



Verification and certification report form for CDM project activities

(Version 02.1)

Complete this form in accordance with the instructions attached at the end of this form.

VERIFICATION AND CERTIFICATION REPORT

Title and UNFCCC Reference number of the project activity	Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh (10077)
Version number of the verification and certification report	03
Completion date of the verification and certification report	17/07/2019
Monitoring period number and duration of this monitoring period	01, 29/01/2017 – 22/12/2018
Version number of monitoring report to which this report applies	4.0
Crediting period of the project activity corresponding to this monitoring period	29/01/2017-28/01/2027
Project participant(s)	Titas Gas Transmission & Distribution Co. Ltd. (TGTDCCL) NE Climate A/S
Host Party	Bangladesh
Applied methodologies and standardized baselines	AM0023 ver. 4 - Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities
Mandatory sectoral scopes linked to the applied methodologies	10
Conditional sectoral scope(s) linked to the applied methodologies	--
Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD	4,378,506 tCO ₂ e
Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period	3,378,611 tCO ₂ e
Name and UNFCCC reference number of the DOE	TÜV SÜD South Asia Pvt. Ltd (E-0005)

Name, position and signature of the approver of the verification and certification report



Milind Shende

Manager

Certification Body "Environment and Energy"

TUV SUD South Asia

SECTION A. Executive summary

TÜV SÜD South Asia Pvt. Ltd. has performed the 1st verification of the aforementioned CDM project activity. The verification is based on the currently valid documentation of the United Nations Framework Convention on Climate Change (UNFCCC).

The verification process includes three phases:

- Desk review of documents;
- On-site audit and follow-up interviews with the relevant personnel;
- Resolution of outstanding issues and the issuance of final verification report and opinion.

The CDM project has reduced gas leakages from components in the natural gas distribution system in Greater Dhaka and its adjacent areas in the People's Republic of Bangladesh, a Least Developed Country. The length of the natural gas distribution system operated by Titas is 12,253.22 km. Construction began on the distribution system in the mid-1960s and over the years the system has not been adequately maintained. As a result, a significant percentage of the natural gas throughput (predominately methane (CH₄)) leaks from components in the system and is released into the atmosphere contributing to global warming.

The project surveyed 503,974 gas pressure regulation stations across the Titas gas distribution system and identified and repaired 38,092 leaks, leading to emissions reductions of methane, a potent greenhouse gas (GHG).

- Project participants are Titas Gas Transmission & Distribution Co. Ltd. (TGTDCL); NE Climate A/S.
- The project is hosted by Titas Gas Transmission & Distribution Company Ltd. (referred to as "Titas" in this PDD). The company's headquarters are based in Dhaka, Bangladesh with the coordinates of 23.7000°N, 90.3833°E.
- The project has been implemented across Titas' distribution network which covers Greater Dhaka and its adjacent areas, and includes the following twelve regions: Dhaka, Narayanganj, Narsingdi, Munshigonj, Manikgonj, Gazipur, Tangail, Mymensingh, Jamalpur, Sherpur, Netrokona, and Kisoregonj.

6 Corrective Action Requests (CAR) and 1 Clarification Requests (CR) were raised during the course of verification process and have been successfully closed.

SECTION B. Verification team, technical reviewer and approver**B.1. Verification team member**

No	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader and Verifier	IR	Murty	Eswar	TUV SUD	✓	✓	✓	✓

2.	Technical Expert	EI	Joshi	Akhilesh	TUV SUD	✓	✓	✓	✓
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B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer	IR	Meesa	Srikanth	TUV SUD
2	Technical reviewer expert	IR	Shukla	Atul	TUV SUD
3.	Approver	IR	Shende	Milind	TUV SUD

SECTION C. Application of materiality**C.1. Consideration of materiality in planning the verification**

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human errors	Medium	Human error is likely to occur if the monitoring personnel are not trained well or inexperienced in data recording procedures and monitoring processes.	Wherever there is a greater likelihood of errors and chances of incorrect transfer of data, effective data verification should be done on those days/months data. Data related to holiday months need to be checked thoroughly.
2	Design of data management	Medium	Use of spreadsheets without adequate data control, changes/updates, version tracking, traceability and security	Depending on how data is generated, processed, and reported, place greater emphasis on verifying data captured and processed manually and/or in spreadsheets versus those that are generated from an automated system.
3	Manual data	Low	Typographic errors in the spreadsheets and log books while recording.	Require the PPs to assess all the data again and confirm that no further errors are made.

C.2. Consideration of materiality in conducting the verification

The errors identified in the project are below the threshold limit of materiality and hence not material. The GHG emission reductions are calculated without material misstatements.

SECTION D. Means of verification**D.1. Desk/document review**

Publication has been initiated before the verification activities started. Based on the published MR the assessment team performed a desk review to:

- verify the completeness of the data and the information presented in the MR,
- Check the compliance of the MR with respect to the monitoring plan depicted in the registered PDD and verify that the applied methodology was carried out. Particular attention to the frequency of measurements, the quality of the metering equipment including calibration requirements, and the quality assurance and quality control procedures was paid,
- Evaluate the data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions.

The list of all documents reviewed or referenced during the verification is provided in Appendix 2.

D.2. On-site inspection

Duration of on-site inspection: 12/03/2019-14/03/2019				
No.	Activity performed on-site	Site location	Date	Team member
1.	Plant inspection, location of equipment, monitoring of current parameters, risks, project boundaries	PP office Various sites	12/03/2019 - 14/03/2019	Eswar Murty Akhilesh Joshi
2	Verified the technical description, daily and monthly plant records, outage details, evidence documents, trouble shooting procedure			
3	Verified the socio-economic issues, Environmental legislation, Rules and regulations, consent status during monitoring period			
4	Assessed the calibration frequency and status of the monitoring equipments, accuracy label as described in the registered PDD, QA/QC procedures, responsibility, data review and controlling, training of monitoring personal			
5	Assessed the emission reduction procedure and verified the emission reductions excel sheet data with plant records			

D.3. Interviews

No .	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Huque	Asma	Prokaushali Sangsad Ltd (PSL)	12/03/2019 - 14/03/2019	Project design and implementation	Eswar Murty Akhilesh Joshi
2	Ahmed	Tanvir	PSL		Project design and implementation	
3.	James	Kevin	Climate Compass LLC		Monitoring plan and the Practice Project information flow Emission Reduction calculations	
4.	Potapenko	Voladymyr	MBS Ltd		• QA/QC procedures • Personnel training and relevant records • Monitoring instruments and calibration •	
5	Ghosh	Tuhin Shuvra	PSL		Monitoring instruments and calibration	
6	Hussain	Md. Belayat	PSL			
7	Rahaman	Md. Saiful	PSL			
8	Wahab	Md. Abdul	Titas Gas Transmission & Distribution Co. Ltd. (TGTDCL)		Compliance with local laws and regulations	
9	Khan	Md.Kamruzzaman	TGTDCL		Project database and the uncertainties Compliance with local laws and regulations	
10	Mondal	Pradip Chandra	TGTDCL			
11	Ashadudzzaman	Md.	TGTDCL			

D.4. Sampling approach

Since it is not practical to individually verify all 38,092 leaks within the project boundary through on-site inspections, Acceptance Sampling approach was employed by verification team, which follows the “Standard for sampling and survey for CDM project activities and programme of activities”, version 7.0 and “Guidelines for sampling and survey for CDM project activities and programme of activities”, version 4.0.

CDM-VCR-FORM

TUV SUD has taken the "Table 1 Sample Size and Acceptance Number" of the guideline into consideration in order to select a random sample from the PP data, and the AQL of 1%, the UQL of 10%, and the producer's and consumer's risk both at 5% were selected. Therefore, a sample size (n) of 61 should have been verified at least, and accordingly with 2 as the maximum number of discrepancies (acceptance number) between the verified data and the PP data.

However a total number of 69 samples were selected on random basis covering the areas in the boundary.

The list of the samples of leaks verified is provided below.

S.No	Leak code	Address of the Leak
1.	GA-R.3.RR.11.1	Tongi, Moddha Arichpur, Shere Bangla Road, H # 148
2.	GA-R.60.CR.34.1	Tangail, Adi Tangail, Bazit Pur Road, Jahid Molla
3.	MD-4.28.RR.1801.1	Khilkhet, Lake City Concord, Surovi Building
4.	MD-4.28.RR.1832.1	Gulshan, South Badda, H # Ka - 14
5.	MD-4.28.RR.1951.1	Gulshan, South Badda, H # Pa - 16
6.	MD-5.24.RR.2910.1	Mohammadpur, Pc Culture Housing Society, Rd # 10, H # 57/2
7.	MD-5.24.RR.2915.1	Mohammadpur, Adabor, Pc Culture Housing Society, Block - Kha, Rd # 5, H # 9/A & 10/A
8.	MD-5.24.RR.2915.2	Mohammadpur, Adabor, Pc Culture Housing Society, Block - Kha, Rd # 5, H # 9/A & 10/A
9.	MD-5.24.RR.2915.3	Mohammadpur, Adabor, Pc Culture Housing Society, Block - Kha, Rd # 5, H # 9/A & 10/A
10.	MD-3.27.RR.1363.1	Basabo, Shabujbag, Maya Kanon, H # 16/2
11.	MD-3.27.RR.1363.2	Basabo, Shabujbag, Maya Kanon, H # 16/2
12.	MD-3.27.RR.1363.3	Basabo, Shabujbag, Maya Kanon, H # 16/2
13.	NA-J.6.RR.2581.1	Fatullah, Sheyachar, Takkarmath, Block-A, Rd # 3, H # 15, Salauddin
14.	NA-J.6.RR.2581.2	Fatullah, Sheyachar, Takkarmath, Block-A, Rd # 3, H # 15, Salauddin
15.	NA-J.6.RR.2581.3	Fatullah, Sheyachar, Takkarmath, Block-A, Rd # 3, H # 15, Salauddin
16.	NA-J.6.RR.2623.1	Siddhirgonj, Dhankanda, Rd # 4, H # 214
17.	NA-J.6.RR.2623.2	Siddhirgonj, Dhankanda, Rd # 4, H # 214
18.	NA-J.6.RR.2634.1	Siddhirgonj, Godenail, Tatkhana, Boubazar, Block- D, H # 32
19.	NA-J.6.RR.2634.2	Siddhirgonj, Godenail, Tatkhana, Boubazar, Block- D, H # 32
20.	NA-J.6.RR.2639.1	Siddhirgonj, Block-C, Tatkhana Road, Anayet Nagor, H # 147
21.	NA-J.6.RR.2639.2	Siddhirgonj, Block-C, Tatkhana Road, Anayet Nagor, H # 147
22.	MY-H.73.RR.1261.1	Mymensingh, Aqua Morolbari Road, Morolpara, Amdadul Haque Alam
23.	MY-H.73.RR.1261.2	Mymensingh, Aqua Morolbari Road, Morolpara, Amdadul Haque Alam
24.	NA-J.36.RR.5856.1	Gabtolli Road, Songita, Md. Raton Mieah
25.	NA-J.36.RR.5870.1	Gabtolli Road, Ghoradia, Md. Moniruj Jaman
26.	NA-J.36.RR.5870.2	Gabtolli Road, Ghoradia, Md. Moniruj Jaman
27.	NA-J.36.RR.5965.1	Narsingdi, Songita Courasta Bazar, Ghoradia, Abdul Based (Son Sohel)
28.	NA-J.36.RR.5982.1	Narsingdi, Goradia, Gabtali North Para, H # 482, Hosneara
29.	NA-J.36.RR.6044.1	Narsingdi, Hazipur, Moulovipara, Usha Rani Dash (Near By Saiful Chairman House)
30.	NA-J.36.RR.7063.1	Baghata, Moddhopara, Kazi Bari, Mizan
31.	NA-J.36.RR.7063.2	Baghata, Moddhopara, Kazi Bari, Mizan
32.	MD-1.7.RR.1161.1	Kodomtoli, Shampur, High school road, Back side of high school, Tayub ali
33.	MD-1.8.RR.2606.1	Shyampur, Foredabad, Bangladesh Bank Koloni, H # Gha-6
34.	MD-1.8.RR.2621.1	Shyampur, Foredabad, Bangladesh Bank Koloni, H # Ko - 4
35.	MD-1.1.RR.2922.1	Shidhirganj, Rusul Bag, Block # C, Rd # 1/1, H # 74/1, Razzak Bhuyan
36.	MD-1.1.RR.2941.1	Demra, Sarulia, South Tangra, Koborstan Road, H # 12, Salamot ullah

37.	MD-1.1.RR.4128.1	Demra, Dogair, Notun Para, Islambag, Kashem
38.	MD-1.1.RR.4129.2	Demra, Dogair Notun Uttor Para, Baitul Jannat Jame Mossjid Road, Monir Hossain Mollah
39.	GA-R.32.RR.6864.1	Gazipur, Joydebpur, Poschim Bilaspur, Md.Motiur Rahman
40.	GA-R.32.RR.6874.1	Gazipur, Joydebpur, Luxmipura, Paglarmat, Md.Lahazuddin
41.	GA-R.32.RR.6883.1	Gazipur, Joydebpur, Poschim Luxmipura, Md.B.M.Shahi Sekender
42.	GA-R.32.RR.7234.1	Gazipur, Joydebpur, Purbo Chondona, H # 92, Nur Islam Khondokar
43.	MD-4.30.RR.5181.1	Banani, Block-C, Road # 17, H # 15
44.	MD-4.30.RR.5188.1	Banani, International Airport Road, Golf Height Owners Society
45.	MD-1.8.RR.1902.1	Jatrabari,Donia,East dholaipar,Kobirajbag,Abdul Kuddus,H # 661
46.	MD-1.8.RR.1903.1	Jatrabari,Donia,East dholaipar,Kobirajbag,Abdul Mannan, H # 661
47.	MD-1.8.RR.1905.1	Jatrabari,Donia, East dholaipar bazar,Mia bari, H# 668,Advocate Habibur Rahman
48.	MD-1.8.RR.1953.1	Jatrabari, Purbo Dulaipar, 1no Galli, ward # 51, H # 211, Fajlur Rahman
49.	MD-1.8.RR.2006.1	Jatrabari,Donia, Kutubkhali, West Rosulpur Road, H # 242, Hazi Abdul Mozid khan
50.	MD-1.8.RR.2008.1	Jatrabari, Kutubkhali, Mozlish khan Road, H # 234, Abdul Baten
51.	MD-1.8.RR.2059.1	Jatrabari, South Kutubkhali, Mojliskha Road, Ward # 3, H # 126, Md.Mosarof Hosen
52.	NA-J.6.RR.552.2	Narayanganj,Siddhirganj,Ati WapdaColony,BouBazar,H#Usman Goni
53.	NA-J.6.RR.553.1	Narayanganj,Siddhirganj,Ati WapdaColony,BouBazar,D.N.DWapdaColony
54.	NA-J.6.RR.555.1	Narayangong, Siddirgonj,Uttar Ajibpur, Block-B,Rd # 2, H # 48, Nazrul villa
55.	NA-J.6.RR.556.1	Narayangong, Siddirgonj,Uttar Ajibpur, Block-B,Rd # 2, H # Jalal
56.	NA-J.6.RR.557.1	Narayangong, Siddirgonj,Uttar Ajibpur, Block-B,Rd # 2, H # Amir Ali
57.	NA-J.6.RR.557.2	Narayangong, Siddirgonj,Uttar Ajibpur, Block-B,Rd # 2, H # Amir Ali
58.	NA-J.6.RR.559.1	Narayangong, Siddirgonj,Uttar Ajibpur, Block-B,Rd # 2, H # Nur islam
59.	NA-J.6.RR.561.1	Narayangong, Siddirgonj,Uttar Ajibpur, Block-B,Rd # 2, H # Mojammal Haque
60.	NA-J.6.RR.584.1	Narayanganj, Siddhirganj, Omorpur, H # MD.Jahangir
61.	NA-J.6.RR.585.1	Narayanganj, Siddhirganj, Omorpur, H # Abdus Salam
62.	NA-J.6.RR.586.1	Narayanganj, Siddhirganj, Omorpur, H # Mohsin
63.	NA-J.6.RR.587.1	Narayanganj, Siddhirgonj, Godnaile, BE Road, H# Md.Yeakul Zaman
64.	NA-J.6.RR.589.1	Narayanganj, Siddhirgonj, Godnaile, BE Road, H# Abdul Kader
65.	NA-J.6.RR.590.1	Narayanganj, Siddhirgonj, Godnaile, BE Road, H# Abdul Motin
66.	NA-J.6.RR.591.1	Narayanganj, Siddhirgonj, Godnaile, BE Road, H# Nur Alam Hossain
67.	NA-J.6.RR.591.2	Narayanganj, Siddhirgonj, Godnaile, BE Road, H# Nur Alam Hossain
68.	NA-J.6.RR.593.1	Narayanganj, Siddhirgonj, Godnaile, BE Road, H# Abdul Baten
69.	NA-J.6.RR.551.1	Narayanganj,Siddhirganj,Ati WapdaColony,BouBazar,H#Counselor Faruk

D.5. Clarification requests, corrective action requests and forward action requests raised

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form			
Compliance of the project implementation with the registered PDD		02	
Post-registration changes			
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline			
Compliance of monitoring activities with the registered monitoring plan			
Compliance with the calibration frequency		01	

requirements for measuring instruments			
Assessment of data and calculation of emission reductions or net removals	01	03	
Others (please specify)			
Total	01	06	

SECTION E. Verification findings

E.1. Compliance of the monitoring report with the monitoring report form

Means verification	of	TUV SUD has checked the monitoring report provided by the PP against the latest monitoring report form in order to determine, whether the monitoring report is in compliance with it.
Findings		The latest version of MR form available at UNFCCC is 6.0 and same has used by the project proponent in the monitoring report.
Conclusion		TUV SUD confirms that the monitoring report has been prepared on the latest version of the MR available at UNFCCC.

E.2. Remaining forward action requests from validation and/or previous verification

No FAR has been presented, neither in the validation report nor in the previous verification report.

E.3. Compliance of the project implementation with the registered project design document

Means verification	of	This project has reduced methane leaks at above-ground infrastructure in the Titas Gas Transmission & Distribution Co. Ltd. (Titas) gas distribution system. Titas is the managing entity of the gas network under project activity. The project utilized various advanced leak detection equipment to identify leaks throughout the above ground infrastructure of Titas' gas distribution system. The main leak detection and quantification technology used in the project is the "Hi-Flow Sampler" (HFS) which is a machine designed to detect and measure leaks in gas infrastructure. The project has an ongoing monitoring program to ensure leak repairs remain intact. In addition, Titas tracks the continued operation of all the various gas lines across its system. In the case where a particular section of the distribution system is not operational (for example during a large scale repair), the hours during which the system is not operational are tracked. The total hours of operation of all the leaks affected by a given outage are then adjusted to reflect the reduced hours of operation. The Project is funded by NE Climate which is one of the PP, which provides the survey equipment, repair materials, and project transportation for the project. NE Climate has hired Climate Compass as a technical partner to help manage the project implementation and compliance with the approved PDD and methodology. Climate Compass has hired M.B.S as a 3rd party technical consultant to help confirm through regular inspections that the project is compliant with the methodology and PDD. NE Climate has also hired the Dhaka based company Prokaushali Sangsad Limited (PSL), to do much of the project implementation work on a day-to-day basis. The PSL team includes project managers to direct the daily workflow, database managers to ensure the data gathered from the project is recorded correctly, operators in the field who take the appropriate measurements and log the data, and repairmen. Titas Gas also provides
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	several employees who contribute to the database and measurement functions. The roles and responsibilities of each of the above parties are discussed and the respective documentation has been verified by the audit team. The training certificates of the monitoring personnel, calibration team are checked and verified by the audit team The audit team has checked and verified the leaks on a sample basis covering all the areas in the boundary. The collection of data from the leaks, unique numbering and monitoring and repairs of the leaks were verified on site for the selected number of samples. The data has been checked with the plant records.
Findings	CL 1, CAR 1 and CAR 2 have been raised with respect to the implementation and monitoring systems. The errors in the date due to some fault within the HFS has been observed by the audit team during the site visit. The manufacturer is no longer providing spare parts or servicing the equipment, so a repair cannot be made. However, the provision in the methodology which asks for multiple data sources to track all the key data including the date. Photographs, Tags which include date and time and the electronic database have been verified to address this discrepancy. The general description part and the actual implementation status of the project has not been clearly described in the MR. Also the outages are not summarized. The MR has been revised to address this issue. Data flow from collection to CER calculation and different entities and role of entities involved in the CDM monitoring are not captured properly in the MR, hence the CAR was raised. The PP has revised the MR with detailed explanation on the different entities involved in the monitoring with their roles and responsibilities and a flow chart. The data flow from collection to CER calculation has also been addressed in the MR to resolve this issue.
Conclusion	The project is fully implemented according to the description presented in the registered PDD. The verifier confirms, through the visual inspection that all physical features of the CDM project activity including data collecting systems and storage have been implemented in accordance with the registered PDD. The project activity is completely operational and the same has been confirmed during the on-site visit. The operation of the project activity complies with all applicable statutory requirements in Bangladesh. All the equipment and meters have been found installed and operational. There was no diversion from the implementation details given in the registered PDD during this reported monitoring period. The verification team has verified the implementation of the project activity as per VVS PA v2.0 and found to be correct. The project activity has been implemented and operated as stated in the registered PDD which has been verified during the site visit.

E.4. Post-registration changes**E.4.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline**

There are no temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

E.4.2. Corrections

No deviation has been observed from registered monitoring plan or the applied methodology.

E.4.3. Changes to the start date of the crediting period

The start date of the crediting has been changed from 01/04/2015 to 29/01/2017 which was approved by the CDM EB.

E.4.4. Inclusion of a monitoring plan to a registered project activity

No inclusion or changes in the monitoring plan from the registered project activity

E.4.5. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline

No permanent changes found from registered monitoring plan, monitoring methodology or standardized baseline

E.4.6. Changes to the project design of a registered project activity

No changes in the project design from the registered project activity.

E.4.7. Types of changes specific to afforestation and reforestation project activities

Not Applicable as project activity is not afforestation and reforestation project.

E.5. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline

Means of verification	The verification team has checked the actual monitoring plan against the registered monitoring plan and monitoring methodology. Furthermore, the verification team has checked monitoring system during the onsite inspection by means of comparison with the information given in the monitoring plan and monitoring methodology. No applicable tool and standardized baseline involved.
Findings	There is no deviation observed between monitoring plan of the project activity with the monitoring plan of the applied methodology of the project activity.
Conclusion	The monitoring plan complies with the applied methodology and the monitoring system and all applied procedures are completely in compliance to the registered monitoring plan and the methodology. Based on the above observations, the verification team confirms that the registered monitoring plan complied with the approved methodology applied by the registered CDM project activity thus satisfies requirements of VVS PA v2.0.

E.6. Compliance of monitoring activities with the registered monitoring plan**E.6.1. Data and parameters fixed ex ante or at renewal of crediting period**

Means of verification	Data and parameters fixed ex-ante as listed in the monitoring report have been crosschecked and reviewed as applicable against the registered PDD, as well as against the applied methodology and other relevant CDM related documentation and IPCC data. The ex-ante and validated fixed value of GWP for CH₄ has been kept at 25 at the time of registration of PDD.. The conversion factor to convert Nm³ CH₄ to tCH₄ has been fixed ex ante at 0.0007168 and was verified to be correct.
Findings	CAR 06 has been raised since the PP has used the value of GWP for CH ₄ as 28 instead of 25 based on the fifth assessment report of IPCC. However the PP has revised this value as 25 based on IPCC 4 th Assessment report.
Conclusion	EB 69 - Annex 3 states that the GWPs for the second commitment period of the Kyoto Protocol shall be adopted based on decision 4/CMP7 (i.e. those listed in the column entitled "Global Warming Potential for Given Time Horizon" in table 2.14 of the errata to the contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, based on the effects of greenhouse gases over a 100-year time horizon). Accordingly the value of 25 has been used in the MR. TÜV SÜD confirms that PP has correctly mentioned the ex-ante parameters in the monitoring report in line with the registered PDD, IPCC data and the applied monitoring methodology. Furthermore, it is confirmed that PP has correctly applied the values that were traced to their respective sources and found correct.

E.6.2. Data and parameters monitored

Means of verification	The verification of the parameters required by the monitoring plan is provided as follows: <table border="1"> <tr> <td>Data / Parameter:</td><td>T_{j,y}</td></tr> <tr> <td>Data unit:</td><td>Hours</td></tr> <tr> <td>Description:</td><td>The time the relevant component, in which physical leak j, occurred, would leak in the baseline scenario and would be eligible for crediting during the crediting year y (hours)</td></tr> <tr> <td>Source of data used:</td><td>Titas operational logs</td></tr> <tr> <td>Means of verification/Comments:</td><td>The recording of hours has been verified from the complete data for each leak j, in the baseline scenario and also from the shutdown records.</td></tr> <tr> <td>Cross-check</td><td>---</td></tr> </table> <table border="1"> <tr> <td>Data / Parameter:</td><td>T_z</td></tr> <tr> <td>Data unit:</td><td>Hours</td></tr> </table>	Data / Parameter:	T_{j,y}	Data unit:	Hours	Description:	The time the relevant component, in which physical leak j, occurred, would leak in the baseline scenario and would be eligible for crediting during the crediting year y (hours)	Source of data used:	Titas operational logs	Means of verification/Comments:	The recording of hours has been verified from the complete data for each leak j, in the baseline scenario and also from the shutdown records.	Cross-check	---	Data / Parameter:	T_z	Data unit:	Hours
Data / Parameter:	T_{j,y}																
Data unit:	Hours																
Description:	The time the relevant component, in which physical leak j, occurred, would leak in the baseline scenario and would be eligible for crediting during the crediting year y (hours)																
Source of data used:	Titas operational logs																
Means of verification/Comments:	The recording of hours has been verified from the complete data for each leak j, in the baseline scenario and also from the shutdown records.																
Cross-check	---																
Data / Parameter:	T_z																
Data unit:	Hours																

Description:	The time (in hours) the relevant component has been leaking during the crediting year y
Source of data used:	Titas operational logs
Means of verification/Comments:	The recording of hours has been verified from the complete data for each leak z, in the monitoring period and also from the shutdown records.
Cross-check	---

Data / Parameter:	Temperature and pressure of natural gas
Data unit:	°C and bar
Description:	Conditions observed at the point and time of the leak rate measurement
Source of data used:	Hi Flow Sampler
Means of verification/Comments:	The Hi-Flow™ Sampler automatically adjusts readings to standard temperature and pressure (0°C and 101.3 kPa) and this is reflected in the machine's margin of error and are integrated into the results from the hi-Flow sampler device. The audit team has verified the sample leaks from the HFS and the temperature and pressure readings were observed for the respective leak.
Cross-check	--

Data / Parameter:	UR_j
Data unit:	Fraction
Description:	The uncertainty range for the measurement method applied to leak j
Source of data used:	The manufacturer's documented margin of error ±10% per measurement and the data of each measurement.
Means of verification/Comments:	The uncertainty data is calculated using leakage flow rates and the respective UR of the Hi-Flow sampler used for the leak. The uncertainty calculations are included in the CER calculations spreadsheet and the same have been checked by the audit team for all the leaks.
Cross-check	--

Data / Parameter:	UR_z
Data unit:	Fraction
Description:	The uncertainty range for the measurement method applied to leak z
Source of data used:	The manufacturer's documented margin of error ±10% per measurement and the data of each measurement.

	Means of verification/C omments:	The uncertainty data is calculated using leakage flow rates and the respective UR of the Hi-Flow sampler used for the leak. The uncertainty calculations are included in the CER calculations spreadsheet and the same have been checked by the audit team for all the leaks.
	Cross-check	--
	Data / Parameter:	F_{CH4, j}/F_{CH4, z}
	Data unit:	m ³ CH ₄ /h
	Description:	The leak flow rate of methane for leak (j, z) from the leaking component
	Source of data used:	Hi-Flow™ sampler readings
	Means of verification/C omments:	Measurements with Hi-Flow™ Sampler are automatically adjusted to the methane content, temperature and pressure and, thus, will directly yield methane leak flow rates. The audit team has verified the leak flow rate of methane for leak j and z from the complete data for the leaks.
	Cross-check	--
	Data / Parameter:	BE_{CAP}
	Data unit:	tCO ₂ e
	Description:	Capped quantity of the baseline emissions, defined as the baseline emissions for the first year of the crediting period
	Source of data used:	Monitored baseline emissions during the first year of the first crediting period
	Means of verification/C omments:	Capped quantity as per the methodology
	Cross-check	--
Findings	CAR 4 has been raised with respect to the monitoring of parameters. The value of Uncertainty reported in the MR was not matching with the CER calculation sheet. The value of capped baseline emissions are also not mentioned in the MR. PP has subsequently revised the MR making the necessary changes.	
Conclusion	The monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD. All parameters were monitored and determined as per the registered monitoring plan. Referring to the VVS PA v2.0, DOE confirms through on-site verification and from the document review, the actual monitoring system complies with the registered monitoring plan. The substantiation of this conformity on information flow for these parameters including the values in the monitoring reports is reported in the above During the verification, all relevant monitoring parameters of the registered monitoring plan have been verified with regard to the appropriateness of the	

	verification method, the correctness of the values applied for ER calculation, the accuracy and applied QA/QC measures. After appropriate corrections, carried out by the project participant, it is confirmed that all monitoring parameters have been measured / determined without material misstatements and are in line with all applicable standards and relevant requirements. All parameters required to be monitored are recorded at the intervals required by the registered monitoring plan and the applied methodology. On the basis of review of source and nature of available evidences and records, the verification team confirms the quality of evidence for emission reduction provided is sufficient as per VVS PA v2.0
--	---

E.6.3. Implementation of sampling plan

Means verification	of	Not Applicable. Project participants did not apply a sampling approach for the determination of data and parameters monitored.
Findings		Not Applicable
Conclusion		Not Applicable

E.7. Compliance with the calibration frequency requirements for measuring instruments

Means verification	of	The audit team has checked the calibration certificates and records of the monitoring equipment as given below: The calibration is done as per the Hi-Flow Sampler manual which suggests a 30 day calibration period by certified staff. Serial Numbers of the Hi-Flow Samplers used in this project and dates of calibration: NQ 1000: 29/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 04/08/2017, 06/09/2017, 04/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018 NQ 1001: 23/04/2016, 21/05/2016, 15/08/2016, 19/09/2016, 13/10/2016, 29/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 04/08/2017, 06/09/2017, 04/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018 NQ 1002: 23/04/2016, 21/05/2016, 15/08/2016, 19/09/2016, 13/10/2016, 03/03/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 05/08/2017, 06/09/2017, 03/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018 NQ 1003: 23/04/2016, 21/05/2016, 15/08/2016, 19/09/2016, 13/10/2016, : 29/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 04/08/2017, 06/09/2017, 04/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018 NQ 1005 29/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 04/08/2017, 06/09/2017, 04/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018
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	NQ 1007: 23/04/2016, 21/05/2016, 15/08/2016, 19/09/2016, 13/10/2016, 29/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 04/08/2017, 06/09/2017, 04/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018 NQ 1008: 27/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 04/08/2017, 06/09/2017, 04/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018 NQ 1009 29/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 05/08/2017, 06/09/2017, 03/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018 NQ 1011 23/04/2016, 21/05/2016, 15/08/2016, 19/09/2016, 13/10/2016, 29/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 04/08/2017, 06/09/2017, 04/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018 16020932: 29/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 05/08/2017, 06/09/2017, 03/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018, 15/02/2018, 15/03/2018, 12/04/2018, 13/05/2018, 24/06/2018, 24/07/2018, 28/08/2018, 28/09/2018, 25/10/2018, 5/11/2018 16020933: 29/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 04/08/2017, 06/09/2017, 04/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018, 15/02/2018, 15/03/2018, 12/04/2018, 13/05/2018, 28/08/2018, 28/09/2018, 25/10/2018, 5/11/2018 16020936: 29/11/2016, 24/12/2016, 20/01/2017, 17/02/2017, 17/03/2017, 13/04/2017, 11/05/2017, 09/06/2017, 07/07/2017, 04/08/2017, 06/09/2017, 04/10/2017, 27/10/2017, 24/11/2017, 22/12/2017, 19/01/2018, 15/02/2018, 15/03/2018, 12/04/2018, 13/05/2018, 24/06/2018, 24/07/2018, 28/08/2018, 27/09/2018, 25/10/2018, 5/11/2018 The period where there is a deviation in the 30 day calibration period indicates that the monitoring has not been carried out during that particular period. The PP has ensured that at the time of monitoring, the HFS used has been calibrated in line with the specifications of the manual. No measurements during this monitoring period were taken by an HFS outside the manufacturers recommended calibration schedule. In the case where the Hi-Flow Sampler fell out of calibration, it remained unused during the impacted period. The Calibration has been performed by the certified staff and the documents regarding the same have been verified by the audit team.
Findings	CAR 3 has been raised since the total number of HFS used in the

	verification along with the calibration dates are not provided in the MR. The audit team has checked the HFS that are used and the same have been updated by PP.
Conclusion	According to VVS PA v2.0, verification team has checked calibration records to confirm it has been conducted as the frequency specified in the registered monitoring plan.

E.8. Assessment of data and calculation of emission reductions or net removals

E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

Means of verification	The assessment of data and the calculation of baseline emission reduction in the MR and the CER excel sheet have been verified in accordance with the formulae as per the methodology.
Findings	CAR 5 has been raised since the calculation procedure of baseline emissions are not described in the MR. The PP has revised the MR to include the calculation methods.
Conclusion	The calculation of baseline emissions is correct. Further the information provided in the monitoring report has been cross-checked with other sources such as plant logbooks, inventories, purchase records and laboratory analysis to confirm the correctness and for plausibility check. The calculation of baseline GHG emissions have been carried out in accordance with the formulae and methods described in the registered monitoring plan and the applied methodology. Any assumptions used in emission or removal calculations have been justified. Appropriate emission factor, IPCC default values, GWPs and other reference values have been correctly applied. The verification team also confirms that there is no material misstatement in the calculation of reported baseline emissions.

E.8.2. Calculation of project GHG emissions or actual net GHG removals by sinks

Means of verification	Not Applicable
Findings	Not Applicable
Conclusion	Not Applicable

E.8.3. Calculation of leakage GHG emissions

Means of verification	Not Applicable
Findings	Not Applicable
Conclusion	Not Applicable

E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks

Means of verification	No lack of evidence and missing data were detected during this monitoring period. All values as per the monitoring plan were crosschecked by the verification team against basic monitored data and the calculations were found to be correct. The verification team confirms that all assumptions, emission factors and default values have been correctly justified. All the emission factors, application of maximum permissible errors and default values are explicitly mentioned in the
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	monitoring report. Hence the DOE confirms that the methods and formulae used to obtain the emissions are appropriate. No reporting risks have been identified for the data reported. Troubleshooting procedure, maintenance and calibration of monitoring equipments, monitoring measurements and reporting, record handling and maintenance, reviewing monitored data are available at the plant. All the monitored data are archived partially in electronic and paper form. The data will be kept for the whole crediting period and 2 years after the last crediting period thereby meeting the requirement of the monitoring plan. Verified emission reductions in this monitoring period: 3,378,611 tCO₂e Baseline: 3,378,611 tCO₂e Project emissions: 0 tCO₂e Leakage: 0 tCO₂e
Findings	No CL/CAR has been raised.
Conclusion	The verification team confirms that the emission reductions are real and measurable. The verification team also confirms that there is no material misstatement in the calculation of reported emission reductions. The calculations of baseline emissions, project emissions and leakage as appropriate have been carried out in accordance with the formulae and methods described in the registered monitoring plan and the applied methodology document. TUV SUD confirms that all assumptions, emission factors and default values have been correctly justified. All the emission factors and default values are explicitly mentioned in the monitoring report. Calculations, applied formulae and method for calculation of GHG emission are in accordance with the registered monitoring plan and are in line with the requirements of the applied methodology.

E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD

Means of verification	TUV SUD compared the ex-ante estimation of emission reductions in the registered PDD with the emission reductions reported by the PPs in the monitoring report.
Findings	The estimated CERs for this monitoring period are 4,378,506 tCO ₂ e however during this monitoring period the reported CERs are 3,378,611 tCO ₂ e. This clearly demonstrates that the reported emission reductions resulted lower than that estimated in the CDM-PDD. The reason behind low emission reduction is less operating days of the plant
Conclusion	TUV SUD confirms that the emission reductions are real and measurable.

E.8.6. Remarks on difference from estimated value in registered PDD

Means of verification	TUV SUD compared the ex-ante estimation of emission reductions in the registered PDD with the emission reductions reported by the PPs in the monitoring report.
Findings	The emission reduction amount of present monitoring period is lower than the estimated in the registered PDD.
Conclusion	TUV SUD confirms that the emission reductions are real and measurable.

E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

Means of verification	The reported GHG emission reductions reported in the monitoring report are 3,378,611 tCO ₂ e (from 1 st January 2013 onwards). As described in detail in Section E of this report, all relevant aspects of the project activity have been assessed in order to determine, whether the claimed emission reductions by the PPs are correctly determined, reasonable and fairly stated and based on verifiable evidence and in accordance with the applied methodology, the registered PDD.
Findings	No CL/CAR has been raised.
Conclusion	TUV SUD confirms that the GHG emission reduction of the present monitoring period is 3,378,611 tCO ₂ e. TUV SUD confirms that the GHG emission reductions reported in the monitoring report and claimed by the PPs are correctly determined and reported. This is acceptable

E.9. Assessment of reported sustainable development co-benefits

Means of verification	NA
Findings	NA
Conclusion	NA

E.10. Global stakeholder consultation

Means of verification	No comments were received during Global stakeholder consultation.
Findings	NA
Conclusion	NA

SECTION F. Internal quality control

Internal quality control within the team is assured by means of a technical review process that takes place after the on-site assessment and after closure of findings. The internal quality control in the verification process is given by the final decision (Verification and Certification Conclusion) made by the Certification Body.

SECTION G. Verification opinion

The DOE confirms that

- the development and maintenance of records and reporting procedures are in accordance with the registered monitoring plan;
- the project is operated as planned and described in the project design document approved by the EB;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- the monitoring system is in place and generates GHG emission reductions data;
- the monitoring plan in Monitoring Report is as per the PDD and monitoring plan approved by the EB;
- the approved monitoring plan in the approved PDD is as per the applied methodology;
- There is an audit trail that contains the evidence and records that validate the stated figures.

Based on the information we have seen and evaluated, we confirm that the project activity achieved the verified amount of reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the project activity.

Verified emission reductions in this monitoring period: 3,378,611 tCO₂e

Baseline: 3,378,611 tCO₂e

Project emissions: 0 tCO₂e

Leakage: 0 tCO₂e

It is the opinion of TUV SUD that the amount of GHG emission reductions achieved by the project activity during this monitoring period is correct and that it complies with all applicable CDM requirements.

SECTION H. Certification statement

TÜV SÜD South Asia Pvt. Ltd. has performed the periodic verification CDM project activity "Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh". The verification is based on the currently valid documentation of the United Nations Framework Convention on Climate Change (UNFCCC).

The management of NE Climate A/S and Titas Gas Transmission & Distribution Co. Ltd. Are responsible for the preparation of the GHG emissions data and the reported GHG emission reductions on the basis set out within the project's Monitoring Plan indicated in the registered PDD and the applied methodology

TUV SUD conducted the verification on the basis of the monitoring methodology "AM0023 ver. 4 - Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities", registered PDD, validation report and the monitoring report (version 04) dated 16/07/2019 , emission reduction spreadsheets and all the supporting documentation made available to us.

TÜV SUD confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have assessed, we confirm that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner.

Pune, 17/07/2019



Milind Shende

Certification Body "Environment and Energy"
TÜV SÜD South Asia

Appendix 1: Abbreviations

Abbreviations	Full texts
ACM	Approved Consolidated Methodology
AQL	Acceptable Quality Level
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board
CER	Certified Emission Reduction
CM	Combined Margin
CMP	Conference of the Parties serving as the Meeting of the Parties to the Kyoto Protocol
CO ₂ e	Carbon dioxide equivalent
CR / CL	Clarification Request
DNA	Designated National Authority
DOE	Designated Operational Entity
EF	Emission Factor
ER	Emission Reduction
FAR	Forward Action Request
GHG	Greenhouse Gas(es)
GWP	Global Warming Potential
HFS	Hi Flow Sampler
KP	Kyoto Protocol
MP	Monitoring Plan
MR	Monitoring Report
PCP	Project Cycle Procedure
PDD	Project Design Document
PP	Project Participant
PS	Project Standard
PSL	Prokaushali Sangsad Limited
TÜV SÜD	TÜV SÜD South Asia Pvt. Ltd
TGTDCL	Titans Gas Transmission & Distribution Co. Ltd
UNFCCC	United Nations Framework Convention on Climate Change
UQL	Unacceptable Quality Level
VVS	Clean Development Mechanism Validation And Verification Standard for PA v2.0

Appendix 2. Competence of team members and technical reviewers



South Asia

CERTIFICATE OF APPOINTMENT

Mr. Murty, Eswar fulfills the requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd to participate in audits.

Qualification applicable to					
Standard	CDM	GS	VCS	ISO-14064-1: 2006	Other
	☒	☒	☒	☒	☐

Qualification as						
Status	Validator	Verifier	ATL	Technical Reviewer	Financial Expert	Technical Expert
	☒	☒	☒	☒	☒	☒
TA (s)	1.1, 1.2, 3.1, 4.1, 13.1					

Country Expertise						
Region	1	2	3	4	5	Other
	☒	☐	☐	☐	☐	
Further countries						

Technical Area	
1.1_Thermal Energy Generation	
1.2_Renewables	
3.1_Energy demand	
4.1_Cement and lime production	
13.1_Solid waste and wastewater	

This appointment is valid until 31.05.2020 and is bound by internal requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd.

In case of loss of validity of this certificate as per result of an assessment according to internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference no. CB-IND-CCP-0031/010.

Date	Signature
01/05/2019	

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South Asia

CERTIFICATE OF APPOINTMENT

Mr. Joshi, Akhilesh fulfills the requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd to participate in audits.

Qualification applicable to					
Standard	CDM	GS	VCS	ISO-14064-1: 2006	Other
	☒	☒	☒	☐	☐

Qualification as						
Status	Validator	Verifier	ATL	Technical Reviewer	Financial Expert	Technical Expert
	☒	☒	☐	☐	☐	☒
TA (s)	1.2, 3.1, 4.1, 10.1					

Country Expertise						
Region	1	2	3	4	5	Other
	☒	☐	☐	☐	☐	
Further countries						

Technical Area
1.2_Renewables
3.1_Energy demand
4.1_Cement and lime production
10.1_Fugitive emissions from oil and gas

This appointment is valid until 31.12.2019 and is bound by internal requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd.

In case of loss of validity of this certificate as per result of an assessment according to internal procedures or due to any other reason, it will be properly communicated to you.

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Date	Signature
01/06/2018	

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South Asia

CERTIFICATE OF APPOINTMENT

Mr. Meesa, Srikanth fulfills the requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd to participate in audits.

Qualification applicable to					
Standard	CDM	GS	VCS	ISO-14064-1: 2006	Other
	☒	☒	☒	☒	☐

Qualification as						
Status	Validator	Verifier	ATL	Technical Reviewer	Financial Expert	Technical Expert
	☒	☒	☐	☒	☐	☒
TA (s)	1.2, 3.1, 7.1, 13.1					

Country Expertise						
Region	1	2	3	4	5	Other
	☒	☐	☐	☐	☐	
Further countries						

Technical Area
1.2_Renewables
3.1_Energy demand
7.1_Transport
13.1_Solid waste and wastewater

This appointment is valid until 31.05.2020 and is bound by internal requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd.

In case of loss of validity of this certificate as per result of an assessment according to internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference no. CB-IND-CCP-0096/006.

Date	Signature
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South Asia

CERTIFICATE OF APPOINTMENT

Mr. Shukla, Atul fulfills the requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd to participate in audits.

Qualification applicable to					
Standard	CDM	GS	VCS	ISO-14064-1: 2006	Other
	☒	☒	☒	☐	☐

Qualification as						
Status	Validator	Verifier	ATL	Technical Reviewer	Financial Expert	Technical Expert
	☐	☐	☐	☐	☐	☒
TA (s)	1.1, 10.1					

Country Expertise						
Region	1	2	3	4	5	Other
	☒	☐	☐	☐	☐	
Further countries						

Technical Area
1.1_Thermal energy generation
10.1_Fugitive emissions from oil and gas

This appointment is valid until 31.05.2020 and is bound by internal requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd.

In case of loss of validity of this certificate as per result of an assessment according to internal procedures or due to any other reason, it will be properly communicated to you.

Your Certificate has the internal reference no. CB-IND-CCP-0009/009.

Date	Signature
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Appendix 3. Documents reviewed or referenced

No	Author	Title	References to the document	Provider
1	UNFCCC	https://cdm.unfccc.int/Projects/DB/TUEV-RHEIN1418008670.0/view	-	
2	UNFCCC	AM0023 ver. 4 - Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities	Version 4	
3	NE Climate	Published Monitoring Report	Version.01, Dated 15/01/2019	
4	NE Climate	Registered PDD	Version 6, 16/03/2015	
5	NE Climate	Final Monitoring Report	Version 4 dated 16/07/2019	
6	NE Climate	Hi Flow Sampler Calibration log book	29/01/2017 – 22/12/2018	
7	NE Climate	List of issues during calibration of Hi Flow Sampler	29/01/2017 – 22/12/2018	
8	NE Climate	Error list of Hi Flow Sampler	29/01/2017 – 22/12/2018	
9	Titas Gas	Declaration on the replacement of leaks	25/01/2019	
10	PSL	Statement regarding provision of materials	17/01/2019	
11	PSL	Statement regarding leak detection and measurement team	17/01/2019	
12	Bacharach	Manual for Hi Flow Sampler	May 2005	
13	Titas Gas	Statement regarding disconnections	23/01/2019	
14	Titas Gas	Statement regarding the team members and their responsibilities from Titas Gas	25/01/2019	
15	MBS	Training course completion certificate on Hi Flow Sampler for 37 nos. of operators and managers	29/11/2016	
15	MBS	Confirmation of technical skills of PSL and Titas Gas managers to use Hi flow Samplers and Monitoring systems	25/12/2016	
16	MBS	Confirmation of the visits by MBS personnel for training, inspection, support to data collection and calibration process	09/02/2018-13/12/2018	
17	NE Climate	CER calculation spreadsheet for the total leak monitoring including outages	29/01/2017 – 22/12/2018	
18	Titas Gas/PSL	On field leak data tag/ card to record the data- consisting of Leak code, Date, Operator	29/01/2017 – 22/12/2018	

		name, Leak rate. Type of leak, Date of Initial repair, Name of repairmen, Leak rate after repairing, Monitoring date of leak		
19	Titas Gas/PSL	Log book data of all leaks before repair and during monitoring	29/01/2017 – 22/12/2018	
20	Titas Gas/PSL	Detailed log sheets of all leaks with leak code, photographs and GPS coordinates	29/01/2017 – 22/12/2018	

Appendix 4. Clarification requests, corrective action requests and forward action requests

Table 1. Remaining FAR from validation and/or previous verifications

NA.

Table 2. CL from this verification

CL ID	01	Section no.		Date: 17/03/2019
Description of CL				
The errors in HFS data needs to be justified by the PP.				
Project participant response				Date: 20/03/2019
The errors in date are predominately caused by a fault in the date/time chip within the HFS. Unfortunately, the HFS is no longer sold so a replacement cannot be purchased. The manufacturer is no longer providing spare parts or servicing the equipment so a repair cannot be made. Unfortunately there is nothing that can be done to directly correct the problem with the machines. Fortunately, the error in the year that is in the electronic download from the HFS is easy to recognize and is immediately included in an error log that documents the corrupt data and the actual data. This record serves as an additional source for data to be cross checked. Also, the methodology envisages just this type of problem where one data source is lost or corrupted. The methodology asks for multiple data sources to track all the key data including the date. Even though the year is incorrect in the data files from a few HFS, the date is correct on the hard copy form that is produced for ever leak by the operator who finds and measures the leaks. The correct information can also be found in the electronic database that includes the data input by the operators after returning from the field. Additionally, photos are taken of the leak site, measurements, and tags. The tags, including the date are left at the location of each leak and are checked during each monitoring. Therefore, despite the inconvenience of several HFS not downloading the correct date, it is certain that there is no impact from the error on the accuracy of the calculations of CERs and this can be easily cross-checked using any one of the several redundant sources of information available as per the methodology. In addition, going forward, the project will look to use whenever possible HFS machines that do not have this fault for future monitoring events.				
Documentation provided by project participant				
Revised MR with more detailed explanation.				
DOE assessment				Date: 16/05/2019
The errors in the date due to some fault within the HFS has been observed by the audit team during the site visit. The manufacturer is no longer providing spare parts or servicing the equipment so a repair cannot be made. However, the provision in the methodology which asks for multiple data sources to track all the key data including the date. Photographs, Tags which include date and time and the electronic database have been verified to address this discrepancy. Hence the issue is closed.				

Table 3. CAR from this verification

CAR ID	01	Section no.		Date: 17/03/2019
Description of CAR				
1. General description could be revised based on the actual status as the project is already registered. The actual status could be based on the number of leaks monitored etc				
2. Outages to be summarized under Implementation part B.1				
Project participant response				Date: 20/03/2019
The general description in A.1 has been revised. And outages have been summarized in part B.1				
Documentation provided by project participant				
Revised MR.				
DOE assessment				Date: 16/05/2019
The PP has made the necessary changes. Hence the issue is closed.				

CAR ID	02	Section no.		Date: 17/03/2019
Description of CAR				
Data flow from collection to CER calculation and different entities and role of entities involved in the CDM monitoring- Section C could be revised.				
Project participant response				Date: 20/03/2019
An additional summary of roles was added along with a flow-chart delineating the data flow from data collection to CER calculation.				
Documentation provided by project participant				
Revised MR				
DOE assessment				Date: 16/05/2019
The PP has made the necessary changes. Hence the issue is closed.				

CAR ID	03	Section no.		Date: 17/03/2019
Description of CAR				
It needs to be indicated in the MR the total number of HFS used along with the serial numbers and dates of calibration.				
Project participant response				Date: 20/03/2019
The list of HFS including serial numbers and dates of calibration have been included in the MR and are also in the Calibration log book already provided.				
Documentation provided by project participant				
Revised MR				
DOE assessment				Date: 16/05/2019
The details of HFS calibration are included in the MR. Hence the issue is closed.				

CAR ID	04	Section no.		Date: 17/03/2019
Description of CAR				
1. The value of uncertainty mentioned in MR is not matching with the calculation sheet.				
2. Value of BEcap could be mentioned in the MR and those parameters not monitored could be marked as NA				

Project participant response	Date: 20/03/2019
The error in the MR concerning the Uncertainty value has been corrected in the MR. The value included in the MR now matches the calculation sheet. The value of BEcap has been included. Those parameters not monitored are marked as NA.	
Documentation provided by project participant	
Revised MR	
DOE assessment	Date: 16/05/2019
The PP has made the necessary corrections. Hence the issue is closed.	

CAR ID	05	Section no.		Date: 17/03/2019
Description of CAR				
The calculation procedure of baseline emissions could be mentioned under sec E4.				
Project participant response				Date: 20/03/2019
The calculation procedure of the baseline emissions is mentioned under section E4.				
Documentation provided by project participant				
Revised MR				
DOE assessment				Date: 16/05/2019
Hence the issue is closed.				

CAR ID	06	Section no.		Date: 12/07/2019
Description of CAR				
The global warming potential (GWP) of the methane adopted to calculate emission reductions was equal to 28 tCO ₂ e/tCH ₄ , whereas EB 69 - Annex 3 states that the GWPs for the second commitment period of the Kyoto Protocol shall be adopted based on decision 4/CMP7 (i.e. those listed in the column entitled "Global Warming Potential for Given Time Horizon" in table 2.14 of the errata to the contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, based on the effects of greenhouse gases over a 100-year time horizon). PP to check and revise the documents.				
Project participant response				Date: 16/07/2019
The MR and calculation sheets have been revised to include the GWP value of CH ₄ as 25 in line with the IPCC 4 th Assessment Report.				
Documentation provided by project participant				
Revised MR				
DOE assessment				Date: 16/07/2019
Hence the issue is closed.				

Table 4. FAR from this verification

NA.