used. Example given: Geological study showing groundwater temperature in a given area.	2 May 2014 Response by Challis is acceptable. Bureau Veritas believes VCS' concerns have been addressed.

Section 9.1: Monitoring VCS requests modification to include comments to clarify sources of default factors for the parameter $D_{calculated}$.	Comments added to ME by Challis Water with guidance for sources of default factors for $D_{calculated}$. Also provided guidance to project developers on expectations for quality if locally sourced factors are used. Example given: government study of the average minutes per day a person takes a shower in a given area.	2 May 2014 Response by Challis is acceptable. Bureau Veritas believes VCS' concerns have been addressed.
Section 9.3 – Description of the Monitoring Plan. VCS requested comments added to clarify the survey method options.	Comments added to ME by Challis Water. Challis Water provided additional guidance to project developers for conducting the annual survey and calculating response rates. An example is given to provide rationale for how to interpret survey response rates.	2 May 2014 Response by Challis is acceptable. Bureau Veritas believes VCS' concerns have been addressed.
Section 9.3: Description of the Monitoring Plan. Bureau Veritas requests clarification on why the bi-enniel inspection option was not included in the revision to the Methodology Element.	The bi-enniel inspection was added to the Methodology Element to be consistent with CDM AMS:II.M.	2 May 2014 Response by Challis is acceptable. The biennial inspection option has been restored to the ME
Section 3 (Definitions) Clarify if the non-residential buildings also cover the hotels (may be under commercial). Also, is it required to mention hotels also separately as they can be one of the largest users of this ME.	Change made to methodology. "Hotels" has been added as a definition and "Residential" has been added for clarification purposes.	23 June 2014 Response by Challis is acceptable. Bureau Veritas believes the addition of Hotels to the definition satisfies the request for clarification.
Section 4 (Applicability Conditions) Description / Mandatory requirement of DIRECT INTALLATION is removed from paragraph 7 (d). However, the same is described as mandatory PD requirement in Paragraph 8. Clarify if the paragraph 7 (d) should also include the direct installation as	Paragraph 8 has been clarified to state *"If the project activity is the permanent replacement of baseline devices (as opposed to installation of inline devices), the project description must explain the proposed method of direct*	23 June 2014 Response by Challis is acceptable. Bureau Veritas agrees the changes clarify the intent for the installation of

one of mandatory requirement to apply this methodology.	*installation of low-flow devices."* Paragraph 8 is now only applicable if the project is removing the baseline device and replacing it with a low-flow device, as opposed to installing an inline low flow device.	baseline devices.
Section 8 (Quantification of GHG emission reductions and removals) Considering the daily value of parameters ($W_{BL,Calculated}$ and $W_{P,Calculated}$) and equation 3a, it seems in appropriate if ΔW is calculated for number of days not equal to 365. Clarify the correctness of the unit of measurement in view of entire energy saving calculations.	The formula is correct. We have added some clarifying text. WBL,calculated and WP,calculated are daily calculations that are then turned into an annual calculation by multiplying the difference by 365 in equation 3a. An alternative would be to multiply equations 3b and 4 by 365 and then remove the 365 from equation 3a.	23 June 2014 Explanation by Challis is acceptable. Bureau Veritas agrees the clarification sufficiently answers the question.
Section 9.3 (Data Management and Data Quality for Parameters) In the description of the database and its constituents, Project type mentions "residential or *commercial*". This is not in line with the definitions and scope of expansion of approved CDM methodology. Please explain the same.	The term "commercial" has been removed and replaced with "non-residential, or hotels".	23 June 2014 Response by Challis is acceptable. The change in terms from "commercial" to "non-residential, or hotels" clarifies the intent for project type.