VERIFICATION REPORT

Verification of Organization Level GHG Inventory against ISO 14064-3:2006

ASHRAFF MEMORIAL HOSPITAL, KALMUNAI

INVENTORY YEAR 2018

Prepared by: Sri Lanka Climate Fund
Ministry of Mahaweli Development and Environment
"Sampathpaya", No 82, Rajamalwatta Road,
Battaramulla.

Glossary

GHG	Greenhouse Gas
COI	Conflict of Interest
SLCF	Sri Lanka Climate Fund
AMHK	Ashraff Memorial Hospital, Kalmunai
CO_2	Carbon Dioxide
N_2O	Nitrous Oxide
CH_4	Methane
tCO_2e	Tons of carbon dioxide equivalent
IPCC	Intergovernmental Panel on Climate Change
DEFRA	Department for Environment, Food and Rural Affairs

Table of Contents

Introduction

Ashraff Memorial Hospital, Kalmunai has prepared a voluntary GHG inventory for its corporate operation activity through 2018 calendar year.

Sri Lanka Climate Fund engaged to provide a third-party verification of the GHG inventory, including Scope 1, Scope 2, and selected Scope 3 emissions, ("GHG Assertion") for voluntary GHG reporting purposes for the 2018 calendar year. The quantification of organization's GHG emissions inventory is guided by the ISO 14064-1:2006: Greenhouse Gas Specification with guidance at the organizational level for quantification and reporting of greenhouse gas emissions and removals, published by the International Organization for Standardization using control approach to establish the inventory boundary.

The GHG inventory (2018) includes the following emissions sources.

Scope 1: Stationary combustion in diesel generators, Fuel combustion from Hospital Owned vehicles, Emission from off-road transportation (Tractor), Emission from LPG consumption, Diesel combustion from Incinerator and Emission from incineration.

Scope 2: Indirect emissions associated with grid purchased electricity.

Scope 3: Indirect emissions associated with Staff transportation not paid by the hospital, Fuel combustion from drug transportation, Waste disposal, Municipal water consumption, and Transmission & Distribution Loss of purchased electricity.

This is the first time in which Sri Lanka Climate Fund has been engaged by Ashraff Memorial Hospital, Kalmunai for verification services pertaining to its annual corporate inventory.

This document describes the terms and scope of this verification. It serves to communicate the findings of the verification.

1. Verification Body Details

Name:	Sri Lanka Climate Fund
Address:	"Sampathpaya", No.82, Rajamalwaththa Road, Battaramulla
Contact Information:	Phone: 011 205 3065 Fax: 011 286 7424
Accreditation Agency:	Sri Lanka Accreditation Board

2. Organization Information

Name:	Ashraff Memorial Hospital, Kalmunai
Address:	Main Street , Kalmunai
Main Contact:	Mr. Dr.MCM.Mahir MO/QMU Email: mahirhazeef@gmail.com Tel.: 0759207155

3. Verification Summary

Verification Objectives:		The objective of the verification was to assess whether the GHG Assertions for Ashraff Memorial Hospital, Kalmunai (AMHK), 2018 operations are accurately prepared in accordance with appropriate criteria.
Reporting Period	:	The verification was conducted for the period of January 1, 2018 to December 31, 2018.
Verification Standard	:	ISO 14064-3: 2006 Specification with guidance for the validation and verification of greenhouse gas assertions.
Verification Criteria	:	The verification has been performed against the ISO 14064-1:2006: Greenhouse Gases Specification with guidance at the organization level for quantification, and reporting of greenhouse gas emissions and removals.
Verification Scope	:	Following elements were included in the scope of the verification *of GHG inventory prepared by AMHK for the period of calendar* year 2018. • Organizational Boundaries • Physical infrastructure, activities, technologies of the organization • GHG sources (Scope 1, 2, & 3) • Types of GHGs
Level of Assurance	:	Reasonable

Materiality : ISO 14064-3:2006 standard has set a quantitative materiality of 5% of an organization's or GHG project's GHG emissions.

For the purpose of this engagement, quantitative materiality was applied to the total emission calculation for AMHK.

Verification Team :

Team Leader:	Mr. Chamara Ariyathilaka
Technical Expert:	Mr. Chamara Ariyathilaka
Verifiers:	Ms. Sumudu Harshanee Mr. Gayan Madusanka
Internal Peer Reviewer:	Ms. Harshani Abeyrathna

4. Verification Execution

The scope of the verification was defined during the verification planning stage. The specific verification procedures that were planned and executed through the verification process are as below.

	Pre-Engagement		Approach		Execution of Verification		Completion
1.	Kick-off Meeting	5.	Initial Information and Data Request	9.	Site Visit	14.	Evaluate Evidence
2.	Initiate Conflict of Interest Procedure	6.	Verification Risk Assessment	10.	Conduct Verification Procedures	15.	Draft Verification Report & Statement
3.	Selection of Verification Team	7.	Preparing Verification and Sampling Plans	11.	Issue Clarification & Data Request	16.	Internal Peer Review
4.	Contract Execution	8.	Conduct initial desktop review	12.	Revise & Finalize Verification and Sampling Plan	17.	Issue Verification Report & Statement
				13.	Address and Evaluate Outstanding Issues		

4.1. Conflict of Interest Determination

Verifiers first self-assess the potential for a conflict of interest (COI) between the verification team and the reporter. An Impartiality Risk Analysis was performed in order to ensure whether or not a COI exists between the verifier and the participants. Accordingly SLCF concurred with the determination that there was no pre-existing relationship between SLCF and AMHK, and that therefore the potential for COI was low.

4.2. Verification Risk Assessment

The verification team assesses the overall verification risk and determines whether the risks are material and have been appropriately disclosed. The verification team will assess risk throughout the verification and adjust the sampling plan as required to meet the assurance requirements of the verification and maintain an acceptable level of risk.

Overall risk assessment was conducted by SLCF verification team based on an assessment of inherent risk, control risk, and detection risk. In this case, the preliminary overall risk has been assessed as low, based on SLCF preliminary assessment. The rationale for the assessment of overall risk as low is provided in the following sections.

Inherent Risk

Inherent risk is the risk of error that occurs as a result of the lack of capacity by staff; the size/complexity of the organization; the industrial sector; and/or, the technologies or processes being applied in the organization. We regard this risk as **low** due to:

- There is no any production processes or very complex technologies being applied, only the service based operations are going on (low risk).
- Most GHG calculations are straightforward, based on activity data, and as applicable, emission factors (low risk).
- Most of the activity data used in the assertions is directly metered or invoiced (low risk).

Control Risk

Control risk is the risk that the proponent's control system will not detect and rectify a discrepancy. When assessing the AMHK information systems and controls for sources of potential errors, omissions and misrepresentations, the following will be taken into consideration:

- Selection and management of the environmental metric data and information;
- Processes for collecting, processing, consolidating and reporting environmental metric data and information;
- Systems and processes that ensure the accuracy of the environmental metric data and information;
- Design and maintenance of the environmental metric information system;
- Results of previous assessments, if available and appropriate.

We currently regard this risk as **low** due to:

- AMHK has not undergone previous verifications (medium risk);
- AMHK uses a data management system to support the collection and maintenance of environmental metric data and information (low risk).
- These information is properly maintained by both manually and systematically (low risk).

Detection Risk

Detection risk is the risk that SLCF will not identify a material discrepancy. SLCF regard this risk as **low** due to:

- SLCF quality management procedures.

  SLCF is committed to providing exceptional service in accordance with our ISO 14065 accreditations. We take a systematic approach to quality management to comply with requirements and to achieve continual improvement. The cornerstone of our quality management system is an entrenched process of Senior and Independent Peer Review which sees that our deliverables have been vetted by experienced and knowledgeable people in our firm.

- Level of assurance.

  This is a reasonable level of assurance engagement. SLCF reviewed most of the GHG related information and SLCF will design the sampling plan to target potentially material items in the Assertions to keep detection risk low.

4.3. Verification Plan Development

The Verification Plan is prepared based on the verification risk assessment and it provides an overall roadmap for the verification process. It was revised based on information discovered during the verification process. The Verification Plan lists specific activities that must be conducted during the verification and verification plan also identifies an expected timeline for the completion of each activity.

4.4. Verification Schedule

The verification was completed according to the schedule established between the Responsible Party and the Verifier. The verification reached important milestones on the following dates:

Description	Scheduled date
Preliminary Data Request	11/03/2019
Site Visit	03/06/2019
Document Review	04/06/2019
Pre Assessment	07/06/2019
Initial Assessment	07/06/2019
GHG Assertion Clarification Request	10/06/2019
Draft Verification Statement and Report	11/06/2019
Internal Peer Review	12/06/2019
Final Verification Statement and Report	13/06/2019

4.5. Site Visit

A site visit was conducted on June 03, 2019 in Ashraff Memorial Hospital, Kalmunai. The site visit was devoted to better understanding the operations, data gathering processes, GHG information and data management systems. This included a review of all GHG emissions sources at the facility.

4.6. Data Management and Control System Review

A critical element of the verification process was for the Verification Team to gain a thorough understanding of the data management systems and controls employed by AMHK. This understanding necessitated a review of:

- The parties involved and their respective responsibilities;
- The facility data collection and automated data measurement and management systems;
- Post-collection data manipulation;
- Quality assurance procedures employed to detect erroneous or missing data;
- Processes for updating historical data in the event that errors are detected;
- Document control and security systems, including access, and tracking of edits; and
- Changes to the data management system over time or opportunities for improvement.

4.7. Pre and Initial Assessment

The verification work was performed as desk review, based on calculation and the supporting technical documentation. The main elements of the examination were:

- Review of the inventory report for compliance with the Regulation, ISO 14064-1 and consistency with the verification plan;
- Tracing the figures disclosed in the Inventory Report back to the associated spreadsheets and cross-checking sample data back to the underlying sources;
- Assessing whether there have been any material changes in the sinks, sources and reservoirs associated with the organizational & operational boundaries.

Verification Team conducted the pre-assessment on June 07, 2019 after taking the corrective actions for the audit findings of Document Review by them. The GHG inventory prepared by AMHK and the evidences of the data that they have used to calculate the emission was verified. The Initial Assessment was conducted on June 07, 2019 as planned and agreed with client. Verifiers raised audit findings for the Inventory Report as Nonconformance (Major, Minor or Observation).

All Scope 1, 2 and 3 emission factors used in GHG inventory report were checked for correctness; utilizing the following sources:

- The Greenhouse Gas Protocol Emission Factors, Fifth Assessment
- IPCC Guidelines for National Greenhouse Gas Inventories 2006
- Sri Lanka Energy Balance 2016, Sri Lanka Sustainable Energy Authority

5. Verification Findings

5.1. Types of GHGs

Three out of seven greenhouse gases under Kyoto Protocol, Carbon dioxide (CO_2), Methane (CH_4) and Nitrous oxide (N_2O) are generated from hospital operations.

5.2. GHG Sources

Emission Source	GHGs included	Source of activity data
Direct GHG emissions		
Onsite diesel generators	CO_2, CH_4, N_2O	Monthly fuel records
Hospital Owned vehicles (Diesel Consumption)	CO_2, CH_4, N_2O	Monthly fuel records
Off road transportation (Tractor)	CO_2, CH_4, N_2O	Monthly fuel records
LPG Consumption	CO_2, CH_4, N_2O	Credit sale bills
Incinerator Diesel Consumption	CO_2, CH_4, N_2O	Monthly fuel records
Emission from incineration	CO_2	Waste records
Energy indirect GHG emissions		
Grid electricity supply	CO_2, CH_4, N_2O	Monthly electricity bills
Other indirect GHG emissions		
Drug transportation	CO_2, CH_4, N_2O	Monthly fuel records
Employee commuting, not paid by the company (Diesel+Petrol Consumption)	CO_2, CH_4, N_2O	Random Interviews and survey records
Waste disposal	CO_2, CH_4, N_2O	Waste records
Municipal water	CO_2, CH_4, N_2O	Monthly water bills
Transmission and distribution loss of electricity	CO_2, CH_4, N_2O	Monthly electricity bills

5.3. Exclusions

Emission from water treatment plant was excluded due to unavailability of relevant data.

5.4. Assumptions and Limitations

All assumptions made during the verification process have been clearly explained in the relevant sections to which they pertain. Due to difficulty to obtain exact figures when calculating emissions from Employee commuting has some range of uncertainty. Reasonable assumptions and data collection has performed to obtain rough estimation.

All the emission factors were adopted from IPCC and DEFRA has a range of uncertainty due to not availability of local specific emission factors.

Amount of diesel reported in onsite generator in the December may not be fully combusted in respective month. In that case assumption was made and there is little uncertainty.

Waste incineration was excluded period of May to November due to Incinerator was out of order. Reasonable average value of diesel was included. Therefore little uncertainty was associated with total fuel consumption.

5.5. Reservoirs/Sink

There are no GHG sinks included in the organization.

5.6. GHG Calculation Verification Summary

Scope	Emission source	Activity Data	Unit	Total emissions (tCO_2e)
1	Onsite diesel generators	3800	Litres/year	10.20
1	Hospital Owned vehicles (Diesel Consumption)	40109.18	Litres/year	109.01
1	off road transportation (Tractor)	272	Litres/year	0.80
1	LPG Consumption	2700	kilograms/year	8.07
1	Incinerator Diesel Consumption	1400	Litres/year	3.76
1	Emission from incineration	594	kilograms/year	0.18
2	Grid connected electricity	1271633	kWh/year	722.80
3	Drug transportation	14455	Litres/year	38.97
3	Employee commuting, not paid by the company (Diesel+Petrol Consumption)	306294.65	Litres/year	816.06
3	Waste disposal	11742.5	kilograms/year	1152.78
3	Municipal water	18880	Cubic Litres /year	11.34
3	Transmission and distribution loss of electricity	135507.64	kWh/year	76.97
Total GHG emission for the year 2018 (tCO_2e)				**2,950.93**

Direct GHG Emissions : 132 tonnes of CO_2 equivalent
Indirect GHG Emissions : 723 tonnes of CO_2 equivalent
Other indirect GHG Emissions : 2,096 tonnes of CO_2 equivalent

Total GHG Emission, 2018 : 2,951 tonnes of CO_2 equivalent

5.7. GHG Emissions Reduction Methods

In order to reduce the GHG emissions associated with the operations, AMHK has adopted few sustainability initiatives. Adoption of Carbon footprint in a Hospital can definitely enhance its green image across the society and reduction in carbon emissions is synonymous with reduced its energy costs. Hospital recently have saved significant costs and achieved efficiency targets through implementing following activities.

1 Using of double burner incinerator for burning hazardous waste
2 Complete prevention of open burning
3 Planting trees & plants
4 Space planting
5 Promotion of indoor plants
6 Use of Echo friendly & energy saving inverter type AC & Refrigerator
7 CFL & florescent lights are Replaced with Energy serving LED lights
8 Architectural modification of building to utilize sun light & air
9 Sensor water tap (sensation tap)
10 Replacing florescent lights in the Phototherapy unit with LED bulbs
11 Strict rule on the use of AC at 26^0 C in all places within the hospital
12 Declared as polythene free zone in 2016
13 Replacing polythene cover with paper bags for dispensing medicine
14 Providing Lunch & refreshment with bio degradable packing
15 Prohibition of plastic water bottle within hospital premises
16 Use glasses & filtered water for drinking
17 Use of metamizer for selected hazardous wastes
18 Dental RVG x-ray replacing routine x-ray film
19 Replacing AMALGAM with COMPOSIT for filling teeth at dental unit

6. Corrective Actions Requests

The following corrective actions were undertaken by AMHK to improve the accuracy of the GHG inventory report:

6.1. Activity data

- Hospital quarters were excluded from the boundary and it was redefined. Electricity and water consumption units were updated accordantly to hospital operational boundary
- Recorded incorrect LPG consumption units were updated as 2700kg
- Reported overestimated fuel quantity in diesel combustion of Incinerator was changed by taking reasonable average value
- Waste incineration data and recycling data were separated and corrected values were taken to calculations

6.2 Establishment of organization boundary

- Organization boundary was redefined including Blood Bank and Ashraff Memorial Hospital
- Since it is not mentioned the person who responsible for the assessment it was mentioned under clause 3

6.3 Identification of GHG sources

- Since it is not identified the correct scope for the GHG emission from ministry owned vehicles, it was recorded and calculated under the scope 1 considering beyond the control of hospital
- Emission from fuel combustions of off road transportation was not identified as a separate emission source category and it was reported and calculated under scope 1
- CO_2 Emission from incineration was not identified as GHG source and it was included to the inventory

6.4 Emission factors

- Recorded incorrect emission factors used for calculation of emission from LPG consumption was corrected with CO_2 63100 kg/TJ , $CH_4$1 kg/TJ and N_2O 0.1 kg/TJ

6.5 Report content

- Description of the impact of uncertainties on the accuracy of the GHG emissions and assumptions were made was included under clause 10
- Statement describing whether the GHG inventory, report has been verified including the type of verification and level of assurance achieved was included under clause 1
- Emissions associated from waste water treatment was not reported under explanation of exclusion part and updated as appropriate
- GHG emission or removal factors with references were documented separately in table under clause 8

7. GHG Assertion

Compliance of the calculation tool (reasonable to the GHG emissions at the organization level) with the principles and requirements of ISO 14064-1:2006.

Sri Lanka Climate Fund has determined that the material assessed during the verification of the criteria is sufficient to support the GHG assertion. The verification procedures developed and executed during the course of this verification will present evidence such that each of these principles is satisfied.

- **Relevance**: Appropriate data sources are used to quantify GHG sources.
- **Completeness**: All sources within AMHK GHG inventory boundary are included within an identified source category.

- **Consistency**: Uniform calculations are employed between the base year and current reporting period. Emissions calculations for each source are calculated uniformly. If more accurate procedures and methodologies become available, documentation should be provided to justify the changes and show that all other principles are upheld.

- **Accuracy**: Calculation method offering the highest accuracy is always preferred. When available a specific emission factor can replace a default emission factor (IPCC & DEFRA).

- **Transparency**: Information is presented in an open, clear, factual, neutral, and coherent matter that facilitates independent review. All assumptions are stated clearly and explicitly and all calculation methodologies and background material are clearly referenced.

- Requirements for quantifying the organization's GHG emissions and removals: The calculation tool includes an appropriate approach for the quantification.

- The identification of GHG sources and sinks (including scope 1, 2, 3 definitions).

- The selection of quantification methodology.

- The selection or development of GHG emission or removal factors (all emission factors are appropriately documented and up to date at the time of verification).

- The calculation of GHG emissions and removals (the calculation formulas within the worksheet have been successfully checked).

- The selection and collection of the relevant activity data that needs to be filled in the calculation tool is left up to the user when implementing the system to a particular company.

8. Internal Peer Review Process

Prior to releasing the Verification Report and Verification Statement, an internal review process is conducted by the Internal Peer Reviewer. This process ensures that:

- All steps identified as being required to complete the verification were completed;

- Any identified material or immaterial discrepancies identified have been either: corrected by the Responsible Party and reflected in the GHG Assertion; or documented in the Verification Report, if discrepancies persist at the conclusion of the verification.

- All required documentation detailing the verification process has been prepared, delivered, and retained.

9. Conclusion

It is understood that the use of the GHG tool by Ashraff Memorial Hospital, Kalmunai is compliance with ISO 14064-1:2006. It will depend on the appropriate implementation of the tool and of the principles and criteria of ISO 14064-1:2006 using the tool (organizational boundaries, monitoring systems, data management, collecting, processing, consolidating, controlling and reporting the GHG data).

10. Verification Statement

Ashraff Memorial Hospital, Kalmunai is responsible for the preparation and presentation of the information within the Inventory Report. The responsibility of SLCF is to express a conclusion as to whether the greenhouse gas emission calculation is presented fairly in accordance with the verification criteria, which comprise:

ISO 14064 – Part 1 Greenhouse Gases Specification with guidance at the organization level for quantification, and reporting of greenhouse gas emissions and removals

SLCF completed assessment in accordance with ISO 14064-Part 3 Specification with Guidance for the validation and verification of greenhouse gas assertions.

Based on the verification results, SLCF grants the reasonable level of assurance for the GHG report (Final version) presented by Ashraff Memorial Hospital, Kalmunai in accordance with the relevant criteria, in all material respects (threshold error is below 5%.).

.....

G A M C Ariyathilaka
Chief Executive Officer
Sri Lanka Climate Fund

Appendix 1: Conflict of Interest

Sri Lanka Climate Fund monitored threats to independence throughout the duration of the assessment. The following declaration affirms that the verification team members,

1. Do not offered any consultancy, guidance, supervision or other services to the client being assessed, in anyway,
2. Maintain strict confidentiality of the information acquired in course of discharge of my responsibility and ensure that such information be accessible to authorized persons,
3. Shall neither copy any documentation nor divulge any information collected to any third party without written prior consent from the client,
4. Act objectively and free from any undue commercial, financial or other pressures that would compromise impartiality of evaluation process,
5. Have no any relationship with personnel or interest of personnel those who provided GHG consultancy services to the client,
6. Are not in a position of assessing their own work.

Date: 13/06/2019

.....

G M A C Ariyathilaka,
Team Leader,
Sri Lanka Climate Fund

Appendix 2: Internal Peer Review Report

Responsible Party : Ashraff Memorial Hospital, Kalmunai

Date of Peer Review Completed : 12/06/2019

Time : 9.30 AM -3.00 PM

Verification Activities Reviewed

Verification Process	Comments
Data Sampling	In lieu of data sampling, data sources and management practices were reviewed. The original data set in its entirety was then used to perform a recalculation.
Verification Activities	Working notes provide sufficient detail to demonstrate that all verification activities were completed through the course of the verification.
Issues raised during the verification	All questions and issues raised during the verification were sufficiently addressed by the Responsible Party.
Conflict of Interest	An assessment for threats to independence was conducted before the verification began and after the verification was completed. No real or perceived conflicts of interest were identified.

Verification Conclusion

Sufficient and Appropriate Evidence	The evidence collected through the verification activities reduces the overall verification risk and supports the verification conclusion.
Verification Report	All documentation required in the Verification Report is included and complete.
Greenhouse Gas Verification Statement ISO 14064-3:2006	All required information is included in the statement.

Based on the documentation reviewed during the peer review process, I believe the verification of the GHG inventory for 2018 prepared by Ashraff Memorial Hospital, Kalmunai was completed in accordance with the ISO 14064-3 standard.

Reviewed by,

Harshani

.....

Harshani Abeyrathna.