



**Verified Carbon  
Standard**

A VERRA STANDARD

# REDUCING GAS LEAKAGES WITHIN THE JALALABAD GAS DISTRIBUTION NETWORK IN BANGLADESH

Document Prepared By:

Carbon Check (India) Private Ltd.



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## Summary:

- **A brief description of the verification and the project**

**Verification:** Carbon Check (India) Private Ltd. (CC IPL) has been contracted by EcoGas Asia Limited, the project proponent, to carry out the verification of voluntary greenhouse gas emission reductions generated by the Project, “Reducing Gas Leakages within the Jalalabad Gas Distribution Network in Bangladesh”. The verification is based on the desk review of the Monitoring report /01/, VCS PD /06/, registered CDM PDD /B03/, previous CDM verifications /B03/, supporting emission reduction calculation spread-sheets /02/, and other relevant supporting documents made available to the verification team by the project proponent accompanied by on-site interviews. This verification involves the period of 20/01/2019 to 30/07/2020 (including both days).

**Project:** The project’s transmission and distribution of natural gas are located within the northeast part of Bangladesh in the districts of Sylhet, Moulvibazar, Habigonj, and Sunamgonj. The project will lead to reductions in methane, a potent greenhouse gas (GHG). The project reduces gas leakages from components in the natural gas transmission and distribution system operated by Jalalabad Gas Company Limited (JGTDSL) in Bangladesh. During the present monitoring period, the project has reported a total of 10,905 leaks within the project boundary.

- **The purpose and scope of verification**

**Purpose:** The purpose of the verification is to review the monitoring results and verify that the monitoring methodology was implemented according to the monitoring plan and monitoring data, used to confirm the reductions in anthropogenic emissions by sources is sufficient, definitive, and presented in a concise and transparent manner. In particular, the monitoring plan, monitoring report, and the project’s compliance with relevant VCS, UNFCCC, and host party criteria are

verified to confirm that the project has been implemented in accordance with the previously registered design and conservative assumptions, as documented.

**Scope:** The scope of the verification is:

- To verify the project implementation and operation with respect to the registered PDD and VCS PD.
- To verify the implemented monitoring plan with the registered PDD and applied baseline and monitoring methodology.
- To verify that the actual monitoring systems and procedures comply with the monitoring systems and procedures described in the monitoring plan.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.

The verification shall ensure that the reported emission reductions are complete and accurate to be certified.

- **The method and criteria used for verification**

- (a) Desk review, involving:

- (i) Review of the data and information presented to verify their completeness;
    - (ii) Review of the monitoring plan and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, and the quality assurance and quality control procedures;
    - (iii) Evaluation of data management and the quality assurance and quality control system in the context of their influence on the generation and reporting of emission reductions;

- (b) On-site assessment involving:

- (i) Assessment of the implementation and operation of the proposed VCS project as per the registered PDD and VCS PD;
    - (ii) Review of information flows for generating, aggregating, and reporting the monitoring parameters;
    - (iii) Interview with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the monitoring plan in the registered PDD;
    - (iv) A cross-check between information provided in the monitoring report and data from other sources such as inventories, purchase records, or similar data sources;
    - (v) A check of the monitoring equipment including calibration performance and observations of monitoring practices against the requirements of the registered PDD and the selected methodology;
    - (vi) Review of calculations and assumptions made in determining the GHG data and emission reductions;
    - (vii) Identification of quality control and quality assurance procedures in place to prevent or identify and correct any errors or omissions in the reported monitoring parameters.

- **The number of findings raised during verification**

A risk-based approach has been followed to perform this verification. During the course of verification, a total of 05 findings were raised, which include:

04 Corrective Action Request (CAR); 08 Clarification Requests (CLs);

All the raised findings have been resolved by the PP.

- **Any uncertainties associated with the verification**

The VCS MR /01/, emissions reduction calculations /02/ along with the supporting documents provided are considered to be in line with all the VCS requirements /B01/. The verification team has detected no further uncertainties or quality restrictions.

- **Summary of the verification conclusion**

In CCIPL's opinion, the emission reductions reported for the project "Reducing Gas Leakages within the Jalalabad Gas Distribution Network in Bangladesh" in the monitoring report are fairly and correctly stated. CCIPL is, therefore, able to certify that the emission reductions from the project during the period from 20/01/2019 to 30/07/2020, are 1,056,658 tCO<sub>2</sub> equivalents.

CC IPL does not assume any responsibility for the issuance and utilization of VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration. The verification of reported emission reductions is based on the information made available to CCIPL and the engagement conditions detailed in this report. Hence, CCIPL cannot be held liable by any party for decisions made or not made based on this report.

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# 1 INTRODUCTION

## 1.1 Objective

Carbon Check (India) Private Ltd. (CC IPL) has been contracted by EcoGas Asia Limited, the Project Proponent (PP), to undertake the verification of the project titled “Reducing Gas Leakages within the Jalalabad Gas Distribution Network in Bangladesh” for the monitoring period 20/01/2019 to 30/07/2020 (including both days). Through the verification activities, it is to be confirmed that:

- The project is implemented as described in the VCS Project Description document /06/.
- The monitoring system is implemented and fully functional to generate emission reductions without any double-counting, and
- The data reported are accurate, complete, consistent, transparent, and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

The verification followed the requirements of the current version of the VCS Standard, Version 4.2, and the VCS program guide, Version 4.1 /B01/ to ensure the quality and consistency of the verification work and the report.

## 1.2 Scope and Criteria

The verification of this project is based on the Monitoring Report of this monitoring period /01/, registered PDD /B03/ and VCS PD /06/, Emission reduction calculation spreadsheets /02/, supporting documents made available to the verifier /03/-/24/, and information collected through performing on-site visit interviews. Furthermore, publicly available information was considered as far as available and required.

CC IPL has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

The verification is carried out on basis of the following requirements, applicable for this project activity:

- VCS Standard (v4.2) /B01/
- VCS Program Guide (v4.1) /B01/
- CDM Methodology: AM0023, Version 04 /B02/.
- Other relevant rules, including the host country legislation

The scope of this verification, by independent checking of objective evidence, is as follows:

- To verify that the project is implemented as described in the registered CDM PDD and the VCS PD.
- To assess the project's compliance with other relevant rules including the host country legislation.
- To confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions without any double counting.
- To establish that the data reported are accurate, complete, consistent, transparent, and free of material error or omission by checking the monitoring records and the emissions reduction calculation.
- To evaluate the GHG emission reduction data and express a conclusion with a reasonable level of assurance about whether the reported GHG emission reduction data is free from material misstatement.
- To verify that reported GHG emission data is sufficiently supported by evidence.
- The verification shall ensure that the reported emission reductions are complete and accurate to be certified.

The method and criteria used for verification consisted of the following phases:

1. Completeness check and desk review;
2. On-site visit interviews with stakeholders;
3. Resolution of outstanding issues and issuance of final verification report and applicable VCS Validation and Verification Deeds of Representation.

CC IPL conducts all its work under strict rules to safeguard impartiality and ensure the independence of the verification team. The verification team does not provide any consulting or recommendations for the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the monitoring activities.

### 1.3 Level of Assurance

The verification report is based on the Monitoring report /01/, registered PDD /B03/, VCS PD /06/, supporting documents /03/-/24/ made available to the verifier, and information collected through performing interviews.

The verification has been planned and organized to achieve a:

- Reasonable level of assurance as per VCS Standard (v4.2)
- Limited level of assurance

## 1.4 Summary Description of the Project

This is the first monitoring report under VCS for the project which employs the CDM methodology; AM0023, Version 04 /B02/. The project aims to reduce gas leakages from components in the natural gas transmission and distribution system operated by Jalalabad Gas Transmission and Distribution System Limited (JGTDSL) in Bangladesh. The length of the JGTDSL natural gas transmission/distribution system is about 3,818 km. The Company carries out transmission and distribution of natural gas within the northeast part of Bangladesh in the districts of Sylhet, Moulvibazar, Habigonj, and Sunamgonj. The project reduces the leaks in the transmission/distribution system caused by normal component wear, thermal and vibrational stresses, and seasonal expansion/contraction cycling from ambient air temperature changes. The project implements advanced leak detection and repairs (LDAR) procedures to identify and implement various interventions to arrest leakage and thus reduce methane emissions at valves, insulating joints, pressure regulators, and other above-ground gas transmissions/distribution infrastructure. The project proponent for the project activity is EcoGas Asia Limited, which owns the rights to VCU's /04/.

The total GHG emission reductions achieved from Project activity are 1,056,658 tCO<sub>2e</sub> for this monitoring period.

The project activity has been implemented as described in the registered PDD and VCS PD and the emission reductions are calculated conservatively as per the applied methodologies /B02/.

# 2 VERIFICATION PROCESS

## 2.1 Method and Criteria

The method and criteria used for verification:

The verification consists of the following three phases:

1. Completeness check and desk review of the validation report, monitoring plan, monitoring report, monitoring methodology, VCS PD, and applicable tools in particular attention to the frequency of measurements, quality of metering equipment including calibration requirements, QA/QC procedures, and other relevant documents;
2. On-site visit interviews (including follow-up interviews with project stakeholders, when deemed necessary). The on-site interviews include the following:
  - An assignment of implementation and operation of project activity with respect to registered PDD and validated VCS PD
  - Review of information flows for generating, aggregating, and reporting the monitoring parameters;

- Interview with relevant personnel to determine whether the operational and data collection procedures are implemented and in accordance with the monitoring plan of the registered PDD,
  - Cross-check information and data provided in the monitoring report with purchase records or similar data sources;
  - Review of assumptions made in calculating the emission reductions (if any);
  - Implementation of QA/QC procedure in-line with the registered PDD and methodology requirements.
3. Resolution of outstanding issues and the issuance of the final Verification report and as applicable the VCS Verification Deed of Representation.

## 2.2 Document Review

During the document review, CCIPL applied standard auditing techniques to assess the quality of the information provided. The verification was performed primarily based on the review of the monitoring report and the supporting documentation. This process included:

- A review of data and information presented by the PP to verify their completeness
- A review of the MP and monitoring methodology, paying particular attention to the frequency of measurements, the quality of metering equipment including calibration requirements, the QA/QC procedures, and
- An evaluation of data management and the QA/QC system in the context of their influence on the generation and reporting of ERs.

The monitoring report (version 1 dated 29/04/2022) /01/ was initially reviewed and CCIPL requested the PP to present the supporting information and documents /03/-/24/. The documents were reviewed by CCIPL. Through the process of the verification, the revised monitoring report and the supporting documents were evaluated to confirm the actions taken by the PP to the CARs and CLs issued by the verification team.

The list of documents referred to during the course of this verification has been provided in Appendix-1.1.

## 2.3 Interviews

A site visit to the project activity was undertaken on 15/06/2022 to confirm the information as outlined in the table below and to resolve issues identified in the document review. The site visit was conducted to assess the implementation and operation of the project activity and review evidence, and interview key personnel to confirm evidence associated with the project design, implementation, plant operations, environmental impacts, stakeholders, etc.

The table below describes the on-site interview process and further identifies personnel, including their roles, who were interviewed, and/or provided information additional to that provided in the project description, Monitoring report /01/, and any supporting documents.

Sr. No.	Date	Name	Organization	Topic	Persons Interviewed
/1/	15/06/2022	Richard Cobbs	EcoGas Asia Ltd.	Project implementation and operation (Remotely)	Sanjay Kumar Agarwalla (Team Leader), Manas Halder (Trainee Assessor), and R V Nesari (Technical Expert)
/2/	15/06/2022	Kevin James	Climate Compass LLC	Project implementation and operation, monitoring procedure, data and information flow, CER calculation and MR preparation, QA/QC Procedures, Management, and operating system (Remotely)	
/3/	15/06/2022	Daragh Glynn	Brawa Consulting	Project implementation and operation	
/4/	15/06/2022	Oleksandr Potapenko	MBS	Project implementation and operation, monitoring procedure, data and information flow, data management, monitoring instrument maintenance and calibration, training of the PSL staff (Remotely)	
/5/	15/06/2022	Zakir Hassain	JGTDSL	Leak maintenance under safety and emergency situations	
/6/	15/06/2022	Sanoar Hossain.	JGTDSL	Leak maintenance under safety and emergency situations	
/7/	15/06/2022	Belayet Hossain	PSL	Project implementation and operation, monitoring procedure, data and information flow, data management, monitoring instrument maintenance, and calibration	
/8/	15/06/2022	Asma Haque	PSL	Project implementation and operation, monitoring procedure, data and information flow, data management, monitoring instrument maintenance, and calibration	
/9/	15/06/2022	Tanvir Ahmed	PSL	Project implementation and operation, monitoring procedure, data and	

Sr. No.	Date	Name	Organization	Topic	Persons Interviewed
				information flow, data management, monitoring instrument maintenance, and calibration	
/10/	15/06/2022	Md. Mohiuddin	PSL	Project implementation and operation, monitoring procedure, data and information flow, data management, monitoring instrument maintenance, and calibration	
/11/	15/06/2022	Subhashish Chandra Das	PSL	Project implementation and operation, monitoring procedure,	
/12/	15/06/2022	Md. Sazzad Hossain	PSL	Project implementation and operation, monitoring procedure	
/13/	15/06/2022	Md. Nur Alam	PSL	Project implementation and operation, monitoring procedure,	

The verification team has carried out on-site interviews to assess the information included in the monitoring report and monitoring measurement procedures adopted during the monitoring period. During the desk review, the relevant monitoring records were checked.

Through the review of validation reports, comparing the relevant evidence, and interviewing with the PP's representatives through on-site visit interviews, CCIPL has confirmed that the project is implemented in line with the registered PDD /B03/ and VCS PD /06/ during the monitoring period. There is no change in the project design, operation and monitoring plan.

## 2.4 Site Inspections

Carbon Check has conducted an on-site inspection to confirm all physical features of the project activity proposed in the registered PD are in place and that the project proponent has operated and correctly monitored all parameters of the project activity as per the registered CDM PDD and VCS PD during this monitoring period. A reasonable level of assurance has been maintained for verification as follows:

- 1) An assessment of the implementation and operation of the project activity as per the registered PDD and VCS PD
- 2) A review of information aggregating and reporting of the monitoring parameters
- 3) Interviews with relevant personnel to confirm that the operational and data collection procedures are implemented in accordance with the MP
- 4) A cross-check between product sales information provided in the MR and data from other sources.
- 5) A check of the monitoring equipment including calibration performance, and observations of monitoring practices against the requirements of the registered PDD and the applied monitoring methodologies
- 6) A review of calculations and assumptions made in determining the GHG data and ERs, and
- 7) An identification of QA/QC procedures in place to prevent, or identify and correct, any errors or omissions in the reported monitoring parameters

The total number of leaks identified, repaired, and then re-surveyed within the monitoring period was cross-checked by the verification team with the ER calculation spreadsheets /02/ and can be confirmed to be correct.

The verification team took note of paragraphs 26 and 27 of the Sampling Standard, version 09 which states the following:

Paragraph 26: The VVB may apply a sampling approach for on-site visits and/or on-site surveys as part of validation/verification, applying the “Guideline: Sampling and surveys for CDM project activities and programme of activities”, irrespective of whether the above-mentioned sampling plan exists or the project participants or the coordinating/managing entity have undertaken sampling surveys.

Paragraph 27: When the project participants or the coordinating/managing entity have not applied a sampling approach, the VVB may apply a sampling approach, choosing a different confidence/precision than the ones indicated in paragraph 11 above, provided that samples are randomly selected and are representative of the population.

As it is not possible to individually verify all the reported leaks, the verification team applied a sampling approach for the on-site assessment/inspection. The verification team then randomly selected 25 sample points for the on-site inspection. The detailed method/steps applied to randomly select the sample points out of the total leaks are provided below:

The verification team used an online Raosoft calculator to derive an appropriate initial number of samples for an on-site visit. The verification team has applied a 90/10 confidence/precision (assuming response distribution as 90%) and the sample size calculated is 25 and the same is conveyed to the PP in the verification audit plan. The verification team had also indicated in the verification audit plan, that during the on-site inspection if a discrepancy is identified in the selected samples, the verification team shall increase its sample size (applying the materiality concept in line with VVS for project activities, version 03.0).

During the assessment of sample points, as applicable, the verification team has conducted an on-site inspection and also a plausibility check of information provided in:

- i. Hard copy protocols
- ii. Data tags fixed on-site at every surveyed leak,
- iii. Leak report files,
- iv. ER calculation spreadsheets and HFS Data Log Files /15/.

All information of the selected sample points verified was consistent and plausible and thus no further samples were conducted by the verification team and the records of all the repaired leaks were acceptable to the verification team. The verification team carried out on-site interviews with representatives of PP to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable to the VCS.

## 2.5 Resolution of Findings

CCIPL, during this verification, identified issues related to the monitoring, implementation, or operation of the VCS project that could impair the capacity of the proposed VCS project to achieve project emission reductions or influence the reporting of emission reductions. CCIPL has identified and discussed these issues within the Verification report in Appendix 4.

- Clarification requests (CLs): Project reporting lacks transparency and further information is needed to determine if a material discrepancy is present.
- Corrective action requests (CARs): The VVB has identified a material discrepancy or non-conformance that the project proponent must address.

The verification team identified 04 CAR and 08 CLs. All CAR and CLs raised by Carbon Check during this verification have been resolved by the PP. If this was not completed, the ERs cannot be certified and recommended for issuance to the VCS Registry.

### 2.5.1 Forward Action Requests

Forward Action Request (FAR) is to be raised when the monitoring and reporting require attention and/or adjustment for the next verification period. FARs do not relate to VCS requirements for issuance of ERs achieved during subject monitoring.

No FAR was raised either during CDM validation or previous verifications. CCIPL has not raised any FAR during this verification.

## 2.6 Eligibility for Validation Activities

The project activity falls under sectoral scope 10 and the CCIPL is accredited for validation /verification of project activities under this scope.

# 3 VALIDATION FINDINGS

## 3.1 Participation under Other GHG Programs

This is a registered CDM project activity by UNFCCC (Reference number 10561). UNFCCC Clean Development Mechanism is approved by VCS Program and meets VCS criteria. VCS gap validation has been carried out by the VVB “KBS Certification Services Pvt. Ltd” issued on 16/06/2022 /06/.

### 3.2 Methodology Deviations

There is no methodology deviation identified during the current monitoring period.

### 3.3 Project Description Deviations

There is no project description deviation identified during the current monitoring period.

### 3.4 Grouped Project

This is not a group project hence this section is not applicable.

## 4 VERIFICATION FINDINGS

### 4.1 Project Implementation Status

The VCS project, “Reducing Gas Leakages within the Jalalabad Gas Distribution Network in Bangladesh” (VCS Project ID 2737) applies the CDM methodology AM0023 version 04 /B02/. This is the first monitoring report for the project under VCS.

CC IPL by means of on-site interviews and document review assessed that all the features (technology, project equipment, and monitoring) of the registered PDD are in place and that the project participants have operated the project as per the registered PDD /B03/.

The project aims to reduce gas leakages from components in the natural gas transmission and distribution system operated by Jalalabad Gas Transmission and Distribution System Limited (JGTDSL). The length of the JGTDSL natural gas transmission/distribution system is about 3,818 km. The Company carries out transmission and distribution of natural gas within the northeast part of Bangladesh in the districts of Sylhet, Moulvibazar, Habigonj, and Sunamgonj. The project reduces the leaks in the transmission/distribution system caused by normal component wear, thermal and vibrational stresses, and seasonal expansion/contraction cycling from ambient air temperature changes. The project implements advanced leak detection and repairs (LDAR) procedures to identify and implement various interventions to arrest leakage and thus reduce methane emissions at valves, insulating joints, pressure regulators, and other above-ground gas transmissions/distribution infrastructure.

As stated in the MR, the project is funded by Ecoeye Co., Ltd and the Korea Midland Power Co. Ltd. (KOMIPO), which provides survey equipment, repair materials, and project transportation. The PP (EcoGas Asia Ltd.) has hired Climate Compass LLC as a technical partner to help manage the project implementation and compliance with the PDD. 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. Climate Compass has hired Brawa Consulting to assist in the local project management and Prokaushali Sangsad Limited (PSL) to do 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, and operators in the field who take the appropriate measurements and log the data. The roles and responsibilities of each of the above parties are discussed and the respective documentation has been verified by the verification team. The training certificates of the monitoring personnel and calibration team are checked and verified by the verification team /23/ which could also be confirmed by the verification team during the on-site visit interviews.

A total of 10,905 gas leaks are included in the database of the current monitoring period. As per the registered PDD “The project boundary will be defined in detail in a database, of all the leaking components identified and repaired during the baseline study completed on the above-ground equipment in the JGTDSL gas system”. The PP had done the baseline survey from 20/01/2019 to 14/10/2019 and the components covered during the baseline survey form the project boundary. This is in line with the registered PDD and also the applied methodology. The verification team also noted that in some components, second or third leaks were identified during the monitoring and PP is claiming emission reductions only for the period after the monitoring date when the new leaks were repaired or after the date of re-repair for any re-emerged leaks till the end of the monitoring period. This is deemed acceptable to the verification team as these newly found leaks are within the project boundary.

The assessment of gas leak repairs made with advanced material was done by visual inspection of the quality of the repair of all leaks assessed during on-site inspection and interviews by the verification team. The check of the quality of the repairs was made through the leak flow identification made by the verification team by on-site inspection with the application of GS/HFS device and soap spray solution, monitoring records check for selected leaks via cross-checking of references /15/ as well as desk review and check of Emission Reduction calculation spreadsheet /02/.

The main monitoring equipment (four HFS) /17/ were available on-site and this can be confirmed by the verification team via visual observation of the equipment in the HFS storeroom during the on-site visit interviews.

The start date of operation of the project activity was 20/01/2019 when the initial baseline study was undertaken. The initial baseline study and resulting repairs started before the project was registered as a CDM project and were completed by 14/10/2019 /12/. This timeline can be confirmed as correct via interviews held with Mr. Tanvir Ahmed (PSL) and Mr. Volodymyr Potapenko (MBS), as well as through the analyses of data on the date of baseline measurements in ER calculation spreadsheet /02/.

The project activity is processed using multiple steps for every individual leak surveyed, starting with the leak identification by an LDMT, the subsequent repair of these detected leaks by repair teams, and, finally, the LDMT undertakes additional measurements to monitor the effectiveness of the repairs undertaken. If required, re-repair steps are included in this process chain. The major measurement devices applied are a set of up to four identical Hi-Flow Samplers obtained from the US-based distributor Heath Consulting, where the proper operation and maintenance of these Hi-Flow Sampler devices, including staff training, is supervised and controlled by MBS. The HFS, a product of Bacharach Inc., is a machine designed to detect and measure leaks in gas infrastructure. The Hi-Flow Sampler, a high-volume sampler, represents a technology directly referenced in the applied monitoring methodology AM0023, version 04 /B02/ and the registered CDM PDD /B03/ for use in quantifying emissions. The device operates by capturing all emissions from a leaking component to accurately quantify leak flow rates. Leak emissions, plus a large volume sample of the air around the leaking component, are pulled into the instrument through a vacuum sampling hose. Hi-Flow Samplers are equipped with dual hydrocarbon detectors that measure the concentration of hydrocarbon gas in the captured samples, as well as the ambient hydrocarbon gas concentration. Sample measurements are corrected for the ambient hydrocarbon concentration, and the leak rate is calculated by multiplying the flow rate of the measured sample by the difference between the ambient gas concentration and the gas concentration in the measured sample. Methane emissions are obtained by calibrating the hydrocarbon detectors to a range of concentrations of methane in the air. Hi-Flow Samplers are equipped with special attachments designed to ensure complete emissions capture and to prevent interference from other nearby emissions sources. The hydrocarbon sensors are used to measure the exit concentration in the air stream of the system. The Hi-Flow Sampler automatically accounts for standard temperature and pressure (i.e., 0 degrees Celsius and 101.3 kPa) in its leak flow rate measurements /19/. The normalized results of the measured leaks are  $\pm 10\%$  accurate /17/.

The data management team coordinates the process of detecting, repairing, and monitoring leaks involving thorough management of data through different media (weather-proof data tags, hard copy protocols, leak report files, data log files, and ER calculation spreadsheet) /15/ /02/. In this respect for every individual leak, the ER calculation basically starts with the first monitoring after this individual leak repair has been successfully undertaken (or with the start date of the monitoring period, whichever is later), and ends with the end date of the monitoring period. For this monitoring period (from 20/01/2019 to 30/07/2020) a total number of 10,905 leaks have been included in the data system of the project activity.

During the desk review process and on-site visit, it could be confirmed that the implementation and the operation of the project activity are consistent with the approved baseline and monitoring methodology AM0023, version 04 /B02/ and the registered CDM PDD /B03/. Also, the project operated continuously during the monitoring period with a steady supply of natural gas without any outages as confirmed by JGTDSL /22/.

Technical specifications of the Gas Surveyor and High Flow sampler were checked with the websites <https://www.manualslib.com/manual/537303/Bacharach-Hi-Flow-Sampler.html> and <http://www.manualsdir.com/manuals/737801/heath-consultants-gasurveyor-500-series.htmlseries.html>. The age and average lifetime of the material used in the repair were checked with the letter from MBS Ltd, which confirms that the repair materials used in the project are designed to and capable of ensuring that the leaks mostly do not reappear within the 10 years of the project crediting period /13/.

A complete set of monitoring data as specified in the registered CDM PDD /B03/ have been provided to the verification team relevant for the monitoring period from 20/01/2019 to 30/07/2020 (including both days) and all necessary evidence, data files, and underlying documents have been transparently provided to the verification team, such as ER calculation spreadsheet /02/, Leak Report Files, Hard Copy Protocols and Data Log Files of the Hi-Flow Sampler /15/.

Furthermore, the verification team noted that there were a few risers for which the gas supply was stopped for some period during the monitoring period or during the monitoring, and PP was not able to reach a few of them. In all such cases of outages, PP has not considered these risers for emission reductions for the full monitoring period which is a conservative approach and hence deemed acceptable to the verification team.

The verification team has cross-checked whether the leak tags correspond to the photos of leak tags made and provided in the excel sheets - leak report files /15/, and also whether the hand-written information entered by the operator provided in the leak tags such as:

Leak ID number on leak tags

Date of baseline leak flow measurement (before the repair), the date of leak flow measurement after leak repair (or also re-repair, if any), and the date of leak flow monitoring measurement(s)

The values of leak flow on the date of baseline leak measurement, on the date of leak flow measurement after leak repair (or also re-repair, if any), and on the date of monitoring measurement(s)

The HFS number applied on the date of baseline leak flow measurement, the date of measurement after leak repair (or also re-repair, if any) and the date of leak monitoring measurement(s), and the records numbers in HFS memory corresponding to each leak flow measurements

The name of the operator who has performed each corresponding leak flow measurement corresponds to the information contained in (i) hard copy protocols (ii) leak report files, (iii) ER calculation spreadsheet, and (iv) Data Log Files, as appropriate, for each physically surveyed leak.

The total amount of GHG reductions calculated for this monitoring period from 20/01/2019 to 30/07/2020 including both days is 1,056,658 tCO<sub>2e</sub>.

The verification team confirms that an appropriate approach has been chosen by the PP to ensure that within the monitoring period, the claim for emission reductions for any new leaks that have been identified during monitoring is restricted to the period after the monitoring date when the new leaks were repaired or after the date of re-repair for any re-emerged leaks till the end of the monitoring period (i.e. 30/07/2020).

Following the decision tree of leaks inclusion in the project activity (page 25 of the CDM PDD /B03/) when equipment ceases to function and leaks in emergency situations, these leaks will be repaired by an emergency repair team that works completely independent of the operation of the project activity. The corresponding procedures are described in the MR /1/. No emergency leaks and cases with replacement of equipment were included in the emission reduction calculation spreadsheet which could be confirmed through interviews with the representatives of JGTDSL and PSL and also a declaration provided by JGTDSL /16/ and a sample log of emergency repairs maintained by JGTDSL /11/. During each monitoring visit, the operator checks the current configuration of the equipment against the photographs and technical schematics completed during the baseline study. Database entries representing leaks that have been shut off are no longer used to calculate emission reductions. Thus, it can be confirmed that emission reductions resulting from the leaks repaired before the list of scheduled equipment to be replaced in the baseline scenario are not claimed in the ER calculation spreadsheet. Following the decision tree of leaks inclusion in the project activity, the leak which can be identified and repaired with materials and know-how available before the CDM Project (like a simple tightening of a loose-fitting or connection) has not been included in the CDM Project Database which could be confirmed by the interviews made with the members of LDMT and representative of MBS and PSL. Based on the visual observation of the sample leaks during the on-site assessment of the project performed, the verification team has confirmed the usage of only advanced repair materials for all leaks repaired as part of the project activity.

The project activity complies with all the national statutory requirements /21/.

CC IPL's verification team considers the project description to be complete and accurate.

CC IPL's verification team confirms that the project activity is implemented within the boundary of the project activity as described in the registered PDD /B03/ and the implementation and operation of the project activity have been conducted in accordance with the description contained in the registered PDD.

During the on-site interviews verification, QA/QC procedures were identified which demonstrate that: the operational and management system of the project is in place; data were centralized; monitoring data were crosschecked, records were stored and confirmation that all operational staff was trained before taking up positions. The verification team thus confirmed that the monitoring of the project activity has been implemented in accordance with the monitoring plan in the registered PDD.

The registered PDD clearly describes the monitoring and responsibility of monitoring done by PP. During the on-site interviews, monitoring, data collection, and reporting procedures were confirmed with the relevant staff and through document review of samples of all relevant records.

All the ex-ante parameters which are used in the calculation of emission reductions are consistent with the CDM PDD / VCS PD. It is confirmed that the ex-ante parameters mentioned in section 4.1 of the MR /01/ are in line with the parameters mentioned in section B.6.2 of the registered PDD. All the ex-post parameters have been monitored as per the monitoring plan and presented in section 4.2 of the MR /01/.

In summary, the monitoring period is reasonable, and the operation of the project activity is in accordance with the registered PDD /B03/. There were no changes observed from the technology stated during the validation. CCIPL's verification team considers the project description to be complete and accurate.

## 4.2 Safeguards

### 4.2.1 No Net Harm

Not applicable as the project does not pose any potential negative environmental and socio-economic impact.

### 4.2.2 Local Stakeholder Consultation

The local stakeholder consultation meetings were held during the CDM validation. Also, ongoing communication with local stakeholders has been stated in section 2.2 of the MR /01/. To undertake the monitoring activity, the monitoring teams visit every riser included in the database during each monitoring period. In the process of conducting the monitoring, they regularly meet the customer and explain that they are repairing and maintaining leaks and receive regular feedback from the customers. In addition, the gas company maintains a customer service line and any issues that arise are passed to the teams as needed. This was cross-checked during OSV interview and customer complaint log book. Hence, the verification team deemed the ongoing communication with local stakeholders appropriate.

## 4.3 AFOLU-Specific Safeguards

This is a non-AFOLU project and hence this section is not applicable.

## 4.4 Accuracy of GHG Emission Reduction and Removal Calculations

The equations and choices provided in the methodology and all other methodological tools are correctly quoted in the MR /01/. The emission reductions of the project are calculated using the formulae mentioned in the applied methodology AM0023 version 04 /B02/. The verification team has reviewed the emission reduction spreadsheets (ER sheets) and checked all the formulae and found they are correct and are in accordance with the monitoring plan of the registered PDD and the applied monitoring methodology.

The verification team checked the Emission Reduction calculation sheet /02/ and confirms that the equations used have been correctly applied and as per the selected methodologies AM0023 "Leak

detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities”, version 04 /B02/ and the registered CDM PDD /B03/.

### Baseline emissions:

Baseline emissions are determined based on the quantity of CH<sub>4</sub> emitted through physical leaks that are detected and repaired as part of the project activity (i.e., by the advanced LDAR program).

Option 2 of the methodology AM0023 /B02/ has been chosen to measure the flow rate of the physical leaks through the use of a Hi-Flow Sampler. In addition, the baseline emissions are capped to the baseline emission level of the first crediting year, which is again as per the methodology.

The baseline emissions are calculated as follows:

$$BE_y = \min \left\{ BE_1, ConvFactor \times \sum_j [F_{CH_4,j} \times T_{j,y} \times (1 - UR_j)] \times GWP_{CH_4} \right\}$$

With,

$$BE_1 = ConvFactor \times \sum_j [F_{CH_4,j} \times T_{j,y=1} \times (1 - UR_j)] \times GWP_{CH_4}$$

Where:

BE<sub>1</sub> = Baseline emissions for the first crediting year of the crediting period (tCO<sub>2e</sub>).

BE<sub>y</sub> = Baseline emissions for crediting year y (tCO<sub>2e</sub>)

ConvFactor = Conversion factor to convert Nm<sup>3</sup> CH<sub>4</sub> into tCH<sub>4</sub>. The Hi-Flow sampler automatically accounts for standard temperature and pressure in data readings; as such this factor amounts to 0.0007168 tCH<sub>4</sub>/Nm<sup>3</sup> CH<sub>4</sub> (i.e., 0 degree Celsius and 101.3 kPa).

*j* = All physical leaks that are included in the project activity for which physical leaks were detected and repaired and which would leak in the baseline scenario during the crediting year y.

F<sub>CH<sub>4</sub>,j</sub> = Measured flow rate of methane for the physical leak *j* from the leaking component (Nm<sup>3</sup> CH<sub>4</sub>/h)

UR<sub>j</sub> = Uncertainty range for the flow rate measurement method applied to physical leak *j*. The uncertainty of the measurement is taken into account by using the flow rate at the lower end of the uncertainty range for the measurement at a 95% confidence interval for baseline emissions from leaks

- $T_{j,y}$  = 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)
- $GWP_{CH_4}$  = The global warming potential for methane valid for the commitment period (tCO<sub>2e</sub>/tCH<sub>4</sub>). After the commitment period, this value may be revised based on any decision by the CMP.

Uncertainty is calculated using the following formula:

$$UR_j = \frac{\sqrt{(UR_1 * x_1)^2 + (UR_2 * x_2)^2 + \dots + (UR_n * x_n)^2}}{x_1 + x_2 + \dots + x_n}$$

Where

- $UR_j$  = the percentage uncertainty in the sum of the quantities (half the 95% confidence interval divided by the total (i.e. mean) and expressed as a percentage);
- $x_n$  and  $UR_n$  = the uncertain quantities and the percentage uncertainties associated with them, respectively.

(Note: “n” in this case refers to each recorded leak rate of each component surveyed)

For all physical leaks detected, the following assumptions are applied in calculating the baseline emissions:

- For components where no physical leaks were detected at the initial baseline survey and where the physical leak(s) were detected during a subsequent survey, baseline emissions shall be accounted from the moment when the leak was detected;
- Baseline emissions from a specific leak  $j$  or a specific component  $r$  are included in the calculations until whichever of the following occurs first:
  - The component concerned is replaced for a non-leak-related reason (i.e. it breaks down); or
  - The end of the last crediting period of the overall project activity; or
  - The maximum period for which a specific leak can be accounted for emission reductions is over. This maximum period is the end of the crediting period (i.e., 10 years).

Further, the information provided in the monitoring report has been cross-checked with other sources such as detailed log sheets of all leaks / 15/, to confirm the correctness and for plausibility check. The calculation of baseline GHG emissions has 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 factors, 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.

### Project emissions:

For project emissions, it is required to include physical leaks that take place on components included in the project boundaries in the following cases:

- If a repair of a physical leak ceases to function, for as long as it is not repaired again; or
- If a new physical leak is detected in a component that was part of the initial baseline survey and for which no physical leak was detected during that survey, as long as that physical leak is not repaired.

Project emissions are calculated using the following formula (Option 2):

$$PE_y = ConvFactor \times \sum [F_{CH_4,z} \times T_z \times (1 - UR_z)] \times GWP_{CH_4}$$

Where:

PE<sub>y</sub> = Project emissions in crediting year y ((tCO<sub>2e</sub>))

*ConvFactor* = Conversion factor to convert m<sup>3</sup> CH<sub>4</sub> into Tch<sub>4</sub>. The Hi-Flow sampler automatically accounts for standard temperature and pressure in data readings; as such this factor amounts to 0.0007168 tCH<sub>4</sub>/Nm<sup>3</sup> CH<sub>4</sub> (i.e., 0 degree Celsius and 101.3 kPa).

*z* = All leaks that are accounted for as project emissions during the crediting year y

*F<sub>CH4</sub>* = Measured leak flow rate of methane for the physical leak z from the leaking component (m<sup>3</sup> CH<sub>4</sub>/h)

*UR<sub>z</sub>* = Uncertainty range for the flow rate measurement method applied to physical leak z. The uncertainty of the measurement is taken into account by using the flow rate at the upper end of the uncertainty range for the measurement at a 95% confidence interval for project emissions from leaks.

*T<sub>z</sub>* = The time the relevant component has been leaking during the crediting year y

*GWP<sub>CH4</sub>* = Global warming potential of methane valid for the commitment period ((tCO<sub>2e</sub> /tCH<sub>4</sub>)).

The following assumptions are made in the calculation of project emissions:

If a repair of a physical leak ceases to function, it is conservatively assumed that the leak resumed either:

- At the same flow rate that was measured before its repair when using only leak detection equipment;
- At the newly measured leak rate if the leak is re-measured using leak measurement equipment at the time of monitoring (in case of Option 2);

It is further assumed that the leak resumed on the day when the leak was last checked and confirmed not to leak and that it continued to leak for the entire time since that date. Any new leaks or leaks that reappear are immediately repaired. For this reason and the fact that finding and repairing gas leaks does not create emissions, PP assumed that there are no project emissions and has not calculated it.

For components where no physical leak was detected at the initial baseline survey and where the physical leak(s) were detected during subsequent surveys, project emissions from these components shall be accounted since the moment when the leak was detected.

Project emissions from a specific physical leak, are included in the calculations until whichever of the following are earlier:

The date of any repair of the physical leak as long as the repair does not cease to function; or the equipment concerned is replaced (i.e. it breaks down).

During the current monitoring period, there are no project emissions for the project activity.

As per the applied methodology AM0023, version 04 /B02/ no leakage effects are accounted for. Thus, there will no leakage emissions from the project activity.

According to the applied methodology, the emission reductions are calculated as:

$$ER_y = BE_y - PE_y$$

From the above-calculated value of  $BE_y$  and  $PE_y$ , the total emission reductions are:

$$ER_y = 1,056,658 \text{ tCO}_2\text{e}$$

The verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence, and calculations are done in accordance with the pre-defined formulae from registered PDD /B03/. As the measuring instruments directly read out the amount of methane leakage rate per unit time, the “sample gas methane concentration” and “ambient air methane concentration” parameters are rendered redundant in the calculation of ER. The total number of emission reductions achieved during the monitoring period is 1,056,658 tCO<sub>2</sub>e.

Emission reductions have been calculated in accordance with the applied methodology AM0023, version 04 /B02/, registered PDD /B03/ and VCS PD /06/. The PP has used monitored data and ex-ante fixed data including default values as mandated/permitted by the applied methodology. The values used for the calculation of GHG emission reductions have been thoroughly checked by the verification team and were found appropriate and correct.

**Table 2:- Parameters Determined ex-ante**

The following parameters are determined ex-ante and mentioned in the CDM PDD / VCS PD:

Parameter	Unit	Value	Assessment
GWP <sub>CH4</sub>	tCO <sub>2</sub> e/tCH <sub>4</sub>	28	Fixed ex-ante in the PDD from the 5 <sup>th</sup> Assessment Report of the IPCC
ConvFactor	tCH <sub>4</sub> / m <sup>3</sup> CH <sub>4</sub>	0.0007168	The value of the parameter is fixed ex-ante in the PDD.  As per the methodology, the leak flow rate (FCH <sub>4,j</sub> ) and conversion factor (ConvFactor) should be reduced to the same reference conditions. The verification team has checked that the Hi-Flow Samplers automatically account for standard temperature and pressure (i.e., 0 degree Celsius and 101.3 kPa) in its leak flow rate measurements.

The spreadsheet submitted by the PP clearly and transparently mentions the values of the data parameters used for the calculation of emission reductions. The input values have been verified from reliable and authentic sources including monitoring records, MR /01/, and applied methodology /B02/. The emission reductions calculated were compared with the emission reduction spread sheet /02/ and found to be correct. No significant reporting risks have been identified for the data reported.

The details of monitoring parameters used for the calculation of emission reductions are provided below:

**Table 3:- Parameters monitored ex-post**

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of PDD):	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) ( $T_{j,y}$ )

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Measuring frequency/Time Interval:	Ongoing throughout the monitoring period and the final value calculated at the end of the monitoring period
Reported value:	Multiple Values for each leak 'j' (Please refer to the ER spread sheet for each leak /02/)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	This is a calculated parameter. Not applicable
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Not applicable
Calibration frequency /interval: Is it as per monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Not applicable
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not applicable
Company performing the calibration (internal or external calibration):	Not applicable
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not applicable
Is (are) calibration(s) valid for the whole reporting period?	Not applicable
If applicable, has the reported data been cross-checked with other available data?	The reported data on the hours of operation, during which each leak is venting gas was verified by examination of the formula for the calculation of hours between each corresponding date of leak flow measurement in ER calculation spreadsheet /02/. It can be confirmed that the final calculation of hours of operation, during which each leak is venting gas was

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
	done in the correct manner in line with procedures defined in PDD /B03/, and the hours of shut-offs where the leaks ceased to operate were appropriately subtracted from the total amount of hours of operation. During the desk review of the leak reports /15/ and on-site surveys for the sampled leaks, the verification team has come to the conclusion that all the leak repairs were made with advanced repair material, as specified in PDD. It can be confirmed that there have been no hours of operation calculated for the equipment replaced for a non-leak related reason (i.e., when it breaks down), or when replacement of the equipment is made.
How were the values in the monitoring report verified?	The values were verified with the ER spreadsheets. 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
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures the correct transfer of data and reporting of emission reductions, and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of PDD):	The temperature and pressure at the point at the time of measurement  Temperature and pressure of natural gas (°C and bar)
Measuring frequency/Time Interval:	As and when a leak is measured using HFS
Reported value:	The Hi-Flow™ Sampler automatically adjusts readings to standard temperature and pressure (0°C and 101.3

Monitoring Parameter Requirement	Assessment/ Observation by the VVB								
	kPa) and is integrated into the results from the Hi-Flow sampler device /19/. The verification team confirms that the values are automatically corrected in accordance with the HFS manual. This is in line with the monitoring plan in PDD /B03/ and monitoring methodology /B02/.								
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes								
Details of monitoring equipment:	<table border="1"> <tr> <td data-bbox="769 640 1024 695">Instrument Name</td> <td data-bbox="1024 640 1393 695">Hi-Flow Sampler</td> </tr> <tr> <td data-bbox="769 695 1024 749">Manufacturer</td> <td data-bbox="1024 695 1393 749">Heath Consultants</td> </tr> <tr> <td data-bbox="769 749 1024 951">Serial Numbers</td> <td data-bbox="1024 749 1393 951">NQ1000, NQ1002, NQ1003, NQ1005, NQ1007, NQ1008, NQ1009, NQ1011, MN1032, LP1002, MP1032, MN1018, MP1006, LX1011, LU1001</td> </tr> <tr> <td data-bbox="769 951 1024 1005">Accuracy Class</td> <td data-bbox="1024 951 1393 1005">+/-10%</td> </tr> </table>	Instrument Name	Hi-Flow Sampler	Manufacturer	Heath Consultants	Serial Numbers	NQ1000, NQ1002, NQ1003, NQ1005, NQ1007, NQ1008, NQ1009, NQ1011, MN1032, LP1002, MP1032, MN1018, MP1006, LX1011, LU1001	Accuracy Class	+/-10%
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Accuracy Class	+/-10%								
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Yes								
Calibration frequency /interval:  Is it as per monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Every 30 days while in use								
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Yes								
Company performing the calibration (internal or external calibration):	Calibration of the HFS was done internally by the trained personnel of PSL by MBS /18/ /23/. The competence of the calibrating persons could be confirmed during the								

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
	on-site interviews by the verification team including a live demonstration of the same.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is (are) calibration(s) valid for the whole reporting period?	Yes
If applicable, has the reported data been cross-checked with other available data?	-
How were the values in the monitoring report verified?	-
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	-
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not applicable

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of PDD):	The uncertainty range for the measurement method applied to leak j (UR <sub>j</sub> )
Measuring frequency/Time Interval:	As and when a leak is measured using HFS
Reported value:	Multiple Values for each leak "j" (PI refer to the ER spread-sheet for each leak)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Details of monitoring equipment:	The URj is calculated using leakage flow rates and the respective UR of the Hi-Flow sampler used for the leak. Leaks are measured using the Hi-Flow samplers. The readings as per the operator's manual are $\pm 10\%$ accurate /17/. Having applied uncertainty values of 10% for each individual HFC measurement undertaken (as given as "accuracy of calculated leak rate" in the HFS manual /17/), a total uncertainty of 0.00122093 had been calculated correctly by the PP based on 2000 IPCC Good Practice Guidance (Chapter 6 and the registered PDD). The calculation procedure is given as separate sheets attached to the CER calculation spreadsheets /2/ which have been checked and found to be correct by the verification team.
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Yes
Calibration frequency /interval:  Is it as per monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Every 30 days while in use
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Yes
Company performing the calibration (internal or external calibration):	Calibration of the HFS was done internally by the trained personnel of PSL by MBS /18/ /23/. The competence of the calibrating persons could be confirmed during the on-site interviews by the verification team including a live demonstration of the same.
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes
Is (are) calibration(s) valid for the whole reporting period?	Yes

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
If applicable, has the reported data been cross-checked with other available data?	The reported data was verified by examination of the formula for the calculation in ER calculation spreadsheet /2/.
How were the values in the monitoring report verified?	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 has been checked by the audit team for all the leaks.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures the correct transfer of data and reporting of emission reductions, and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	Not Applicable

Monitoring Parameter Requirement	Assessment/ Observation by the VVB				
Data / Parameter: (as in monitoring plan of PDD):	The leak flow rate of methane for leak (j, z) from the leaking component ( $F_{CH_4,j}/F_{CH_4,z}$ )				
Measuring frequency/Time Interval:	As per the applied methodology and the registered PDD, it is to be monitored annually and this parameter has been measured once during the monitoring period.				
Reported value:	Multiple Values for each leak 'j' and 'z' (Please refer to the ER spread sheet for each leak /2/)				
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes				
Details of monitoring equipment:	<table border="1"> <tr> <td><b>Instrument Name</b></td> <td>Hi-Flow Sampler</td> </tr> <tr> <td><b>Manufacturer</b></td> <td>Heath Consultants</td> </tr> </table>	<b>Instrument Name</b>	Hi-Flow Sampler	<b>Manufacturer</b>	Heath Consultants
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<b>Manufacturer</b>	Heath Consultants				

Monitoring Parameter Requirement	Assessment/ Observation by the VVB	
	<b>Serial Numbers</b>	NQ1000, NQ1002, NQ1003, NQ1005, NQ1007, NQ1008, NQ1009, NQ1011, MN1032, LP1002, MP1032, MN1018, MP1006, LX1011, LU1001
	<b>Accuracy Class</b>	+/-10%
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment, does the monitoring equipment represent good monitoring practise?	Yes	
Calibration frequency /interval:  Is it as per monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Every 30 days while in use	
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Yes	
Company performing the calibration (internal or external calibration):	Calibration of the HFS was done internally by the trained personnel of PSL by MBS /18/ /23/. The competence of the calibrating persons could be confirmed during the on-site interviews by the verification team including a live demonstration of the same.	
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Yes	
Is (are) calibration(s) valid for the whole reporting period?	Yes	
If applicable, has the reported data been cross-checked with other available data?	Yes, the value of the parameter has been cross-checked with the Hi-Flow sampler readings records for the baseline survey period and also during the monitoring	
How were the values in the monitoring report verified?	The values were verified with the raw data sheet and calculations in the ER spread-sheets	

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
	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 leaks j and z from the complete data for the leaks.
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures the correct transfer of data and reporting of emission reductions, and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
Data / Parameter: (as in monitoring plan of PDD):	Capped quantity of the baseline emissions, defined as the baseline emissions for the first year of the crediting period (BE <sub>CAP</sub> )
Measuring frequency/Time Interval:	Monitored baseline emissions during the first year of the first crediting period
Reported value:	1,124,521 per year (1,719,131 for 558 days)
Is measuring and reporting frequency in accordance with the monitoring plan and monitoring methodology? (Yes / No)	Yes
Details of monitoring equipment:	Not applicable
Is accuracy of the monitoring equipment as stated in the PDD? If the PDD does not specify the accuracy of the monitoring equipment,	Not applicable

Monitoring Parameter Requirement	Assessment/ Observation by the VVB
does the monitoring equipment represent good monitoring practise?	
Calibration frequency /interval: Is it as per monitoring methodology /CDM EB guidance / local or national standards / manufacturers specification	Not applicable
Is the calibration interval in line with the monitoring plan of the PDD? If the PDD does not specify the frequency of calibration, does the selected frequency represent good monitoring practise?	Not applicable
Company performing the calibration (internal or external calibration):	Not applicable
Did calibration confirm proper functioning of monitoring equipment? (Yes / No):	Not applicable
Is (are) calibration(s) valid for the whole reporting period?	Not applicable
If applicable, has the reported data been cross-checked with other available data?	Not applicable
How were the values in the monitoring report verified?	The values were verified in the ER spread sheets
Does the data management (from data generation to emission reduction calculation) ensure correct transfer of data and reporting of emission reductions and are necessary QA/QC processes in place?	Yes, the data management ensures the correct transfer of data and reporting of emission reductions, and all necessary QA/QC processes are in place.
In case only partial data are available because activity levels or non-activity parameters have not been monitored in accordance with the registered monitoring plan, has the most conservative assumption theoretically possible been applied or has a request for deviation been approved?	NA

The verification team confirms that all parameters are used correctly in the calculations, all results are verifiable and transparent, all assumptions are described and based on verifiable evidence, and calculations are done in accordance with the pre-defined formulae from registered PDD /B03/. The total number of emission reductions for the monitoring period (20/01/2019 to 30/07/2020) is 1,056,658 tCO<sub>2e</sub>.

The verification team has checked and confirmed the calculations in the spreadsheet and found them to be accurate. The monitoring report is supported by the emission reduction spreadsheet. The consistency and formula were verified and found to be accurate.

Also, it is noted that any new leaks or leaks that reappear are immediately repaired. For this reason and the fact that finding and repairing gas leaks does not create emissions, PP assumed that there are no project emissions and has not calculated it. Hence, the parameters  $T_z$  and  $UR_z$  have not been monitored by the PP. which is deemed reasonable and acceptable.

#### 4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

When verifying the report emission reduction, CCIPL ensured that there was a clear audit trail that contained the evidence and records that validate the stated figures. All source documents that form the basis for assumptions and other information underlying the GHG data are shown above.

When assessing the audit trails, CCIPL also examined:

1. Whether sufficient evidence was available, both in terms of frequency and in covering the full monitoring period
2. The source and nature of the evidence
3. If comparable information was available from sources other than that used in the monitoring report, CCIPL cross-checked the monitoring report against the other sources to confirm that the stated figures were correct. The sources and the data referenced are shown in Appendix 1 below.

The verification team confirms that all the monitoring equipment has been provided to adhere to the monitoring requirement as specified in the project activity as per the registered monitoring plan.

All Hi-Flow Samplers and Gasurveyors are calibrated to ensure accuracy in their measurements. The calibration is done as per the PDD at a 30-day and one-year frequency for HFS and GS respectively by certified and trained staff on the calibration procedure /18/ /23/. The verification team confirms that HFS and GS used for monitoring leaks were duly calibrated at the time of their usage for the current monitoring period. The Verification team checked the calibration records and the same was found to be satisfactory /20/.

CCIPL also assessed that the data collection system met the requirements of the monitoring plan as per the applied methodology.

Proper data management inclusive of data acquisition and aggregation, data management system is being followed for the project activity.

The monitoring personnel at the site are well trained and follow reproducible routines. Thus, they are competent to carry out the relevant tasks with sufficient accuracy.

## 4.6 Non-Permanence Risk Analysis

Not Applicable

# 5 VERIFICATION CONCLUSION

The Project Participant, EcoGas Asia Limited, has commissioned the VVB, Carbon Check (India) Private Ltd. to perform a verification of the VCS Project Activity “Reducing Gas Leakages within the Jalalabad Gas Distribution Network in Bangladesh”. This report summarises the findings of the verification of the project, performed based on VCS criteria, as well as criteria given to provide for consistent project operations, monitoring, and reporting.

The verification process was performed based on all guidelines and criteria as provided in VCS Standard version 4.3 /B01-a/, VCS Program Guide version 4.2/B01-b/, VCS Validation and Verification Manual version 3.2 /B01-c/, and Registration & Issuance Process version 4.2 /B01-d/.

The selected baseline and monitoring methodology (AM0023, Version 04) applies to the project and is correctly applied.

The verification team confirms that the project has been implemented in accordance with the project description /6/.

Verification period: From 20/01/2019 to 30/07/2020 (both days inclusive)

Verified GHG emission reductions and removals in the above verification period:

Year	Baseline emissions or removals (tCO <sub>2</sub> e)	Project emissions or removals (tCO <sub>2</sub> e)	Leakage emissions (tCO <sub>2</sub> e)	Net GHG emission reductions or removals (tCO <sub>2</sub> e)
20/01/2019 to 30/07/2020	1,056,658	0	0	1,056,658
<b>Total</b>	<b>1,056,658</b>	<b>0</b>	<b>0</b>	<b>1,056,658</b>

The verification team is of the opinion that the project has been implemented in accordance with the registered project description, the monitoring plan complies with the approved monitoring methodology, the monitoring complies with the monitoring plan, and the monitored data and calculation of ERs are assessed and confirmed as correct.

Therefore, CCIPL hereby certifies and requests the issuance of, the reported ERs during the monitoring period of 20/01/2019 to 30/07/2020 amounting to 1,056,658 tCO<sub>2</sub>e to the VCS Registry.

## APPENDIX 1.1: REFERENCE DOCUMENTS

Ref	Document
/01/	<ol style="list-style-type: none"> <li>1. Monitoring report version 1, dated 29/04/2022</li> <li>2. Monitoring report version 3, dated 18/08/2022</li> </ol>
/02/	ER sheet corresponding to: <ol style="list-style-type: none"> <li>1. /01-1/</li> <li>2. /01-2/</li> </ol>
/03/	Letter from PSL confirming the start date (20/01/2019) of baseline survey dated 17/08/2022
/04/	Proof of project ownership complying with section 3.6.1 of VCS Standard version 4.3 (Agreement between EcoGas Asia, Ltd., Climate Compass, and Brawa Consulting dated 03/06/2019)
/05/	Certificate of incorporation of a Labuan company issued by Labuan Financial Services Authority dated 25/10/2018
/06/	VCS PD for the “Reducing Gas Leakages within the Jalalabad Gas Distribution Network in Bangladesh” version 5.2, dated 14/08/2022, and its corresponding validation report version 03, dated 24/08/2022
/07/	Map – Transmission and distribution pipeline of JGTDSL
/08/	“Gas leak project service agreement” / contract between EcoGas Asia Ltd, Climate Compass LLC, Brawa Consulting Ltd, PSL and C-Quest
/09/	Organization structure for the project activity
/10/	Feasibility study report conducted from 20th to 23rd February 2018
/11/	Evidence for the meth applicability criteria: <ul style="list-style-type: none"> <li>- During the last three years before the implementation of the project activity, no advanced LDAR program was in place to address physical leakage from components that are included in the project boundary – self-declaration letter from PSL dated 13/09/2021</li> <li>- The project only addresses components that were included in the project boundary at the validation of the project activity. For instance, the project boundary will not include new sections of the distribution network. – self-declaration letter from PSL dated 13/09/2021</li> <li>- Physical leaks detected and repaired as part of the current maintenance programme are not covered by the CDM project activity. The leaks repaired under current practices by the Emergency Repair team are excluded from the project – self-declaration letter from PSL dated 13/09/2021</li> <li>- Physical leaks that can be repaired by tightening/re-greasing (incl. connectors and plug valves steams) or by similar measures are not covered by the project activity – self-declaration letter from PSL dated 13/09/2021</li> <li>- Log of the emergency repair and replacements done as a result of a failed part</li> </ul>
/12/	Summary report letter from MBS for the project monitoring including inspection visits and baseline study database and monitoring database, dated 01/08/2022
/13/	Letter from MBS regarding the lifetime of the repair materials used in the leak repairs, dated 17/05/2022
/14/	Log of the materials used for leakage repairing using advanced LDAR
/15/	Detailed log sheets of all leaks with leak code, photographs, and GPS coordinates the leaks detected, measurements were done following with repairs carried out (along with all relevant

	details as stated under bullet points 1 to 11 under step 2 in section B.6.1 of the PDD: like along with the records of the downloaded data taken from the memory of HFS photographs, tags, handwritten records with raw data, etc.)
/16/	Letter provided by the gas company confirming that no leaks scheduled for replacement or emergency repair were included in the emission reduction calculation spreadsheet, dated 07/09/2022
/17/	Technical specifications and manuals for the Hi-Flow Samplers and GMI Gas surveyor (500 Series) and Photographs of the HFS and GS used during the monitoring period
/18/	Deed concerning training to perform the calibration of HFS dated 24/11/2021
/19/	Evidence to confirm the Hi-Flow Sampler automatically accounts for standard temperature and pressure (i.e., 0 degrees Celsius and 101.3 kPa) in its leak flow rate (FCH <sub>4,j</sub> ) measurements (HFS calibration memo issued by Heath Consultants dated 21/03/2008)
/20/	Calibration records for all the Hi-Flow Sampler and GS used during the monitoring period
/21/	Statutory Documents: <ul style="list-style-type: none"> <li>- Natural Gas Safety and Security Law</li> <li>- Gas distribution rules (Domestic) &amp; (Industry)</li> <li>- Gas Act</li> <li>- Gas Marketing Law</li> </ul>
/22/	Letter from JGTDSL confirming no system outages in gas supply during the monitoring period, dated 07/09/2022
/23/	Training-related letters and certificates for competence of the personnel involved in the monitoring issued by MBS
/24/	Letter from PSL demonstrating number for employment generated by the project dated 21/06/2022

## APPENDIX 1.2: BACKGROUND DOCUMENTS


Ref	Document
/B01/	VCS Requirements <ol style="list-style-type: none"> <li>a. VCS Standard (v4.3)</li> <li>b. VCS Program Guide (v4.2)</li> <li>c. VCS Validation and Verification Manual version (v3.2)</li> <li>d. Registration &amp; Issuance Process (v4.2)</li> <li>e. VCS Program Definitions version (v4.2)</li> <li>f. VCS MR template version 4.1</li> </ol>
/B02/	Applied baseline and monitoring methodology AM0023, version 04, "Leak detection and repair in gas production, processing, transmission, storage and distribution systems and in refinery facilities"
/B03/	Registered CDM PDD for CDM project "Reducing Gas Leakages within the Jalalabad Gas Distribution Network in Bangladesh" and the corresponding validation report including documents related to first and second CDM monitoring periods
/B04/	"Standard for sampling and surveys for CDM project activities and programme of activities" (version 09.0) Guidelines for sampling and surveys for CDM project activities and Programme of Activities (version 04)

/B05/	<p>Website and links:</p> <ol style="list-style-type: none"><li>1. <a href="http://cdm.unfccc.int">http://cdm.unfccc.int</a></li><li>2. <a href="http://www.v-c-s.org">http://www.v-c-s.org</a></li></ol>
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## APPENDIX 2: ABBREVIATIONS

CDM	Clean Development Mechanism
BE	Baseline Emission
CAR	Corrective Action Request
CC IPL	Carbon Check (India) Private Ltd.
CDM	Clean Development Mechanism
CH <sub>4</sub>	Methane
CL	Clarification Request
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2e</sub>	Carbon Dioxide Equivalent
DPR	Detailed project report
DVR	Draft Validation Report
EB	CDM Executive Board
EF	Emission Factor
ER	Emission Reduction
FAR	Forward Action Request
FVR	Final validation Report
GHG	Greenhouse gas(es)
GS	Gasurveyor
GWh	Giga Watt Hour
GWP	Global Warming Potential
HFS	Hi Flow Sampler
IPCC	Intergovernmental Panel on Climate Change
LDAR	Leak detection and repairs
LDMT	Leak Detection and Measurement Team
MP	Monitoring Period
MR	Monitoirng Report
MW	Mega Watt
MWh	Mega Watt Hour
NA	Not Applicable
OSV	On Site Visit
JGTDSL	Jalalabad Gas Transmission and Distribution System Limited (JGTDSL)
PD	Project Description
PP	Project Proponent
PSL	Prokaushali Sangsad Limited
QC/QA	Quality control/Quality assurance
TR	Technical Review
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Verified Carbon Standard
VCSA	Verified Carbon Standard Association
VCU	Verified Carbon Unit
VVB	Validation Verification Body
VVM	Validation and Verificatoin Manual
VVS	Validation and Verification Standard

# APPENDIX 3: CERTIFICATES OF COMPETENCE



## Carbon Check (India) Private Ltd.

### Mr. Sanjay Agarwalla

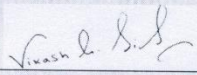
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

*For following functions:*

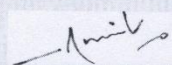
Validator	<input checked="" type="checkbox"/>	Team Leader	<input checked="" type="checkbox"/>	Technical reviewer	<input checked="" type="checkbox"/>
Verifier	<input checked="" type="checkbox"/>	Technical Expert	<input checked="" type="checkbox"/>	Local Assessor <sup>1</sup>	<input checked="" type="checkbox"/>

*In the following Technical Areas:*

TA 1.1	<input checked="" type="checkbox"/>	TA 3.1	<input checked="" type="checkbox"/>	TA 5.2	<input checked="" type="checkbox"/>	TA 9.2	<input checked="" type="checkbox"/>	TA13.2	<input type="checkbox"/>
TA 1.2	<input checked="" type="checkbox"/>	TA 4.1	<input checked="" type="checkbox"/>	TA 8.1	<input type="checkbox"/>	TA 10.1	<input type="checkbox"/>	TA14.1	<input type="checkbox"/>
TA 2.1	<input checked="" type="checkbox"/>	TA 5.1	<input checked="" type="checkbox"/>	TA 9.1	<input checked="" type="checkbox"/>	TA 13.1	<input checked="" type="checkbox"/>		



**Mr. Vikash Kumar Singh**  
Compliance Officer



**Mr. Amit Anand**  
CEO

**Date of Approval**  
24/12/2021

**Valid Till**  
23/12/2022

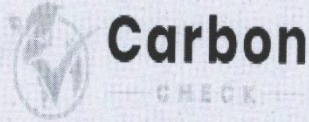
**Revision History of the Document**

01/03/2020 <sup>2</sup>	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision
24/12/2021	Annual Revision

<sup>1</sup> India

<sup>2</sup> Please refer to previous version of competency certificates for the revision history.

CARBON CHECK (INDIA) PRIVATE LIMITED  
CIN: U74930DL2012PTC232495  
Regd. Off: 2071/38, 2<sup>nd</sup> Floor, Naiwala, Karol Bagh, New Delhi - 110005  
Corporate off: Unit No. 1701, Logix City Centre Office Tower, Plot No. BW-58, Sector-32 Noida, Uttar Pradesh  
Tel: +91 120 4373114 | URL: [www.carboncheck.co.in](http://www.carboncheck.co.in) | e-mail: [info@carboncheck.co.in](mailto:info@carboncheck.co.in)



## Carbon Check (India) Private Ltd.

### Mr. Ramchandra Nesari

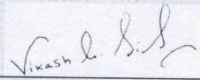
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

For following functions:

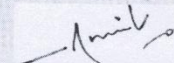
Validator  Team Leader  Technical reviewer   
 Verifier  Technical Expert  Local Assessor<sup>1</sup>

In the following Technical Areas:

TA 1.1  TA 4.1  TA 9.1  TA 13.1   
 TA 1.2  TA 5.1  TA 9.2  TA 13.2   
 TA 3.1  TA 5.2  TA 10.1  TA 14.1



Mr. Vikash Kumar Singh  
Compliance Officer



Mr. Amit Anand  
CEO

**Date of Approval**  
24/12/2021

**Valid Till**  
23/12/2022

#### Revision History of the Document

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01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision
24/12/2021	Annual Revision

<sup>1</sup> India

<sup>2</sup> Please refer to previous version of competency certificates for the revision history

CARBON CHECK (INDIA) PRIVATE LIMITED  
CIN: U74930DL2012PTC232495

Regd. Off: 2071/38, 2<sup>nd</sup> Floor, Naiwala, Karol Bagh, New Delhi - 110005

Corporate off: Unit No. 1701, Logix City Centre Office Tower, Plot No. BW-58, Sector-32 Noida, Uttar Pradesh  
Tel: +91 120 4373114 | URL: [www.carboncheck.co.in](http://www.carboncheck.co.in) | e-mail: [info@carboncheck.co.in](mailto:info@carboncheck.co.in)



## Carbon Check (India) Private Ltd.

### Vikas Vilasrao Bankar


has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):

*For following functions:*

Validator  Team Leader  Technical reviewer   
 Verifier  Technical Expert  Local Assessor<sup>1</sup>

*In the following Technical Areas:*

TA 1.1  TA 4.1  TA 9.1  TA 13.1   
 TA 1.2  TA 5.1  TA 9.2  TA 13.2   
 TA 3.1  TA 5.2  TA 10.1  TA 14.1



Mr. Vikash Kumar Singh  
Compliance Officer



Mr. Amit Anand  
CEO

**Date of Approval**  
24/12/2021

**Valid Till**  
23/12/2022

#### Revision History of the Document

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24/12/2020	Annual Revision
24/12/2021	Annual Revision

<sup>1</sup> India.

<sup>2</sup> Please refer to previous version of competency certificates for the revision history.

**CARBON CHECK (INDIA) PRIVATE LIMITED**

CIN: U74930DL2012PTC232495

Regd. Off: 2071/38, 2<sup>nd</sup> Floor, Naiwala, Karol Bagh, New Delhi - 110005

Corporate off: Unit No. 1701, Logix City Centre Office Tower, Plot No. BW-58, Sector-32 Noida, Uttar Pradesh

Tel: +91 120 4373114 | URL: [www.carboncheck.co.in](http://www.carboncheck.co.in) | e-mail: [info@carboncheck.co.in](mailto:info@carboncheck.co.in)



## Carbon Check (India) Private Ltd.

### Mr. SP Reddy

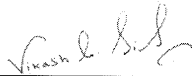
has been qualified as per CCIPL's internal qualification procedures, in accordance with requirements of Accreditation Standard (version 07.0):


*For following functions:*

Validator  Team Leader  Technical reviewer   
 Verifier  Technical Expert  Local Assessor

*In the following Technical Areas:*

TA 1.1  TA 4.1  TA 9.1  TA 13.1   
 TA 1.2  TA 5.1  TA 9.2  TA 13.2   
 TA 3.1  TA 5.2  TA 10.1  TA 14.1

  
 Mr. Vikash Kumar Singh  
 Compliance Officer

  
 Mr. Amit Anand  
 CEO

**Date of Approval**  
 24/12/2021

**Valid Till**  
 23/12/2022

#### Revision History of the Document

01/03/2020 <sup>1</sup>	Interim Revision for office address change
01/09/2020	Interim Revision for CCIPL logo change
24/12/2020	Annual Revision
24/12/2021	Annual Revision

<sup>1</sup> Please refer to previous version of competency certificates for the revision history

## APPENDIX 4: FINDINGS LOG

Table 1. CLs from this Verification

Finding	CL 01
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	In section 1.1 of the MR, under the milestone of the project activity and timeline table, the VCS monitoring period is described as the “3 <sup>rd</sup> monitoring period under VCS” and two different durations (20/01/2019-30/07/2020 and 01/01/2021-31/12/2021) are clubbed together. Whereas, as per the title page of this document, this monitoring period covers only the 20/01/2019-30/07/2020 duration. Also to note, this is actually the 1 <sup>st</sup> periodic verification under VCS. PP is requested to provide more clarity on the numbering of the monitoring periods and the duration they cover.
<b>Corrective Action or clarification #1</b> <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	<i>The timeline and project period numbering has been updated to make it clearer and more consistent.</i>
<b>VVB Assessment #1</b> <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	PP has updated the timeline and project period numbering in the section 1.1 of the revised MR to make it more appropriate and clearer.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding	CL 02
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	PP is requested to provide evidence for each of the claimed SDG parameters' values.
<b>Corrective Action or clarification #1</b> <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	<i>The values have been updated to align with the excel sheet. Additional evidence has been provided to document the employment figures.</i>

Finding	CL 02
<b>VVB Assessment #1</b> <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	PP has provided evidence for each of the claimed SDG parameters. The CL is closed.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding	CL 03
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	In section 1.1 of the MR, under the milestone of the project activity and timeline table, CDM monitoring period dates are incorrect. PP is requested to rectify the same
<b>Corrective Action or clarification #1</b> <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	<i>The corrections to the monitoring dates under CDM have been made.</i>
<b>VVB Assessment #1</b> <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	PP has corrected the CDM monitoring period dates in section 1.1 of the revised MR.
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding	CL 04
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	The stated value of parameters $UR_j$ and $UR_z$ in section 4.2 of the MR does not match with the ER calculation spreadsheet
<b>Corrective Action or clarification #1</b> <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	<i>The values have been updated as per the most recent excel sheet.</i>

Finding	CL 04
<p><b>VVB Assessment #1</b></p> <p><i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i></p>	<p>PP has corrected the value in the revised MR to be aligned with ER spreadsheet.</p> <p>Moreover, in the revised MR, PP has removed UR<sub>z</sub>, since it is not used as there are no project emissions which is deemed to be acceptable.</p>
<p><b>Conclusion</b></p> <p><i>Tick the appropriate checkbox</i></p>	<p><input type="checkbox"/> To be checked during the next periodic verification</p> <p><input type="checkbox"/> Outstanding finding (not closed)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	CL 05
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	The sectoral scope mentioned in section 1.2 of the MR is inconsistent with <a href="https://verra.org/project/vcs-program/projects-and-jnr-programs/vcs-sectoral-scopes/">https://verra.org/project/vcs-program/projects-and-jnr-programs/vcs-sectoral-scopes/</a> and the UN project webpage.
<p><b>Corrective Action or clarification #1</b></p> <p><i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i></p>	<p><i>Updated to same language used on UN Project webpage</i></p>
<p><b>VVB Assessment #1</b></p> <p><i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i></p>	PP has updated section 1.2 of the revised MR to be consistent Verra and CDM website.
<p><b>Conclusion</b></p> <p><i>Tick the appropriate checkbox</i></p>	<p><input type="checkbox"/> To be checked during the next periodic verification</p> <p><input type="checkbox"/> Outstanding finding (not closed)</p> <p><input checked="" type="checkbox"/> The finding is closed</p>

Finding	CL 06
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	The number of staff employed is inconsistent with the same mentioned in other sections of the MR.
<p><b>Corrective Action or clarification #1</b></p> <p><i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i></p>	<p><i>Updated</i></p>
<p><b>VVB Assessment #1</b></p> <p><i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i></p>	PP has made the number staff employed consistent throughout the document and in line with support document.

Finding	CL 06
<b>Conclusion</b> Tick the appropriate checkbox	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding	CL 07
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	For section 4.2 of the MR, please clarify why parameters URj and URz are not calculated separately as those should be used for calculations of baseline emissions and project emissions respectively.
<b>Corrective Action or clarification #1</b> (PP shall write a detailed and clear corrective action or further information for clarification as per finding)	URz is not used as there are no project emissions so this has been removed.
<b>VVB Assessment #1</b>  The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.	PP has removed URz, since it is not used as there are no project emissions.
<b>Conclusion</b> Tick the appropriate checkbox	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Finding	CL 08
<b>Classification</b>	<input type="checkbox"/> CAR <input checked="" type="checkbox"/> CL <input type="checkbox"/> FAR

<p><b>Description of finding (VVB)</b></p>	<p>Following issues were identified related to the ER spreadsheet:</p> <ol style="list-style-type: none"> <li>1. Header row of the monitored parameters should be mentioned in line with Data/Parameter symbol mentioned for easier identification.</li> <li>2. ER sheet “Title Page” and “ER Total” mentions VCS01. Please clarify what is VCS01.</li> <li>3. The file name should not be too long and it should indicate the distribution site name with the VCS monitoring period and version and it is desirable to follow a same naming practice for all MPs. The worksheet names are: Title Page, ER Totals, Total, Uncertainty, Outage, SDG. It is desirable to follow a same naming practice for all MPs.</li> <li>4. Out of total 10905 leakages identified and repaired during the baseline, 257 leakages were not monitored during the monitoring period. Details of these not monitored due to stoppages or cut offs could not be linked. However, as shown in “Outage” worksheet, all the dates of outages are after the MP1.</li> <li>5. If all the outages are after the completion of MP1, why the stoppages are shown in “Outages” of MP-1. Please confirm that there were no outages during the monitoring period.</li> <li>6. “Outage” worksheet should also show the data of resumption date of the stoppage of the supply and also reason for the stoppage viz. Outage or Cut-off.</li> <li>7. All the dates of monitoring leakages are from October 2020 to November 2021, which are beyond the monitoring period MP1.</li> <li>8. There was only one measurement for each leak checking. If that is so, why the heading for the leak rate should be M2 (Column N and O).</li> <li>9. The difference between the monitored leak rate and baseline leak rate is -ve in 14 cases. However, in CER calculations it is not considered and shown as ‘blank’.</li> <li>10. “SDG” worksheet should show the data of leakages observed by LDAR, leakage reduction achieved after repair of the same and total CER achieved during</li> </ol>
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Finding	CL 08
	and up to the monitoring period M P1. The data of MP2 should not be shown MP1.
<p><b>Corrective Action or clarification #1</b>                      (PP shall write a detailed and clear corrective action or further information for clarification as per finding)</p>	<ol style="list-style-type: none"> <li>1. Information added.</li> <li>2. The reference has been removed.</li> <li>3. Name shortened and edits made for consistency of names of worksheets.</li> <li>4. Not every leak can be monitored every period. Construction, natural hazards, etc. prevent monitoring. No ERs are claimed for non-monitored leak repairs. The reason for stoppages has been added.</li> <li>5. List updated.</li> <li>6. The reason for stoppage has been included and the dates of all the places that have had a resumption of gas have been included.</li> <li>7. The methodology is based on the premise leaks either stay the same or get worse. Therefore if a leak repair is still zero over a period of time, then it was still repaired during the two measurements.</li> <li>8. M-1 has been included.</li> <li>9. The project repair that gets a leak to zero is not responsible for the leak returning because a truck hits the riser (a real example). In the few cases this occurs, something that would have happened as well in the baseline case has caused it. It therefore makes no logistical sense for the project to be penalized for the leak returning beyond its initial leak rate as the methodology is based on the assumption that leaks do not get better by themselves just worse. This is what the methodology gives the PP the option to count a returned leak as the same leak rate as the initial leak.</li> <li>10. The values provided in SDG worksheet covering the total duration of project lifetime as of the date of submission is for clarity reason.</li> </ol>

Finding	CL 08
<p><b>VVB Assessment #1</b></p> <p><i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i></p>	<ol style="list-style-type: none"> <li>1. PP has added the information in header row.</li> <li>2. PP has updated the reference.</li> <li>3. PP has taken appropriate measures to make the file name and worksheet names consistent.</li> <li>4. The explanation provided by the PP is deemed logical and acceptable.</li> <li>5. PP has updated the list.</li> <li>6. PP has included the the information.</li> <li>7. As explained by the PP, if a leak repair is still zero over a period of time, then it is considered as repaired during the two measurements.</li> <li>8. PP has included M-1.</li> <li>9. The explanation provided by the PP is deemed to be logical acceptable.</li> <li>10. PP has explained that the values covering the total duration of project lifetime as of the date of submission in the SDG worksheet they have provided is for more clarity.</li> </ol>
<p><b>Conclusion</b></p> <p><i>Tick the appropriate checkbox</i></p>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed

Table 2. CARs from this Verification

Finding	CAR 01
<b>Classification</b>	<input checked="" type="checkbox"/> CAR <input type="checkbox"/> CL <input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	<ol style="list-style-type: none"> <li>1. In section 1.3 Project Proponent's address is missing. PP is requested to provide complete information as per the VSC monitoring report template filling guidelines.</li> <li>2. PP is requested to clarify why the VCS MR template completion guideline is not followed in terms of font type, size, and color.</li> </ol>
<p><b>Corrective Action or clarification #1</b></p> <p><i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i></p>	<ol style="list-style-type: none"> <li>1. <i>The address has been added.</i></li> <li>2. <i>Rectified.</i></li> </ol>
<p><b>VVB Assessment #1</b></p> <p><i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i></p>	<ol style="list-style-type: none"> <li>1. PP has provided the missing information in the revised MR.</li> <li>2. PP has rectified the inconsistencies and used 10.5 black font throughout the revised MR.</li> </ol>
<b>Conclusion</b>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed)

Finding	CAR 01
Tick the appropriate checkbox	<input checked="" type="checkbox"/> The finding is closed

Finding	CAR 02		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	In section 1.6 of the MR, VCS crediting period is incorrectly mentioned. Please clarify.		
<b>Corrective Action or clarification #1</b> <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	Corrected.		
<b>VVB Assessment #1</b> <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	PP has updated section 1.6 of the revised MR to make it consistent with VCS PD.		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed		

Finding	CAR 03		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	Please clarify the appropriateness of the GWP of Methane considered in line with clause 3.14.4 of the VCS Standard.		
<b>Corrective Action or clarification #1</b> <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	3.14.4 requires use of the 5th Assessment Report which defines a value for methane of 28 as used in the calculations for projects that are not validated by VCS before 1 January 2021.		
<b>VVB Assessment #1</b> <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	VCS project standard, in section 3.14.4, states, "For GHG emission reductions occurring on or before 31 December 2020, all ex-ante estimates and ex-post calculations may be converted to CO2e using either the GWP values from the IPCC Fourth Assessment Report (AR4) or those from AR5". Hence, GWP value for methane of 28 used in the calculations is deemed appropriate.		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed		

Finding	CAR 04		
<b>Classification</b>	<input checked="" type="checkbox"/> CAR	<input type="checkbox"/> CL	<input type="checkbox"/> FAR
<b>Description of finding (VVB)</b>	The calculation of BCAP is erroneous and leak repairs beyond first crediting year (20-Jan-2019 to 19-Jan-2020). Please check and clarify.		
<b>Corrective Action or clarification #1</b> <i>(PP shall write a detailed and clear corrective action or further information for clarification as per finding)</i>	<i>BCAP calculation has been upded and leaks from 1st crediting year only (20-Jan-2019 to 19-Jan-2020) have been considered to arrive at BCAP.</i>		
<b>VVB Assessment #1</b> <i>The assessment shall encompass all open issues in the finding. In case of non-closure, additional corrective action and VVB assessments (#2, #3, etc.) shall be added.</i>	PP has rectified the BCAP calculation appropriately to be based on the repairs taken place withing the first crediting period only.		
<b>Conclusion</b> <i>Tick the appropriate checkbox</i>	<input type="checkbox"/> To be checked during the next periodic verification <input type="checkbox"/> Outstanding finding (not closed) <input checked="" type="checkbox"/> The finding is closed		