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| Your ref.: | Our ref.: | Date: |
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# Validation opinion – Request for revision of monitoring plan
## Irani Wastewater Methane Avoidance Project (1410)

We refer to the procedure for revising monitoring plans adopted at EB 26. We herewith request a revision of the monitoring plan for project activity 1410 entitled "Irani Wastewater Methane Avoidance Project" in Brazil. The project applies the approved simplified methodology AMS-III.I (version 06).

The reason for the revision of the monitoring plan is due to the fact that the monitoring plan described in the Project Design Document (PDD) is not in accordance with the actual practices from the Project Developer. The document was written in a way that led to misinterpretations of the monitoring system. As the PDD was finalised in an early moment, not all monitoring devices were already defined. Therefore, the information describing the monitoring of the wastewater flow became outdated after the construction of the project, slightly differing from the initial design. However, the project followed the best practices in the sector for monitoring wastewater treatment system. The water flow measurement is composed by Parshall Flumes equipped with ultrasonic sensor.

The common practice in wastewater treatment to measure the stream inlet and outlet flow is the Parshall Flume, considered an efficient flow meter. Many studies have been developed and are still being developed focusing on this kind of flow meter, which is one of the most used flow meters in Brazil because of its effectiveness, simplicity and relatively low cost. One of the studies that describes the construction and main principles of the Parshall Flume can be found in the Water Measurement Manual, published by the Bureau of Reclamation from the United States Department of the Interior[1].

The State Environmental Agency from Santa Catarina (FATMA - Fundação do Meio Ambiente do Estado de Santa Catarina), which issue the environment licence, fully accepts the monitoring performed by Celulose Irani S.A. as a way to check their compliance with the applicable legislation.

The Parshall Flumes were built in a strong concrete structure, avoiding any deformation of standardized shape, giving a high precision on the relationship between the water height and water flow. The equipment used to measure the water level is an ultrasonic sensor. Important to emphasize that ultrasonic sensor does not measure the flow through the water (thus, transparency, suspended solids, and other substances do not affect the measurement), but just by the water level.

[1] http://www.usbr.gov/pmts/hydraulics_lab/pubs/wmm/

All the flow data is measured by the pack of Parshall Flume and ultrasonic sensor. Given that the effluent is homogeneous (with suspended solids, but homogeneous), the Parshall flumes and Ultrasonic sensor are equipments that represent best practices in the sector. The precision of the equipment pack is of 0.2%, according to the equipment manuals, and is submitted to periodical and regular calibration according Quality Management System of Celulose Irani.

The QA/AC crosscheck procedure in operation is used to check gross error in readings and recording processes. The procedure involves the crosscheck between the wastewater system entrance and exit.

There are Parshall Flumes and ultrasonic sensors in the entrance of wastewater system and in the exit. The entrance equipments are the Parshall Flumes nº 3 and 4, while the exit one is the nº9. The sum of data from Parshall Flumes nº 3 and 4 are taken as reference, and Parshall Flume nº9 is used for crosschecking. Important to notice that the exit measurement is lower than the entrance given numerous facts, such as evaporation of water and generation of sludge (with high water content). The crosscheck of these two data shows that both measurements are in reasonable range (exit varying from 93 top 97% of entrance,).

***(a) the proposed revision of the monitoring plan ensures that the level of accuracy or completeness in the monitoring and verification process is not reduced as a result of the revisions***

The monitoring plan in the PDD did not specify the type of flow meter to be applied and did not define any measurement precision. Given that Parshall Flumes equipped with ultrasonic sensor are common practice in wastewater treatment and have a relative high measurement precision, it is DNV's opinion that the level of accuracy and/or completeness in the monitoring and verification process will not be reduced as a result of the proposed revision.

***(b) the proposed revision of the monitoring plan is in accordance with the approved monitoring methodology applicable to the project activity***

The applied methodology AMS-III.I, version 6, requires, among others, the monitoring of the following data and respective procedures:

"*The amount of COD treated in the wastewater treatment plant shall be measured regularly. The wastewater flow shall be recorded.*"

"*9. The yearly amount of sludge produced (Sy) shall be directly measured by weight or indirectly by its volume and density.(…)*"

The revised monitoring plan continues to measure the inflow of wastewater at the entrance of the treatment system and to weight the amount of sludge produced by the aerobic wastewater treatment system of the "Irani Wastewater Methane Avoidance Project" and is thus in accordance with AMS-III.I (version 06).

***(c) the findings of previous verification reports, if any, have been taken into account***

No verification of emission reductions occurring in the CDM crediting period has been carried out so far.

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