



**Verification and certification report form for
CDM project activities
(Version 04.0)**

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

BASIC INFORMATION

Title and UNFCCC reference number of the project activity	Reducing Gas Leakages within the Titas Gas Distribution Network in Bangladesh (10077)		
Scale of the project activity	☒ Large-scale ☐ Small-scale		
Version number of the verification and certification report	3.0		
Completion date of the verification and certification report	21/07/2021		
Monitoring period number and duration of this monitoring period	3, 08/11/2019 - 31/12/2020		
Version number of the monitoring report to which this report applies	4		
Crediting period of the project activity corresponding to this monitoring period	29/01/2017- 28/01/2027		
Project participants	Titas Gas Transmission & Distribution Co. Ltd. (TGTDCCL); NE Climate A/S		
Host Party	People's Republic of Bangladesh		
Applied methodologies and standardized baselines	AM0023 (Version 04.0.0)- Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities Standardized baseline: NA		
Mandatory sectoral scopes	10. Fugitive emissions from fuels (solid, oil and gas)		
Conditional sectoral scopes, if applicable	N.A		
Estimated amount of GHG emission reductions or GHG removals for this monitoring duration in the registered PDD	4,049,551 tCO ₂ e		
Certified amount of GHG emission reductions or GHG removals for this monitoring period	Amount before 1 January 2013	Amount from 1 January 2013 until 31 December 2020	Amount from 1 January 2021
	0	4,049,551	0
Name and UNFCCC reference number of the DOE	TÜV SÜD South Asia Private Limited (TÜV SÜD)-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 Pvt Ltd.

Pune, India

SECTION A. Executive summary

TÜV SÜD South Asia Pvt. Ltd. has performed the 3rd 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 has 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). There are 37,911 leak repairs in the database and 34,826 leak repairs that were monitored during this period.

- 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.

2 Corrective Action Requests (CAR) and 3 Clarification Requests (CLs) were raised during the course of verification process and have been successfully closed. No Forward Action Request (FAR) has been raised.

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 & Verifier	IR	Murty	Eswar	TUV SUD South Asia	✓		✓	✓
2	Technical	IR	Shukla	Atul	TUV SUD	✓		✓	✓

	Expert (10.1)				South Asia				
3	Country Expert (Bangladesh)	EI	Khalil	Md Mobassir	TUV SUD Bangladesh	✓		✓	

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	EI	Meesa	Srikanth	TUV SUD South Asia
2	Technical Expert (10.1)	EI	Chandra	Manish	TUV SUD South Asia
3	Approver	IR	Shende	Milind	TUV SUD South Asia

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 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 was paid to the frequency of measurements, the quality of the metering equipment including calibration requirements, and the quality assurance and quality control procedures.,
- 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.

D.2. On-site inspection

The DOE has conducted the remote audit for this current monitoring period, which is the third verification of this project activity, due to the Covid-19 pandemic and the ongoing travel restrictions outside the country. The audit team leader could not conduct the verification audit in the host country due to the Covid-19 pandemic. This has been done as per the decision taken by CDM-EB on 20 March 2020 and subsequent extension of these alternative measures until 30 June 2021 as per p.28 EB 108. However, the DOE has made use of the local staff in the host country Bangladesh, to conduct the DOE sampling part of the leaks, and the verification audit with the PP has been conducted remotely as per the justification provided below:

CDM-EB Guidance	Justification by DOE
If the site visits cannot be postponed, a proper justification should be provided by the DOE why the site visits cannot be postponed, including the demonstration of a significant impact of delaying the site visits on the DOE, or project participants or coordinating/ managing entity (e.g. commitment/ timeline as per the validation or verification contract, CER delivery commitment by project participants) reliance on applicable force majeure provisions in the validation or verification contracts, if needed.	It was checked by the audit team that as per the Transaction Confirmation for Carbon Credit transactions signed by the PP with the buyer, timeline for delivery of CERs to buyer is by the end of second quarter 2021. Since the MR has been published on 16 th February 2021, it was not possible to meet the CER delivery commitment from PP by postponing the site visits. Hence the site visits could not be postponed.
If the site visit cannot be postponed but are not conducted due to the COVID-19 pandemic, the DOE may use other standard auditing techniques for validation or verification, as referred to in sections 7.1.3 and 9.1.3 of the VVS-PA and sections 7.1.3 and 10.1.3 of the VVS-PoA. In the above regard, the Board agrees to allow for three months, from 23 March to 23 June 2020, to deviate from the requirements in paragraphs 30 and 339 of the VVS-PA and paragraphs 183 and 321 of the VVS-POA. Where the DOE relies on this temporary measure, it shall describe in the validation/ verification report the alternative means used and justify that they are credible and sufficient for the purpose of validation or verification.	The DOE has used other standard auditing techniques for verification, as referred to in section 9.1.3 of the CDM VVS-PA v2.0. Since an onsite inspection is avoided, the verification team decided to carry out the audit by other means of standard auditing techniques, which included video conference calls, photographs and videos of the site, monitoring equipment installed and measuring devices in place, raw data and interviews. The DOE has conducted sampling by making use of local staff.

The DOE has conducted web meetings and video conference with PP and their representatives on 10th and 11th March 2021. The interviews and discussions were conducted successfully, and it is sufficient for the DOE to verify and prepare the report, in line with p.322 of the CDM VVS PA v2.0.

PART II.

The DOE has conducted acceptance sampling on 11th March 2021, which has been explained under section D.4 below.

D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Ahmed	Tanvir	Prokaushali Sangsad Ltd (PSL)	10/03/2021 11/03/2021	Project design and implementation	Eswar Murty
2	James	Kevin	Climate Compass LLC		Project design and Implementation Monitoring plan and the Practice Project information flow Emission Reduction calculations	Atul Shukla
3.	Potapenko	Voladymyr	MBS Ltd		• QA/QC procedures • Personnel training and relevant records • Monitoring instruments and calibration	Mobassir Khalil
4.	Ghosh	Tuhin Shuvra	PSL		Project design and implementation	
5	Ashadudzzaman	Md.	TGTDCL		Project database and the uncertainties Compliance with local laws and regulations	

D.4 Sampling approach

Since it is not practical to individually verify all 34,476 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 8.0.

TUV SUD has taken the “Table 2 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 62 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	GPS	Address	Date of monitoring by Titas	Date of Verification TUV SUD	Leak observed (Y/N)
1	MD-1.1.RR.1029.1	23° 43' 55.4" N 90° 29' 45.3" E	Demra, Demra Bridge Songlogno Bazar Road, H # 70 In Front Of Baitur Nur Jame Masjid	26.08.2020	11.03.2021	N
2	MD-1.1.RR.1030.1	23° 43' 53.0" N 90° 29' 44.4" E	Demra, Demra Bridge Songlogno Bazar Road, Nama Para, Momotaj	26.08.2020	11.03.2021	N
3	MD-1.1.RR.1030.2	23° 43' 53.0" N 90° 29' 44.4" E	Demra, Demra Bridge Songlogno Bazar Road, Nama Para, Momotaj	26.08.2020	11.03.2021	N
4	MD-1.1.RR.1213.1	23° 43' 52.2" N 90° 29' 49.2" E	Demra, Uttorbazar, Birij Road, Alauddin Babu	26.08.2020	11.03.2021	N
5	MD-1.1.RR.1214.1	23° 43' 52.2" N 90° 29' 49.2" E	Demra, Uttorbazar, Birij Road, Salauddin	26.08.2020	11.03.2021	N
6	MD-1.1.RR.1215.1	23° 43' 52.2" N 90° 29' 49.2" E	Demra, Uttorbazar, Birij Road, Anowara Begum	26.08.2020	11.03.2021	N
7	MD-1.1.RR.1216.1	23° 43' 49.8" N 90° 29' 51.0" E	Demra, Uttorbazar, Birij Road, Sogor (west side of Masque)	26.08.2020	11.03.2021	N
8	MD-1.1.RR.1334.1	23° 43' 44.0" N 90° 29' 54.1" E	Demra, Kamargop, Rukonpur Road, H # 2, Joynal, Nearest Kamargop Masjid	25.08.2020	11.03.2021	N
9	MD-1.1.RR.1335.1	23° 43' 44.0" N 90° 29' 54.1" E	Demra, Kamargop, Rukonpur Road, H # 2, Abdur Sattar, Nearest Kamargop Masjid	25.08.2020	11.03.2021	N
10	MD-1.1.RR.1336.1	23° 43' 45.7" N 90° 29' 54.2" E	Demra, Kamargop, Rukonpur Road, Rezia Khatun, Nearest Kamargop Masjid	25.08.2020	11.03.2021	N
11	MD-1.1.RR.1337.1	23° 43' 45.7" N 90° 29' 54.2" E	Demra, Kamargop, Rukonpur Road, Mehen Nahar, Nearest Kamargop Masjid	25.08.2020	11.03.2021	N
12	MD-1.1.RR.1338.1	23° 43' 45.7" N 90° 29' 54.2" E	Demra, Kamargop, Rukonpur Road, Abul Hasan, Nearest Kamargop Masjid	25.08.2020	11.03.2021	N
13	MD-1.1.RR.1339.1	23° 43' 45.7" N 90° 29' 54.2" E	Demra, Kamargop, Rukonpur Road, Khaja Shahab Uddin , Nearest Kamargop Masjid	25.08.2020	11.03.2021	N
14	MD-1.1.RR.1341.1	23° 43' 47.0" N 90° 29' 53.6" E	Demra, Kamargop, Moddo Bazar, Kulsum Bibi	25.08.2020	11.03.2021	N
15	MD-1.1.RR.1482.1	23° 43' 56.8" N 90° 29' 43.3" E	Demra, Demra Bazar, Notun Bridge Songlogno Road, Abdul Kuddus	26.08.2020	11.03.2021	Y
16	MD-1.1.RR.1483.1	23° 43' 56.8" N 90° 29' 43.3" E	Demra, Demra Bazar, Notun Bridge Songlogno Road, Mrs. Fatema Bibi	26.08.2020	11.03.2021	N
17	MD-1.1.RR.1484.1	23° 43' 56.8" N 90° 29' 43.3" E	Demra, Demra Bazar, Notun Bridge Songlogno Road, Adam Ali Bepari	26.08.2020	11.03.2021	N

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18	MD-1.1.RR.1485.1	23° 43' 56.8" N 90° 29' 43.3" E	Demra, Demra Bazar, Notun Bridge Songlogno Road, Md. Mukter Hossen	26.08.2020	11.03.2021	N
19	MD-1.1.RR.1486.1	23° 43' 56.8" N 90° 29' 43.3" E	Demra, Demra Bazar, Notun Bridge Songlogno Road, Md. Nowab Mia	26.08.2020	11.03.2021	N
20	MD-1.1.RR.1487.1	23° 43' 51.2" N 90° 29' 50.5" E	Demra, Demra Uttor Bazar, Alomgir	26.08.2020	11.03.2021	N
21	MD-1.1.RR.1488.1	23° 43' 51.2" N 90° 29' 50.5" E	Demra, Demra Uttor Bazar, Mullani Begum	26.08.2020	11.03.2021	N
22	NA-J.6.RR.591.1	23° 39' 47.0" N 90° 31' 08.0" E	Narayanganj, Siddhirgonj, Godnaile, BE Road, H# Nur Alam Hossain	27.08.2020	11.03.2021	N
23	NA-J.6.RR.591.2	23° 39' 47.0" N 90° 31' 08.0" E	Narayanganj, Siddhirgonj, Godnaile, BE Road, H# Nur Alam Hossain	27.08.2020	11.03.2021	N
24	NA-J.6.RR.594.1	23° 39' 46.0" N 90° 31' 08.0" E	Narayanganj, Siddhirgonj, Godnaile, BE Road, H# Abdur Rahman	27.08.2020	11.03.2021	N
25	NA-J.6.RR.596.1	23° 39' 47.0" N 90° 31' 07.0" E	Narayanganj, Siddhirgonj, BE Road, Godnaile, Md. Shied	27.08.2020	11.03.2021	N
26	NA-J.6.RR.598.1	23° 39' 43.0" N 90° 31' 07.0" E	Narayanganj, Siddhirgonj, BE Road, Godnaile, Hazi Awal Saud	27.08.2020	11.03.2021	N
27	NA-J.6.RR.599.1	23° 39' 43.0" N 90° 31' 07.0" E	Narayanganj, Siddhirgonj, BE Road, Godnaile, Abdur Rob Saud	27.08.2020	11.03.2021	N
28	NA-J.6.RR.600.1	23° 39' 44.0" N 90° 31' 06.0" E	Narayanganj, Siddhirgonj, BE Road, Godnaile, Ali akkas	27.08.2020	11.03.2021	N
29	NA-J.6.RR.690.1	23° 39' 41.0" N 90° 31' 01.0" E	Narayanganj, Siddhirganj, Gudnail Berma Stand, Bagpara, Shahabuddin	27.08.2020	11.03.2021	N
30	NA-J.6.RR.691.1	23° 39' 40.0" N 90° 31' 03.0" E	Narayanganj, Siddhirganj, Gudnail Berma Stand, Bagpara, Md. Alomgir Hossain, H# 476	27.08.2020	11.03.2021	N
31	NA-J.6.RR.691.2	23° 39' 40.0" N 90° 31' 03.0" E	Narayanganj, Siddhirganj, Gudnail Berma Stand, Bagpara, Md. Alomgir Hossain, H# 476	27.08.2020	11.03.2021	N
32	NA-J.6.RR.692.1	23° 39' 40.0" N 90° 31' 03.0" E	Narayanganj, Siddhirganj, Gudnail Berma Stand, Bagpara, Mst. Shahida Akter	27.08.2020	11.03.2021	N
33	NA-J.6.RR.693.1	23° 39' 39.9" N 90° 31' 04.3" E	Narayanganj, Siddhirganj, Gudnail Berma Stand, Bagpara, Md. Afaz Uddin Mir, H# 479	27.08.2020	11.03.2021	N
34	NA-J.6.RR.693.2	23° 39' 39.9" N 90° 31' 04.3" E	Narayanganj, Siddhirganj, Gudnail Berma Stand, Bagpara, Md. Afaz Uddin Mir, H# 479	27.08.2020	11.03.2021	N
35	NA-J.6.RR.694.1	23° 39' 41.0" N 90° 31' 05.0" E	Narayanganj, Siddhirganj, Gudnail Berma Stand, Bagpara, Shofiqul Islam, H# 134	27.08.2020	11.03.2021	N
36	NA-J.6.RR.695.1	23° 39' 42.0" N 90° 31' 05.0" E	Narayanganj, Siddhirganj, Gudnail Berma Stand, Bagpara, Md. Nurul	27.08.2020	11.03.2021	N

			Haque, H# 127			
37	NA-J.6.RR.783.1	23° 39' 48.0" N 90° 31' 02.0" E	Narayanganj, Siddhirgonj, Adamjinagar, Padma Road, MD.Abule Hossain	01.09.2020	11.03.2021	N
38	MD-1.1.RR.401.1	23° 42' 51.5" N 90° 28' 07.6" E	Jatrabari, Kunapara, Paradagor, Nearest Dorbar Shorif Jame Mosjid Road, Arif Akbor	24.08.2020	11.03.2021	N
39	MD-1.1.RR.402.1	23° 42' 53.1" N 90° 28' 04.3" E	Jatrabari, Kunapara, Paradagor, Asraful Ulum Madrasa Road, H # 70	23.08.2020	11.03.2021	N
40	MD-1.1.RR.403.1	23° 42' 53.7" N 90° 28' 04.4" E	Jatrabari, Kunapara, Paradagor, Asraful Ulum Madrasa Road, Tutul	23.08.2020	11.03.2021	N
41	MD-1.1.RR.405.1	23° 42' 54.1" N 90° 27' 41.3" E	Jatrabari, Matuail Uttarpara, D.N.D Road, Homayun Kabir	19.08.2020	11.03.2021	N
42	MD-1.1.RR.406.1	23° 42' 54.1" N 90° 27' 41.3" E	Jatrabari, Matuail Uttarpara, D.N.D Road, Tomij Uddin	19.08.2020	11.03.2021	N
43	MD-1.1.RR.407.1	23° 42' 52.1" N 90° 27' 41.5" E	Jatrabari, Matuail Uttarpara, D.N.D Road, Saidul Islam	19.08.2020	11.03.2021	N
44	MD-1.1.RR.408.1	23° 42' 51.0" N 90° 27' 41.0" E	Jatrabari, Matuail Uttarpara, Taltola Road, Muktahar	19.08.2020	11.03.2021	N
45	MD-1.1.RR.409.1	23° 42' 49.0" N 90° 27' 38.8" E	Jatrabari, Matuail Uttarpara, 2 Number School Goli, Abdul Roshid	19.08.2020	11.03.2021	N
46	MD-1.1.RR.410.1	23° 42' 51.6" N 90° 27' 39.2" E	Jatrabari, Matuail Uttarpara, Matuail Uttarpara Mosjid Road, Mazahar Chowdury	23.08.2020	11.03.2021	N
47	MD-1.1.RR.410.2	23° 42' 51.6" N 90° 27' 39.2" E	Jatrabari, Matuail Uttarpara, Matuail Uttarpara Mosjid Road, Mazahar Chowdury	23.08.2020	11.03.2021	N
50	NA-J.6.RR.696.1	23° 39' 39.0" N 90° 30' 58.0" E	Narayanganj, Siddhirganj, Gudnail Berma Stand, Bagpara, Md. Nurul Basar, Word-10, H# 440/1	31.08.2020	11.03.2021	N
51	NA-J.6.RR.696.2	23° 39' 39.0" N 90° 30' 58.0" E	Narayanganj, Siddhirganj, Gudnail Berma Stand, Bagpara, Md. Nurul Basar, Word-10, H# 440/1	31.08.2020	11.03.2021	N
52	NA-J.6.RR.782.1	23° 39' 50.0" N 90° 31' 00.0" E	Narayanganj, Siddhirgonj, Adamjinagar, Padma Road, H# 173, Nasiruddin	31.08.2020	11.03.2021	N
53	NA-J.6.RR.782.2	23° 39' 50.0" N 90° 31' 00.0" E	Narayanganj, Siddhirgonj, Adamjinagar, Padma Road, H# 173, Nasiruddin	31.08.2020	11.03.2021	N
54	NA-J.6.RR.784.1	23° 39' 50.0" N 90° 30' 59.0" E	Narayanganj, Siddhirgonj, Godnail, Bagpara, Kabarstan Road, Azmot Ali, near Sukhineer	31.08.2020	11.03.2021	N
55	NA-J.6.RR.1201.1	23° 39' 48.0" N 90° 30' 59.0" E	Narayanganj, Siddhirgonj, Godnaile, Syad kazi	31.08.2020	11.03.2021	N
56	NA-J.6.RR.587.1	23° 39' 48.0" N 90° 31' 06.0" E	Narayanganj, Siddhirgonj, Godnaile, BE Road, H# Md.Yeakul Zaman	27.08.2020	11.03.2021	N

57	NA-J.6.RR.588.1	23° 39' 48.0" N 90° 31' 06.0" E	Narayangonj, Siddhirgonj, Godnaile, BE Road, H# Jalal Ahmed	27.08.2020	11.03.2021	N
58	NA-J.6.RR.589.1	23° 39' 48.0" N 90° 31' 06.0" E	Narayangonj, Siddhirgonj, Godnaile, BE Road, H# Abdul Kader	27.08.2020	11.03.2021	N
59	NA-J.6.RR.590.1	23° 39' 48.0" N 90° 31' 07.0" E	Narayangonj, Siddhirgonj, Godnaile, BE Road, H# Abdul Motin	27.08.2020	11.03.2021	N
60	MD-1.1.RR.914.1	23° 43' 54.1" N 90° 29' 35.6" E	Demra, Naraibag, Mala Market, Sohel	26.08.2020	11.03.2021	N
61	MD-1.1.RR.915.1	23° 43' 56.0" N 90° 29' 34.8" E	Demra, Naraibag, Molla Bari, Ruhul Main Molla	26.08.2020	11.03.2021	N
62	MD-1.1.RR.916.1	23° 43' 57.0" N 90° 29' 34.9" E	Demra, Naraibag, Molla Bari, Sohel Rana	26.08.2020	11.03.2021	N

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	1	1	
Post-registration changes		1	
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline			
Compliance of monitoring activities with the registered monitoring plan	1		
Compliance with the calibration frequency requirements for measuring instruments			
Assessment of data and calculation of emission reductions or net removals	1		
Others (please specify)			
Total	3	2	0

SECTION. E. Verification findings

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

Means of verification	To check the compliance of the monitoring report with the latest monitoring report form available at UNFCCC
Findings	The latest version of MR form available at UNFCCC is 7.0 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 at least version of the MR available at UNFCCC.

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

NA

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

Means of verification	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
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	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 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 and found to be correct. 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	CAR 1 has been raised since the project implementation part is not clear on the total number of leaks and the number of leaks monitored during the third monitoring period. PP as a response, has updated to include the number of leaks monitored and total number of leak repairs in the database. CAR 2 has been raised since MR mentions the change of start date of crediting period, however the same is not relevant to the current MP. PP has removed the same from the MR.
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.
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E.4. Post-registration changes

E.4.1 Temporary deviations from the registered monitoring plan, applied methodologies, standardized baselines or other methodological regulatory documents¹

Not applicable.

E.4.2 Corrections

Not applicable.

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

Not applicable.

E.4.4. Inclusion of a monitoring plan

Not applicable.

E.4.5 Permanent changes from registered monitoring plan, or permanent deviation of monitoring from the applied methodologies, standardized baselines or other methodological regulatory documents

Not applicable.

E.4.6 Changes to the project design

Not applicable.

E.4.7 Changes specific to afforestation and reforestation project activities

Not applicable.

E.5. Compliance of the registered monitoring plan with applied methodologies, applied standardized baselines, and other applied methodological regulatory documents

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.

¹ Other standards, methodologies, methodological tools and guidelines (to be) applied in accordance with the applied(selected) methodologies are collectively referred to as the other (applied) methodological regulatory documents).

	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.
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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. 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.
Findings	No CAR/CL has been raised.
Conclusion	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:	Urj
	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 $\pm 10\%$ 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:	Urz	
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 $\pm 10\%$ 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:	$F_{CH_4, j}/F_{CH_4, z}$
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/Comments:	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/Comments:	Capped quantity as per the methodology. Since the actual emission reductions achieved during this period 4,169,047 exceeds the BEcap figure, the total claimed ERs for this monitoring period is the BEcap total 4,049,551. The total ERs reported has exceeded the Bcap as defined in the methodology, hence the PP has capped the baseline emissions to the monitored baseline emissions during the first year of the first crediting period, which is conservative.
Cross-check	--

Data / Parameter:	W _{sampleCH₄, i}
Data unit:	volume percent
Description:	The concentration of methane in the sample flow from leak i
Source of data used:	Direct measurement using calibrated bagging
Means of verification/Comments:	Not applicable since the measurement method has not been used for the leaks in the current monitoring period. Concentration of methane in the bag sample would be measured using leak detection equipment. This procedure is done by the gas transmission company and the results are provided to Titas. As the Hi Flow Sampler only accounts for methane (100%) this procedure will only apply in cases where bagging has

	<table border="1"> <tr> <td></td> <td> been used to calculate leak rates. The same has been checked and confirmed by the audit team. </td> </tr> <tr> <td>Cross-check</td> <td>--</td> </tr> </table>		been used to calculate leak rates. The same has been checked and confirmed by the audit team.	Cross-check	--								
	been used to calculate leak rates. The same has been checked and confirmed by the audit team.												
Cross-check	--												
Findings	<table border="1"> <tr> <td>Data / Parameter:</td> <td>$t_{\text{aver},i}$</td> </tr> <tr> <td>Data unit:</td> <td>Sec</td> </tr> <tr> <td>Description:</td> <td>Average bag fill time for leak i</td> </tr> <tr> <td>Source of data used:</td> <td>On-site measurements using calibrated bagging</td> </tr> <tr> <td>Means of verification/Comments:</td> <td>Not applicable since the measurement method has not been used for the leaks in the current monitoring period</td> </tr> <tr> <td>Cross-check</td> <td>--</td> </tr> </table> CL 3 has been raised after incompleteness request. Some of leaks were not monitoring during this monitoring period which is not in line with the monitoring plan, and also in the ER calculation sheet, the ERs were calculated considering the period outside the third monitoring period. PP has revised the monitoring report and calculations. PP has to do annual monitoring of FCH₄, j/FCH₄, z/ (leak flow rate of methane for leak (j, z) from the leaking component) and $t_{\text{aver},i}$ (Average bag fill time for leak i) while the monitoring report and it needs to be done once per monitoring period. However due to inaccessibility of some of the leaks due to localised activities or any shut downs, these could not be monitored by the PP during the current monitoring period. The audit team has checked the same from the database of the leaks. PP has not considered any emission reductions for those leaks which were not monitored during the current period. So the ERs were calculated as zero for the non monitored leaks and hence found conservative. Also PP has revised the ER spreadsheet to consider the 'Later of Date of repair and start date of Monitoring Period' as start date of current monitoring period which is 08/11/2019 and 'Date of monitoring/date of monitoring after repair of reemerged/ date of new leak repair during third monitoring period. In this way, the total ERs presented corresponds to the current monitoring period only. The actual emission reductions achieved during this period 4,169,047 exceeds the BEcap figure, the total claimed ERs for this monitoring period is the BEcap total 4,049,551. The PP has capped the baseline emissions to the monitored baseline emissions during the first year of the first crediting period, which is conservative.	Data / Parameter:	$t_{\text{aver},i}$	Data unit:	Sec	Description:	Average bag fill time for leak i	Source of data used:	On-site measurements using calibrated bagging	Means of verification/Comments:	Not applicable since the measurement method has not been used for the leaks in the current monitoring period	Cross-check	--
Data / Parameter:	$t_{\text{aver},i}$												
Data unit:	Sec												
Description:	Average bag fill time for leak i												
Source of data used:	On-site measurements using calibrated bagging												
Means of verification/Comments:	Not applicable since the measurement method has not been used for the leaks in the current monitoring period												
Cross-check	--												
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 remote 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
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E.6.3. Implementation of sampling plan

Means of verification	Project participants did not apply a sampling approach for the determination of data and parameters monitored but have monitored the entire leaks. DOE has carried out sampling as per the Sampling and surveys for CDM project activities and programmes of activities Version 8.0
Findings	No CAR/CL has been raised.
Conclusion	DOE has carried out sampling as per the Sampling and surveys for CDM project activities and programmes of activities Version 8.0

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

Means of verification	The audit team has checked the calibration certificates and records of the monitoring equipment as given below: Hi-Flow Sampler 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: 13/08/2020, 10/09/2020 NQ 1001: 26/01/2020, 19/02/2020, 16/03/2020, 16/07/2020, 15/08/2020, 10/09/2020, 07/10/2020, 06/11/2020, 03/12/2020 NQ 1002: 10/09/2020 NQ 1003: 13/08/2020 NQ 1007: 13/08/2020, 10/09/2020 NQ 1009: 13/08/2020, 10/09/2020 MN 1018: 13/08/2020, 10/09/2020 MN 1032: 13/08/2020, 10/09/2020 MP 1006: 13/08/2020, 10/09/2020 MP 1032: 13/08/2020, 10/09/2020 LU 1001: 13/08/2020, 10/09/2020 LX 1011: 13/08/2020, 10/09/2020 16020932: 26/01/2020, 05/03/2020, 16/03/2020, 16/07/2020, 15/08/2020, 10/09/2020, 07/10/2020, 06/11/2020, 03/12/2020 16020936: 26/01/2020, 19/02/2020, 16/03/2020, 15/08/2020, 10/09/2020
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	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. Gas Surveyor Serial Numbers of the Gas surveyors used during this monitoring period and relevant dates of calibration: 539910: 26/01/2020, 16/07/2020 539911: 26/01/2020, 16/07/2020 539912: 26/01/2020, 16/07/2020 513671: 26/01/2020, 16/07/2020 511041: 16/07/2020 510433: 16/07/2020 508393: 16/07/2020 509379: 16/07/2020 510764: 16/07/2020 510641: 16/07/2020 The Calibration frequency of the Gas surveyor as per the Gas surveyor Handbook is one year. In some cases in this monitoring period, the Gas surveyors were calibrated more frequently than their required calibration schedule to ensure their continued proper function. The Calibration has been performed by the certified staff and the documents regarding the same have been verified by the audit team.
Findings	CL 1 has been raised since the MR did not mention the calibration details of the Gas surveyors used in the monitoring and the PP has not submitted the calibration certificates of the same. The audit team has checked the calibration certificates of the Gas Surveyors and also MR has been updated accordingly.
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 manufacturer specifications..

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
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	in the MR and the CER excel sheet have been verified in accordance with the formulae as per the methodology.
Findings	CL 2 has been raised since it was observed that HFS memory HFS numbers NQ1001, NQ1007, NQ1009, LX1011, MN1018 MN1032, MP1032 memory was corrupted for few leaks. Still the ERs have been calculated for this riser using the same HFS data. PP as a response has clarified that sometimes error may occur during downloading the data from HFS and some records gets corrupted. For these Risers (Leaks), manual hard copy of individual riser is referred for calculation of ERs, the methodology allows any of these sources of data to be used to calculate ERs in cases where the electronic HFS memory is corrupted. In this case the other sources were used to include the leak in the database. The issue is closed.
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 logbooks 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 anthropogenic GHG removals by sinks

Means of verification	No project emissions since finding and repairing gas leaks does not create Project Emissions
Findings	Not Applicable
Conclusion	Not Applicable

E.8.3. Calculation of leakage GHG emissions

Means of verification	No leakage emissions
Findings	No leakage emissions
Conclusion	No leakage emissions

E.8.4. Summary 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 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 equipment, monitoring measurements and reporting, record handling and maintenance, reviewing monitored data are available at the plant. All the
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	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: 4,049,551 tCO₂e Baseline: 4,049,551 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 ERs for this monitoring period are 5,002,293 tCO ₂ e however during this monitoring period the reported ERs are 4,049,551tCO ₂ e. This clearly demonstrates that the reported emission reductions resulted are lower than that of estimated in the CDM-PDD.
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 4,049,551 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 4,049,551 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
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E.9 Assessment of reported sustainable development co-benefits

Means of verification	Not applicable
Findings	Not applicable
Conclusion	Not applicable

E.10. Global stakeholder consultation

Means of verification	The DOE has checked whether any comments have been received during global stakeholder consultation process. No comments were received during this process.
Findings	No CAR/CL has been raised.
Conclusion	The DOE concludes that no comments were received during global stakeholder consultation process in line with paragraph 187 of the PCP for project activities version 02.0. and para 391 of the VVS for project activities version 02.0.

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 CB "Environment and Energy".

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: 4,049,551 tCO₂e

Baseline: 4,049,551 tCO₂e
 Project emissions: 0 tCO₂e
 Leakage: 0 tCO₂e

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 28/06/2021, 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, 21/07/2021



Milind Shende

Certification Body "Environment and Energy"
TÜV SÜD South Asia Pvt Ltd

Appendix 1: Abbreviations

Abbreviations	Full texts
AQL	Acceptable Quality Level
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CDM-EB	CDM Executive Board
CER	Certified Emission Reduction
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)
GS	Gas Surveyor
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	Titas 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



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.

Standard	Qualification applicable to				
	CDM	GS	VCS	ISO-14084-1:2008	Other
	☒	☒	☒	☒	☐

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

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

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 31.05.2022 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. CS-IND-CCP-0031/012.

Date	Signature
01/05/2021	

IS-CMS-CB-POG-01/05, version 03

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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 31.05.2022 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. CR-IND-CCR-0009/011

Date	Signature
01/06/2021	

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CERTIFICATE OF APPOINTMENT

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

Qualification applicable to					
Standard	CDM	CS	VCS	ISO-14054-1:2006	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	India					

Technical Area	
1.2 Renewables	
3.1 Energy demand	
7.1 Transport	
13.1 Solid waste and wastewater	

This appointment is valid until 31.05.2022 and is bound by internal requirements of the Certification Body 'Environment and Energy' of TUV SUD 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-0096/008.

Date	Signature
01/06/2021	

IS-CMS-CB-POG-01/05, version 03

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CERTIFICATE OF APPOINTMENT

Mr. Chandra Manish fulfils the requirements as per the Evaluation and Qualification criteria (IS-CMS-CB-POG-01/01) of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd and is appointed as a

Technical Reviewer/ Expert

10.1.	Fugitive emissions from oil and gas
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This appointment as a Technical Reviewer/ Expert is for his involvement in projects related to CDM, GS and VCS Standards.

This appointment is valid until 31.03.2022 and is bound by internal requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd.

Your Certificate has the internal reference no. CB-IND-CCP-00103/001.

Date	Signature
01/04/2021	

IS-CMS-CB-POG-01/03, version 04

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CERTIFICATE OF APPOINTMENT

Mr. Khalil, Md Mobassir fulfills the requirements as per the Evaluation and Qualification criteria (IS-CMS-CB-POG-01/01) of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd and is appointed as a

Country Expert- Bangladesh

This appointment as a Country Expert is for his involvement in projects related to CDM, GS and VCS Standards.

This appointment is valid until 28.02.2022 and is bound by internal requirements of the Certification Body 'Environment and Energy' of TÜV SÜD South Asia Pvt Ltd.

Your Certificate has the internal reference no. CB-IND-CCP-CE-05/01.

Date	Signature
01/03/2021	

IS-CMS-CB-POG-01/05, version 04

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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	UNFCCC	Sampling and surveys for CDM project activities and programmes of activities	Version 8.0	
4	NE Climate	Published Monitoring Report	Version.1, 09/02/2021	NE Climate
5	NE Climate	Registered PDD	Version 6, 16/03/2015	NE Climate
6	NE Climate	Final Monitoring Report	Version 4 28/06/2021	NE Climate
7	PSL	Hi Flow Samplers Calibration log book	08/11/2019 - 31/12/2020	NE Climate
8	PSL	Gas Surveyors Calibration log book	08/11/2019 - 31/12/2020	NE Climate
9	PSL	Error list of Hi Flow Sampler	08/11/2019 - 31/12/2020	NE Climate
10	PSL	Statement regarding provision of materials and personnel for monitoring	18/02/2020 18/02/2021	NE Climate
11	PSL	Statement regarding leak detection and measurement team	18/02/2021	NE Climate
12	Bacharach	Manual for Hi Flow Sampler	May 2005	NE Climate
13	Titas Gas	Statement regarding disconnections	08/03/2021	NE Climate
14	Titas Gas	Letter stating the team members and their responsibilities from Titas Gas for the third monitoring period	08/03/2021	NE Climate
15	MBS	Training course completion certificate on Hi Flow Sampler for 37 nos. of operators and managers	2016, 2019	NE Climate
16	MBS	Confirmation of technical skills of PSL and Titas Gas managers to use Hi flow Samplers, Gas surveyors and Monitoring systems	15/01/2021	NE Climate
17	MBS	Confirmation of the visits in March 2020 by MBS personnel for training, inspection, support to data collection and calibration process	15/01/2021	NE Climate
18	NE Climate	ER calculation spreadsheet for the total leak monitoring including outages	28/06/2021	NE Climate
19	Titas Gas/PSL	On field leak data tag/ card to record the data-consisting of Leak code, Date, Operator name, Leak rate. Type of leak, Date of Initial repair, Name of repairmen, Leak rate after repairing,	08/11/2019 - 31/12/2020	NE Climate

CDM-VCR-FORM

		Monitoring date of leak		
20	Titas Gas/PSL	Log book data of all leaks before repair and during monitoring	08/11/2019 - 31/12/2020	NE Climate
21	Titas Gas/PSL	Detailed log sheets of all leaks with leak code, photographs and GPS coordinates	08/11/2019 - 31/12/2020	NE Climate
22	NE Climate BP Gas Marketing	Transaction confirmation for carbon credit - Agreement	13/02/2020	NE Climate
23	GMI	Gasurveyor 11-500 user Handbook	16/08/2004	NE Climate

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

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

No remaining FAR from previous verifications.

Table 2. CL from this verification

CL ID	01	Section no.		Date: 14/03/2021
Description of CL				
It was mentioned in the ER sheet and also MR that Gas surveyors were also used in the monitoring of leaks. However, the details of the equipment used and their calibration dates and certificates are not provided to the audit team. PP to provide the same.				
Project participant response				Date: 15/03/2021
The MR has been updated to include the serial numbers of the Gas surveyors used in the project and the relevant calibration records during the monitoring period.				
Documentation provided by project participant				
Revised MR. Calibration log and certificates for the Gas surveyors.				
DOE assessment				Date: 30/03/2021
The audit team has checked the calibration records of the gas surveyors and the details of the equipment has been mentioned in the revised MR. Hence the issue is closed.				

CL ID	02	Section no.	ER sheet	Date: 14/03/2021
Description of CL				
Based on review of Loss of data and error list for HFS during 3 rd monitoring period, it was confirmed that HFS memory HFS numbers NQ1001, NQ1007, NQ1009, LX1011, MN1018 MN1032, MP1032 memory was corrupted for few leaks. Still the ERs have been calculated for this riser using the same HFS data. PP to clarify that how the ERs have been calculated for the given leak IDs, despite error in data of the corresponding HFS numbers mentioned above				
Project participant response				Date: 15/03/2021
The HFS memory can hold the data for only 1000 leaks at a time. When the memory is close to being full, the operators download the files from the HFS. These files are only one of several ways the team cross-references the HFS measurement results that are taken directly from the HFS screen at the time of measurement that have already been hand entered on the hard copy excel sheets and leak tag (with photo), electronically entered into the excel sheet for every leak, and included in the database. Infrequently, when data is downloaded from the HFS, the downloaded data for some individual leaks are corrupted. However, the methodology and PDD anticipate these types of problems by requiring the numerous sources of redundant data management listed above. Therefore, the leak rate determined by the HFS and recorded at the time of measurement in these cases where the line of data for a given leak was corrupted during download from the HFS can still be fully crosschecked for accuracy using the database, individual excel leak sheet, the tag, and the hard copy leak information filled in by the operator. The multiple redundant sources of data required by the methodology and PDD allows for one or more of the sources to be lost without sacrificing the accuracy of the data. Therefore, as per the methodology and PDD, the ERs for these leaks can be calculated and cross-checked with those other redundant sources of data.				
Documentation provided by project participant				
ER sheets				
DOE assessment				Date: 30/03/2021

PP has clarified that sometimes error may occur during downloading the data from HFS and some records gets corrupted. HFS can still be fully crosschecked for accuracy using the database, individual excel leak sheet, the tag, and the hard copy leak information filled in by the operator. Hence the ERs for these leaks can be calculated and cross-checked with those other redundant sources of data. The same has been verified by the audit team and found to be correct. Hence this issue is closed.

CL ID	03	Section no.	Incompleteness	Date: 26/05/2021
Description of CL				
1. The monitoring plan requires the annual monitoring of FCH₄, j/FCH₄, z/ (leak flow rate of methane for leak (j, z) from the leaking component) and taver,i (Average bag fill time for leak i) while the monitoring report (p 18-19, 20) indicates that the measuring frequency of FCH₄, j/FCH₄, z/ is "At least once per monitoring period" and the spreadsheet shows that some of leaks were not monitoring during this monitoring period. PP is required to provide further information on how the monitoring of these parameters are in line with the monitoring plan of the registered PDD. 2. The submitted spreadsheet shows that the period of emission reduction claimed for this monitoring period does not correspond to the monitoring period of this request for issuance (08 Nov 19 - 31 Dec 20). For example, Code "NA-J.6.RR.4423.1" considers the emission reduction from 14 May 2017 to 29 December 2020 while the monitoring period is 08 Nov 19 - 31 Dec 20. The PP requires to provide further information how the calculation presented in the spreadsheet corresponds to the monitoring period				
Project participant response				Date: 28/06/2021
1. The PP makes every effort to visit each repaired leak during the course of the monitoring period. In a small percentage of cases, visiting a leak is physically not possible as the repaired equipment is inaccessible to the monitoring teams. (i.e access is prohibited by construction, equipment is temporarily shut-off for localized construction or system repairs, etc.). In order to be conservative, the PP does not count any CERs during the monitoring period for these physically inaccessible leaks. In this way, a conservative result is assured as no leak that is not visited and measured is counted in the CER total. 2. The spreadsheet has been updated to only include emission reductions that occurred during the monitoring period for every leak repair. In addition, the BEcap reduced the ER total by over 100,000 tCO₂ e and the Uncertainty reduction already provides a 95% level of certainty that the results are conservative.				
Documentation provided by project participant				
Revised MR, ER sheet				
DOE assessment				Date: 20/07/2021

1. PP has to do annual monitoring of FCH₄, j/FCH₄, z/ (leak flow rate of methane for leak (j, z) from the leaking component) and taver, I (Average bag fill time for leak i) while the monitoring report and it needs to be done once per monitoring period. However due to inaccessibility of some of the leaks due to localised activities or any shut downs, these could not be monitored by the PP during the current monitoring period. The audit team has checked the same from the database of the leaks. PP has not considered any emission reductions for those leaks which were not monitored during the current period. So the ERs were calculated as zero for the non monitored leaks and hence found conservative.
2. PP has revised the ER spreadsheet to consider the 'Later of Date of repair and start date of Monitoring Period' as start date of current monitoring period which is 08/11/2019 and 'Date of monitoring/date of monitoring after repair of reemerged/ date of new leak repair during third monitoring period. In this way, the total ERs presented corresponds to the current monitoring period only. The total ERs reported has exceeded the Bcap as defined in the methodology, hence the PP has capped the baseline emissions to the monitored baseline emissions during the first year of the first crediting period, which is conservative.

The audit team has checked the revised MR, ER spreadsheet to confirm the changes. Hence the issue is closed.

Table 3. CAR from this verification

CAR ID	01	Section no.	B.1	Date: 14/03/2021
Description of CAR				
The project implementation part is not clear on the total number of leaks and the number of leaks monitored during the third monitoring period. PP to provide the details.				
Project participant response				Date: 15/03/2021
The MR v.2 has been updated to include the number of leaks monitored and total number of leak repairs in the database.				
Documentation provided by project participant				
Revised MR.				
DOE assessment				Date: 30/03/2021
MR has been revised. Hence the issue is closed.				

CAR ID	02	Section no.	B.2.3	Date: 14/03/2021
Description of CAR				
The MR mentions the change of start date of crediting period, however the same is not relevant to the current MP.				
Project participant response				Date: 15/03/2021
This irrelevant information has been removed.				
Documentation provided by project participant				
Revised MR.				
DOE assessment				Date: 30/03/2021
MR has been revised. Hence the issue is closed.				

Table 4. FAR from this verification

No FAR has been raised during this verification

Document information

<i>Version</i>	<i>Date</i>	<i>Description</i>
04.0	6 April 2021	Revision to: • Reflect the “Clarification: Regulatory requirements under temporary measures for post-2020 cases” (CDM-EB109-A01-CLAR).
03.0	31 May 2019	Revision to: • Ensure consistency with version 02.0 of the “CDM validation and verification standard for programmes of activities” (CDM-EB93-A08-STAN); • Make structural and editorial improvements.
02.0	29 December 2017	Revision to align with the requirements of the “CDM validation and verification standard for programme of activities” (version 01.0).
01.0	5 June 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: programme of activities, verifying and certifying		