


|  <b>CDM: Form for submission of requests for deviation prior to submitting request for issuance</b><br><i>(To be used by the DOE for requesting a deviation prior to submitting request for issuance)</i>   |  |            |                |            |         |                      |        |
|--|--|------------|----------------|------------|---------|----------------------|--------|
| <b>Name of the entity (DOE) submitting this form</b>   | DNV  |            |                |            |         |                      |        |
| <b>Project Ref./Title of the project activity</b>  | 1564: AWMS Methane Recovery Project MX07-S-113, Aguascalientes, México |            |                |            |         |                      |        |
| <b>Title/subject of deviation</b>  | Measurement of methane content of biogas and flare efficiency          |            |                |            |         |                      |        |
| <b>Specify the monitoring period for which the request is valid</b>  | 25 Sep 2008 - 31 Jul 2010  |            |                |            |         |                      |        |
| <b>Date and signature for the DOE</b>  | 27/12-11 <i>Taye Folkestad</i>   |            |                |            |         |                      |        |
| <b>Please use the space below to describe the deviation and substantiate the reason for requesting a deviation from provisions of registered monitoring plan.</b>  |  |            |                |            |         |                      |        |
| <p>This request is to allow deviation of measurement of methane content of biogas as specified by the parameter MC in Table B.7 of the registered PDD by measuring the CO<sub>2</sub> content of biogas and calculating the methane content instead of directly measuring the methane content. This request is also to allow for deviation of testing flare efficiency as specified by the parameter EFP in Table B.7 of the registered PDD by applying the default value allowed in "Tool to determine project emissions from flaring gases containing methane" for periods where the flare efficiency was measured less frequently than annually.</p> <p>MC</p> <p>The project developer has undergone an extensive evaluation and selection process to find the most reliable and durable equipment for measuring methane at its project activities. This process took considerably longer than anticipated by the project developer. At this time, the project developer has identified and begun using this monitoring equipment and, as of October 2008 (for site 3304244) and January 2009 (for site 3280021), the direct measurement of methane has been implemented in accordance with the monitoring methodology and the monitoring plan and this practice will be used for all subsequent monitoring periods.</p> <p>Prior to measuring the methane content the project developer has monitored the methane content of biogas using practices considered to be correct during validation and identical to the monitoring practices at other registered and verified projects by the same project developer applying AM0016 version 02.</p> <p>Biogas consists of mainly CO<sub>2</sub> and methane. Recent measurements of both the methane and CO<sub>2</sub> content of biogas taken from sites within this project activity showed that the sum of CO<sub>2</sub> and methane averaged 97.53% with a 95% confidence level of 94.11%. An earlier analysis of other similar advanced Animal Waste Management Systems (AWMS) in Brazil and Mexico, developed by the same project developer and applying the same project technology showed that the sum of CO<sub>2</sub> and methane averaged 99.0% with a 95% confidence level of 96.7%. However, in order to be most conservative, the project developer has opted to use the minimum value of the sum of CO<sub>2</sub> and methane found in its testing as the value to be applied across the all projects of this methodology version. This value is 93.6% for site 3280021 and 93.5% for site 3304244 for the sum of CO<sub>2</sub> and methane, rounded down to 93% with 7% trace or other gas. Hence, if this request for deviation is accepted, the percentage of methane in biogas will be calculated as 93% minus the percentage of CO<sub>2</sub>.</p> <p>Measurements of the percentage of CO<sub>2</sub> in biogas have the same accuracy as measurements of the percentage of methane. Hence, the monthly measurement of the percentage of CO<sub>2</sub> and the calculation of the percentage of methane as described above ensures in our opinion the same level of accuracy.</p> <p>EFP</p> <p>According to the monitoring plan, the flare efficiency shall be measured at least annually. This frequency meets the general guidance for SSC CDM Methodologies which states in paragraph 12b, "Data elements that are generally constant and indirectly related to the emission reductions (e.g. Emission factors, Calorific Value, System Efficiencies) should be measured or calculated at least once in a year, unless detailed specifications are provided as part of the indicated methodology". AMS-III.D, version 11, applied by the project does not specify the frequency of measuring the flare efficiency.</p> <p>The frequency of flare efficiency measurements was less than annually for the sites with the following IDs: 3280021 and 3304244. The period of time elapsed per site without coverage of annual flare efficiency measurements is as follows:</p> <table border="1"> <thead> <tr> <th>Site ID</th> <th>Period Applied</th> <th>Applied FE</th> </tr> </thead> <tbody> <tr> <td>3280021</td> <td>25 Sep 08 - 6 Oct 08</td> <td>50.00%</td> </tr> </tbody> </table> |  | Site ID    | Period Applied | Applied FE | 3280021 | 25 Sep 08 - 6 Oct 08 | 50.00% |
| Site ID  | Period Applied   | Applied FE |                |            |         |                      |        |
| 3280021  | 25 Sep 08 - 6 Oct 08   | 50.00%     |                |            |         |                      |        |

3304244■ 25 Sep 08 - 1 Oct 08■ 50.00%

This thus represents a deviation from the monitoring plan. Hence, in the periods covered in column “Applicable period” it is suggested to apply a conservative flare efficiency of 50% as stipulated by the “Tool to determine project emissions from flaring gases containing methane”. The flare was confirmed to be operational on the basis of the weekly observations performed. Flare efficiency measurements show that the actual flare efficiencies are considerably higher than the 50% default. Therefore, applying the default value to the periods in column “Applicable period” is in our opinion a conservative approach.

Continuous monitoring of compliance of the flare with manufacturer’s specification is ensured by inspecting the flare regularly (typically weekly) and recording malfunctioning of the flare. If malfunctioning of the flare is recorded, the reported emission reductions are adjusted by not including the biogas produced from the day the flare was last observed to function properly to the day the flare is again functioning properly after malfunctioning of the flare has been observed. Moreover, the flares at all farms have a temperature and pressure measure device that assures the effective combustion of methane during the time the biogas is directed to the flare. If the temperature decreases, the electronic system closes the main valve and restarts after a few minutes with an electric spark. The flare design ensures that no gas is sent through the flare without the flare being ignited.

**Please use the space below to describe and substantiate the assessment of the DOE that the deviation does not require a revision of monitoring plan or the changes from the project activity as described in the registered project design document.**

As of October 2008 (for site 3304244) and January 2009 (for site 3280021), the direct measurement of methane has been implemented in accordance with the monitoring methodology and the monitoring plan and this practice will be used for all subsequent monitoring periods. To use measurements of the CO<sub>2</sub> content of biogas to calculate the methane content instead of directly measuring the methane content is required due to the project participants initially not finding reliable and durable equipment for measuring methane at its project activities. Also the flare efficiency measurements have, and will continue to, occur on a regular basis at least annually. Hence, a request for deviation is suitable in accordance with paragraph 212 of the Validation and Verification Manual (Version 01.2).

**Please use the space below to describe the impact of the deviation on the estimates of the emissions reductions for the proposed project activity with the use of approved methodology as existing and with the deviation. Please substantiate the estimations with relevant and verifiable data.**

The deviation is expected to result in an underestimation of the emission reductions as it is conservatively assumed that biogas contains 7% trace gases and that the flare efficiency is 50%, respectively.

**Link to the monitoring report**

<https://cdm.unfccc.int/Projects/DB/TUEV-SUED1200590100.46/iProcess/DNV-CUK1283846763.9/view>

**If necessary, list attached public files containing relevant information which is not available through the above link**

Spreadsheet with recent methane and CO<sub>2</sub> content measurements at sites within this project activity.