CDM: Response form for request for clarification on Approved Methodologies (version 01.1)

Date of Meth Panel meeting:	23 - 27 June 2008
Title and number of request for clarification	Application of '95% confidence level' and 'statistically valid number of samples' requirement AM_CLA_0095

Summary of the query:

Please use the space below to summarize the request for clarification on the related approved methodologies.

ACM0001 "Consolidated baseline and monitoring methodology for landfill gas project activities" version 8 states that page 15 of ACM0001 version 8 states that: "The fraction of methane in the landfill gas (wCH4,y) should be measured with a continuous analyzer or, alternatively, with periodical measurements, at a 95% confidence level , using calibrated portable gas meters and taking a statistically valid number of samples and accordingly the amount of land fill gas from $LFG_{total,y}$, $LFG_{flare,y}$, $LFG_{electricity,y}$, $LFP_{L,y}$ and $LFG_{thermal,y}$ shall be monitored in the same frequency.

Clarification is sought on:

1. The application of "95% confidence level":
   (a) The confidence interval can be calculated from daily values, monthly values or the whole sample population. The methodology does not give guidance on at which frequency should the calculation of confidence interval be conducted;
   (b) A confidence interval is calculated *ex post*; without a population of measured values there can be no calculation of the confidence interval. The development of a monitoring plan on the basis of the methodology requirement seems to require that the measurement frequency is fixed *ex ante*;
   (c) The confidence interval is a range in which one expects 19 out of 20 CH4% measurements [95%] to fall when [new] samples are analyzed. This assumes that the population from which the samples are taken does not change, and that the sample is representative. However, the population does often change. New wells with higher CH4% will result in samples that fall out of the 95% confidence interval. Also, the CH4% parameter is not independent; increased LFG flow will lower the %CH4. Both situations would result in values out of the 95% confidence interval, which in the current context of the methodology could be interpreted as a sampling frequency problem;
   (d) The confidence level is the basis for the calculation of a range [confidence interval]. There are no criteria *ex post* or *ex ante* for checking the sampling results against the calculated confidence interval. Project proponents therefore seek clarification on how the "measurement at 95% confidence level" should be carried out in practice, and how this can be included in the design of the monitoring plan in the PDD;
2. The requirement for "statistically valid number of samples":
   (e) "Statistically valid" suggests that there is a criterion against which the number of samples can be tested. This criterion does not seem to be present in the methodology. Therefore it is not clear how one can decide whether or not the number of samples is "statistically valid" or not. We are seeking clarification on how the statistical validity of the number of samples can be assessed during the design of the monitoring plan.

Recommendation by the Meth Panel:

Please use the space below to provide amendments /changes (in your expert view, if necessary).

See comments below.

Answer to authors of the request for clarification by the Meth Panel :

Please use the space below to provide an answer to the authors of the above query

The Meth Panel clarifies the following:

- If the captured gas is flared, ACM0001 refers to the Methodological Tool "Tool to determine project emissions from flaring gases containing methane" in order to estimate project emissions from flaring. In this tool, it is required to **continuously monitor** the methane content in the residual gas (unless a default value for flare efficiency is adopted). For this case, the fraction of methane in the landfill gas ($w_{CH4,y}$) should be measured with a **continuous analyzer**;
- In case the captured gas is used to produce energy or a default value for flare efficiency is adopted, the Meth Panel recommends allowing the option of conducting periodical measurements with a minimum of **4 quarterly** measurements per year. The lower bound of the 95% confidence interval obtained from the periodical measurements should be used to estimate baseline methane emissions to ensure conservativeness. The attached revised version of the methodology contains the recommended revision.

Signature of Meth Panel Chair ……..
Date: 27/06/2008 *(Akihiro Kuroki)*

Signature of Meth Panel Vice-Chair ……..
Date: 27/06/2008 *(Philip Gwage)*

Information to be completed by the secretariat	
F-CDM-AM	AM_CLA_0095
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