

# VALIDATION REPORT FOR METHODOLOGY REVISION TO CLEAN DEVELOPMENT MECHANISM METHODOLOGY AMS.III-Y, METHANE AVOIDANCE THROUGH SEPARATION OF SOLIDS FROM WASTEWATER OR MANURE TREATMENT SYSTEMS



Document Prepared By First Environment, Inc.

<b>Methodology Element Title</b>	Methodology Revision to Clean Development Mechanism Methodology AMS.III-Y, Methane avoidance through separation of solids from wastewater or manure treatment systems	
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<b>Methodology Element Category</b>	Tool	
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**Summary:**

First Environment, Inc. (First Environment) was retained to perform the first assessment in the VCS double-approval process for the Methodology Revisions proposed by NativeEnergy, Inc. (NativeEnergy) to the CDM Methodology AMS.III-Y, "Methane avoidance through separation of solids from wastewater or manure treatment systems," Version 3. The methodology revision modifies applicability conditions and baseline emission quantification methods.

The methodology assessment process consists of an independent third-party review of the Methodology Revision. In particular, the assessment confirms that the Methodology Revision and any associated tools are consistent with all relevant VCS rules and procedures. The assessment of the Methodology Revision and associated tools is done through a double-approval process, according to the VCS Standard, and is necessary to provide assurance to stakeholders of the quality of the new Methodology Revision.

First Environment used the following documents as the criteria for the validation:

- VCS Standard: VCS Version 3, 1 February 2012, v3.2
- VCS Methodology Approval Process, 1 February 2012, Version 3.3

The validation was performed according to the process described in the VCS Program Guide, 1 May 2012, Version 3.3. Additionally, First Environment applied its professional judgment as informed by ISO 14064-2 to evaluate the proposed Methodology Revision.

During the assessment process, First Environment issued several clarification and corrective action requests – all of which were addressed sufficiently by NativeEnergy. First Environment is of the opinion that the Methodology Revision dated May 29, 2012 meets all relevant VCS requirements.

Following the second assessment of the methodology, First Environment subsequently reviewed version 3.8 of the Methodology Revision, dated December 21, 2012. First Environment is in agreement with the revisions made in version 3.8 of the Methodology Revision.

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## 1 INTRODUCTION

This report is provided to NativeEnergy as a deliverable of the Verified Carbon Standard (VCS) Methodology Revision (MR) assessment process for the proposed VCS MR entitled “Methodology Revision to Clean Development Mechanism Methodology AMS.III-Y, Methane avoidance through separation of solids from wastewater or manure treatment systems.” This report provides a description of the steps involved in conducting the first assessment as a part of the VCS double-approval process and summarizes the findings of the assessment.

First Environment, Inc. (First Environment) was provided the initial version of the MR which is dated January 30, 2012. Based on this documentation, the Audit Team performed a document review and desktop audit which resulted in corrective action requests (discussed later in this report) and revisions to the MR. The final version of the MR, dated May 29, 2012, serves as the basis of the final conclusions presented herewith.

### 1.1 Objective

The purpose of the methodology assessment is to have an independent third party assess the conformance of the MR with VCS requirements.

### 1.2 Scope and Criteria

The methodology assessment scope is defined as an independent and objective review of the proposed MR. The methodology assessment is conducted using the *VCS Standard: VCS Version 3, 1 February 2012, v3.2* and the *VCS Methodology Approval Process: VCS Version 3, 1 February 2012, Version 3.3* as the criteria. The *VCS Program Guide, 1 May 2012, Version 3.3* and the ISO 14064-3 standard provide guidance for the validation process.

First Environment and NativeEnergy have agreed that a reasonable level of assurance be applied to this assessment.

### 1.3 Summary Description of the Methodology Element

The MR is a revision to the VCS-approved CDM methodology AMS-III.Y, “*Methane avoidance through separation of solids from wastewater or manure treatment systems,*” Version 3. The primary objective of the revision is to extend the applicability of the methodology to project activities where organic bedding is used in barns. The MR also revises the equations from AMS.III.Y for baseline emission quantification to maintain their accuracy and integrity in light of the removal of the applicability condition barring organic bedding. Supplemental monitoring parameters are added to the methodology to support the revisions made to the quantification approach, as appropriate.

## 2 ASSESSMENT APPROACH

### 2.1 Method and Criteria

The following assessment process was used:

- conflict of interest review;
- selection of assessment team;
- kick-off meeting with NativeEnergy;
- development of the validation plan;
- desktop review of the MR and other relevant documentation;
- follow-up discussions with NativeEnergy for supplemental information as needed as well as corrective action cycle; and
- validation reporting.

The validation process was utilized to evaluate whether the MR is consistent with the stated criteria. A methodology assessment checklist was developed which summarizes the criteria used to evaluate the MR, the conformance of the MR with each criterion, and the Audit Team's assessment findings.

### **Conflict of Interest Review**

Prior to beginning any assessment project such as this, First Environment conducts an evaluation to identify any potential conflicts of interest associated with the project. No potential conflicts were found for this project.

### **Audit Team**

First Environment's audit team consisted of the following individuals who were selected based on their VCS methodology assessment experience and relevant experience in the MR's sectoral scope.

Lead Auditor – Michael Carim  
Auditor – Iris Caldwell, Ross MacWhinney  
Internal Reviewer – James Wintergreen

### **Audit Kick-off**

The assessment process was initiated with a kick-off conference call on February 10, 2012 between First Environment and the primary NativeEnergy contact, Sean Breen. The communication focused on confirming the assessment scope, objectives, criteria, schedule, and the information required for the methodology revision assessment.

### **Development of the Validation Plan**

Based on the information discussed during the kick-off conference call, the Audit Team formally documented its validation plan and provided the validation plan to NativeEnergy.

### **Desktop Review**

The Audit Team performed a desktop review of the MR and supporting documentation, as further described in Section 2.2 below.

### **Corrective Actions and Supplemental Information**

The Audit Team issued requests for corrective action and clarification during the MR assessment process, as described in Section 2.5. The corrective action and clarification requests and the responses provided by NativeEnergy are summarized in Section 4.

### **Validation Reporting**

Validation reporting, represented by this methodology assessment report, documents the methodology assessment process and identifies its findings and results.

## **2.2 Document Review**

Eligibility requirements, baseline approach, project boundaries, emissions quantification, leakage, data monitoring, and other pertinent criteria were assessed to evaluate the MR against VCS program requirements. Discrepancies between the assessment criteria and the MR were considered material and identified for corrective action, as further described in Section 2.5.

## **2.3 Interviews**

The Lead Verifier held teleconferences with Native Energy's Sean Breen during the course of the MR assessment.

## 2.4 Use of VCS-Approved Expert

A VCS-approved expert is not required because the MR is not a non-ARR AFOLU methodology element and does not use a standardized method; therefore, First Environment did not retain an expert for the purposes of conducting this methodology assessment.

## 2.5 Resolution of Any Material Discrepancy

The Audit Team issued formal requests for corrective action, clarification, and supplemental information during the methodology assessment process. Discrepancies between the MR and the VCS Standard were identified for corrective action and required appropriate justification. Clarification and supplemental information requests served to provide the Audit Team additional context or background information in order to complete the assessment process. NativeEnergy was given the opportunity to resolve the requests through the submittal of additional evidence or justification, revisions to the MR, and/or other means as appropriate. The specific corrective action and clarification requests issued by the Audit Team, as well as the responses provided by NativeEnergy, are summarized in Section 4.

## 2.6 Internal Quality Control

First Environment is an accredited validation and verification body by the American National Standards Institute (ANSI). This accreditation assures the quality controls inherent in the assessment process, which includes an independent internal review process as required by the ISO 14064-3 standard. The Internal Reviewer, who is selected as a senior member of First Environment's staff, conducts a high-level review of the methodology assessment activities and conclusions and confirms that they are consistent with the assessment criteria as well as First Environment's internal management procedures. All issues identified during the internal review are resolved before the issuance of deliverables to the client.

# 3 ASSESSMENT FINDINGS

## 3.1 Applicability Conditions

The MR identifies changes to the original methodology's criteria for assessing the eligibility of manure management projects using mechanical solid/liquid separation equipment. Specifically, the MR modifies the original methodology's applicability requirements in the following ways:

- Condition 6(b), that "No organic bedding material is used in the animal barns or intentionally added to the manure stream", is deleted.

The proposed revision to the applicability conditions is justified because the quantification methodology for baseline emissions is not based on direct measurement of the mass of solids separated and is not affected by the potential introduction of organic beddings solids to the animal waste management system. Instead, baseline emissions are quantified from the total amount of manure generated and the solids removal efficiency of solids/liquid separation equipment. Further, the MR includes a deduction to baseline emissions to account for organic bedding solids that may bypass the solids separation equipment and be disposed of in anaerobic treatment systems.

## 3.2 Project Boundary

No changes were made to original requirements in AMS-III.Y for describing the project boundary and identifying and identifying relevant SSRs.

## 3.3 Procedure for Determining the Baseline Scenario

No changes were made to original procedure in AMS-III.Y for determining the baseline scenario.

## 3.4 Procedure for Demonstrating Additionality

No changes were made to original procedure in AMS-III.Y for demonstrating additionality.

### 3.5 Baseline Emissions

The MR modifies the means for measuring and quantifying baseline emissions to prevent these from including emissions associated with the removal of volatile solids contributed to the animal waste management system by organic bedding material, by providing an alternative approach to estimating the mass of total volatile solids separated that does not require direct measurement of the mass of solids separated. The alternative method provided calculates the mass of solids separated from the product of the average percent of manure from the livestock animal type that is delivered to the separation process, the number of animals by livestock animal type, the annual amount of total solids excreted by one animal of that animal type, and the separation efficiency of the solids/liquid separation system in removing solids from the influent manure stream.

For projects based in the United States, the MR provides equations to calculate the total solids excreted per animal from an American Society of Agricultural Engineers (ASAE) source. Project activities located outside the US use country-specific values for total solids excretion. Where this data is unavailable, IPCC default values for volatile solids excretion per animal are used and the MR provides guidance on changes to baseline emission equations that are made in this case.

The efficiency of the solids/liquid separation system in removing solids from the influent manure stream is determined through site-specific sampling. The efficiency is calculated by subtracting the product of the mass of liquid manure effluent and the percent of total solids of liquid effluent from the product of the mass of manure influent by the percent of total solids of influent, and dividing this difference by the mass of manure influent. Sampling to determine separator efficiency is performed at project start up and annually thereafter.

The baseline emissions quantification method is also modified by including the fraction of separated solids that bypass the separation system as a result of recycling and particle size reduction and the fraction of separated solids that are used in the project barns for bedding in the baseline equation. These parameters are included as an adjustment to account for any organic bedding that breaks down into particles small enough to pass through the separation system and that might enter the project's anaerobic lagoon.

First Environment reviewed all formulae and quantification methods for accuracy and concluded that the approach to calculate baseline emissions is appropriate, adequate, and consistent with the VCS Standard.

### 3.6 Project Emissions

No changes were made to the procedure in AMS-III.Y for quantifying project emissions.

### 3.7 Leakage

No changes were made to the procedure in AMS-III.Y for leakage emissions.

### 3.8 Quantification of Net GHG Emission Reductions and/or Removals

No changes were made to AMS-III.Y's original quantification method for net GHG emission reductions and/or removals. Emission reductions are calculated as the difference between baseline and project emissions minus emissions from leakage.

### 3.9 Monitoring

The monitoring of all data and new parameters required to quantify emissions are described and appropriately defined in the MR. Specifically, the MR establishes requirements for monitoring procedures, measurement frequency, and quality control and quality assurance for all monitored data and parameters that have been added to the underlying methodology as a part of the revision. Additional parameters are added to determine the separation efficiency of liquid/solid separation equipment, mass of total solids generated by animals, and the amount and density of recovered solids used as bedding. First

Environment determined that the monitoring approach is appropriate and sufficient in order to obtain the necessary data for emission reductions quantification as well as meets relevant requirements in the VCS Standard.

### 3.10 Data and Parameters

The MR describes all data parameters required for emission reduction quantification and classifies them as either monitored or not monitored. The descriptions include source of data, unit of measurement, measurement procedures and frequency, default values where appropriate, and other comments necessary for project implementation or validation/verification. First Environment concluded that the data and parameters given in the MR and the associated requirements for measurement are appropriate and sufficient to reduce uncertainty in the emission reduction calculations.

### 3.11 Use of Tools/Modules

First Environment has confirmed that the MR does not include the use of any additional tools or modules beyond those already incorporated by in the underlying methodology.

### 3.12 Adherence to the Project Principles of the VCS Program

The MR was developed in accordance with the requirements of the VCS and adequately addresses the principles of relevance, completeness, consistency, accuracy, transparency, and conservativeness.

### 3.13 Relationship to Approved or Pending Methodologies

The document assessed is a revision of the CDM methodology AMS III.Y. There are no other pending or approved methodologies that are similar in scope.

### 3.14 Stakeholder Comments

The MR did not receive any comments during the public stakeholder consultation process.

## 4 RESOLUTION OF CORRECTIVE ACTION REQUESTS AND CLARIFICATION REQUESTS

As described above, the Audit Team requested corrective actions, clarification, and supplemental information during the methodology assessment process. The clarification and corrective action requests issued and the responses provided are summarized in the tables below:

ID	Corrective Action Request	Summary of Methodology Developer Response	Validation Conclusion
1	Please identify or provide further definition for the sources of industry average values used in QA/QC procedures for relevant monitored parameters.	NativeEnergy provided descriptions of the industry average values to be applied as QA/QC measures and incorporated footnotes of the same into the relevant parts of Section 9.2 of the methodology revision to provide examples to users of the methodology.	Response is acceptable.
2	Please provide separate definitions for the following parameters in section 9.2: <ul style="list-style-type: none"> <li>• mInfl</li> <li>• %TSInfl</li> <li>• mLEffl</li> <li>• %TSLEffl</li> </ul>	Separate boxes were added to Section 9.2 describing the monitoring requirements for each of the identified parameters.	Response is acceptable.
3	The following parameters are not	BW <sub>average</sub> and BW <sub>heifer</sub> were added to Section	Response is

ID	Corrective Action Request	Summary of Methodology Developer Response	Validation Conclusion
	<p>described in Section 9 of the Methodology Revision</p> <ul style="list-style-type: none"> <li>• <math>BW_{average}</math></li> <li>• <math>BW_{heifer}</math></li> </ul>	<p>9.2 of the Methodology Revision as monitored parameters.</p>	<p>acceptable.</p>
4	<p>Please clearly define the adjustments to the baseline emissions quantification method for project activities where solids separation exists in the baseline scenario.</p>	<p>NativeEnergy provided an equation in Section 8.1 of the methodology revision to identify how <math>EFF_{ss,y}</math> is adjusted to account for solids separation in the baseline scenario.</p>	<p>Response is acceptable.</p>
5	<p>Please specify the accreditation and test method requirements needed for the lab services related to the determination of <math>EFF_{ss,y}</math>.</p>	<p>Information was added as a footnote to the monitoring parameter <math>EFF_{ss,y}</math>. Laboratories providing testing of manure samples need to be accredited in accordance with ISO 17025:2005. Required on-site samples and measurements will be done in accordance with procedures set forth by the testing lab and will be designed to achieve an overall outcome with 90%/10% confidence/precision.</p>	<p>Response is acceptable.</p>

ID	Clarification Request	Summary of Methodology Developer Response	Validation Conclusion
1	Please clarify whether the ASAE equations and values used to determine total solids excretion in each livestock category are applicable to project activities located outside the United States.	NativeEnergy clarified that the ASAE values for total solids excretion and the adjustment to determine volatile solids excretion are applicable to US-based projects only and that IPCC default values for volatile solids excretion will be used for project activities located outside the United States, where country-level data on total solids excretion rates are unavailable. Additional guidance was added to the methodology for the quantification of baseline emissions when using IPCC default values for volatile solids excretion in lieu of total solids excretion data.	Response is acceptable.
2	Please clarify whether organic bedding is acceptable in the baseline scenario and whether this has any impact on the application of the SS <sub>bypass</sub> adjustment factor.	NativeEnergy confirmed that the use of organic bedding in the baseline scenario is permissible. Regardless of whether organic bedding is used in the baseline, the SS <sub>bypass</sub> factor is to be applied in emission reduction calculations. This is conservative.	Response is acceptable.
3	Please clarify the relevance of the proposed revision to the determination of project emissions from manure transport given that the AMS-III.Y only requires the inclusion of "incremental" increases in transportation in the project scenario.	The revision to project emissions quantification cited in the clarification request was removed from the methodology revision.	Response is acceptable.

## 5 ASSESSMENT CONCLUSION

First Environment performed the methodology assessment of the MR as part of the VCS double-approval process. First Environment used the VCS Standard as the criteria for the assessment. The assessment process was further guided by the VCS Methodology Approval Process and the VCS Program Guide.

The review of the MR and the satisfaction of corrective action and clarification requests have provided First Environment with sufficient evidence to determine the fulfillment of stated criteria.

The MR was prepared in accordance with the VCS Standard, the VCS Methodology Approval Process, and the VCS Program Guide. The proposed methodology belongs to Sectoral Scope 13 – Waste handling and disposal.

In summary, it is First Environment’s opinion that the MR titled, “Methodology Revision to Clean Development Mechanism Methodology AMS-III.Y, Methane avoidance through separation of solids from wastewater or manure treatment systems” dated May 29, 2012, meets all relevant VCS requirements.

## 6 REPORT RECONCILIATION

In November 2012, First Environment was provided with a revised version of the MR as a result of changes made during the second validation assessment. As the first assessor of the MR, we support the changes resulting from the second validation, specifically the MR Version 3.8 dated December 21, 2012.

In the quantification of baseline emissions for U.S.-based projects where site specific data is unavailable to determine total solids excretion per animal ( $TS_{LT,y}$ ), the MR allows the use of default values from the ASAE. During the reconciliation process, the MR was updated to clarify that the most recently available data from the ASAE shall be used in determining  $TS_{LT,y}$  in this circumstance.

Equation 6 used in the quantification of baseline emissions was also modified to correct an error in the formula.

During the course of the second assessment, the title of the MR was changed to "Revisions to AMS.III-Y to Include the Use of Organic Bedding Material."

## 7 EVIDENCE OF FULFILMENT OF VVB ELIGIBILITY REQUIREMENTS

First Environment, Inc. holds accreditation to perform validation for projects under Group 06 (Waste handling and disposal), as defined by the American National Standards Institute (ANSI). First Environment has also completed more than 10 previous methodology and project validations in ANSI Group 06. First Environment, therefore, is eligible under the VCS programme to perform assessments for the ME, which falls under Group 06.

## 8 SIGNATURE

Signed for and on behalf of First Environment, Inc. on January 3, 2013.



Michael Carim  
Associate



James Wintergreen  
Senior Associate