Verification Report for Carbon Offset Units (CoUs) for Project (UCR ID Number: 091)

Title: “11.925 MW bundle of Small Scale Hydro Power project by Government of Arunachal Pradesh”

Project Owner details:

Government of Arunachal Pradesh,

Address: Vidyut Bhawan, Itanagar, Arunachal Pradesh 791111, India.

Submitted by:

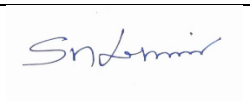
Naturelink Solutions Pvt Ltd

Approved Verifier, UCR

Email: info@thenaturelink.in

COVER PAGE Project Verification Report Form (VR)	
BASIC INFORMATION	
Name of approved UCR Project Verifier / Reference No.	Naturelink Solutions Pvt. Ltd.
Type of Accreditation	☐ CDM Accreditation ☐ ISO 14065 Accreditation ☒ UCR Approved Verifier
Approved UCR Scopes and GHG Sectoral scopes for Project Verification	Sectoral Scope: 01 Energy Industries
Validity of UCR approval of Verifier	November 2023 onwards
Completion date of this VR	12/01/2024
Title of the project activity	11.925 MW bundle of Small Scale Hydro Power project by Government of Arunachal Pradesh.
Project reference no. (as provided by UCR Program)	091
Name of Entity requesting verification service (can be Project Owners themselves or any Entity having authorization of Project Owners, example aggregator.)	Government of Arunachal Pradesh
Contact details of the representative of the Entity, requesting verification service (Focal Point assigned for all communications)	Creduce Technologies Private Limited- Address: 2-O-13,14 Housing Board Colony, Banswara, Rajasthan - 327001, India.
Country where project is located	India
Applied methodologies (Approved methodologies by UCR Standard used)	AMS-I.D.: "Grid connected renewable electricity generation", version 18
Project Verification Criteria: Mandatory requirements to be assessed	☒ UCR Standard ☒ Applicable Approved Methodology ☐ Applicable Legal requirements /rules of host country

	☒ Eligibility of the Project Type ☒ Start date of the Project activity ☒ Meet applicability conditions in the applied methodology ☒ Credible Baseline ☒ Do No Harm Test ☒ Emission Reduction calculations ☒ Monitoring Report ☒ No GHG Double Counting ☐ Others (please mention below)
Project Verification Criteria: Optional requirements to be assessed	☒ Environmental Safeguards Standard and do-no-harm criteria ☐ Social Safeguards Standard do-no-harm criteria
Project Verifier's Confirmation: The *UCR Project Verifier* has verified the UCR project activity and therefore confirms the following:	The UCR Project Verifier Mr. Shardul Amin, certifies the following with respect to the UCR Project Activity "11.925 MW bundle of Small Scale Hydro Power project by Government of Arunachal Pradesh ☒ The Project Owner has correctly described the Project Activity in the Project Concept Note (PCN)-1 Ver.1 (dated 27/01/2022) & Monitoring Report (MR)-2 Ver.1 including the applicability of the approved methodology A.M.S I. D and meets the methodology applicability conditions and has achieved the estimated GHG emission reductions, complies with the monitoring methodology and has

	calculated emission reductions estimates correctly and conservatively. ☒ The Project Activity is likely to generate GHG emission reductions amounting to the estimated 6,633 tCO_{2e}, as indicated in the MR-2 Ver.1, which are additional to the reductions that are likely to occur in absence of the Project Activity and complies with all applicable UCR rules, including ISO 14064-2 and ISO 14064-3. ☒ The Project Activity is not likely to cause any net-harm to the environment and/or society ☒ The Project Activity complies with all the applicable UCR rules and therefore recommends UCR Program to register the Project activity with above mentioned labels.
Project Verification Report, reference number and date of approval	Verification Report UCR Project ID: 091 Date: 12/01/2024
Name of the authorised personnel of UCR Project Verifier and his/her signature with date	 Mr. Shardul Amin Head Operations Naturelink Solutions Pvt. Ltd.

Project Verification Report

A. Executive Summary

The verification work has been contracted by project aggregator Creduce Technologies Pvt Ltd to perform an independent verification of its UCR project titled **"11.925 MW bundle of Small-Scale Hydro Power project by Government of Arunachal Pradesh. UCR approved project ID:091**, to establish number of CoUs generated by project over the crediting period from 01/01/2022 to 31/12/2022 (both days included).

Verification for the period : 01/01/2022 to 31/12/2022

In my opinion, the total GHG emission reductions over the crediting / verification period stated in the Monitoring Report (MR)-2 Ver.1, submitted to me is found to be correct and in line with the UCR guidelines.

The GHG emission reductions were calculated on the basis of UCR Protocols which draws reference from, Standard Baseline, AMS. I. D – Grid connected renewable electricity generation (Version 18.0). The verification was done remotely by way of video calls, phone calls and submission of documents for verification through emails.

I am able to certify that the emission reductions from the 11.925 MW bundle of Small Scale Hydro Power project by Government of Arunachal Pradesh. UCR (UCR ID – 091) for the period 01/01/2022 to 31/12/2022 amounts to 6,633 CoUs (6,633 tCO_2eq).

Scope

The scope of the verification is the independent, objective review and ex post determination of the monitored reductions in GHG emission by the project activity.

1. The quality of data management and records of underlying data;
2. Completeness and accuracy of calculations and baseline emission reports;
3. Proper inclusion and documentation of all project locations,
4. Correct application of offset rules for filling Baseline Period data gaps;
5. Other data, methods and procedures deemed necessary to establish the accuracy of emission reductions.
6. Agreement stating Assurance to avoid double accounting for the project to be verified, along with required proof.

The project is assessed against the requirements of the UCR programme verification Guidance Document, UCR Standard, UCR Programme Manual and related rules and guidelines. Due professional care has been exercised and ethical conduct has been followed by the assessment team during the verification process. The verification report is a fair presentation of the verification activity. The validation of project is not part of present assignment and projects deemed validated post registration by UCR.

Description of the Project

As described in the Project Concept Note-1 Ver.1 & Monitoring Report-2 Ver.1, the project activity involves hydro project of installed aggregated capacity of 11.925 MW at Dibang Valley, Siang, Lower Siang, Upper Siang district respectively. The details of the project activity are verified with the project report copy submitted for verification.

As mentioned in the Monitoring Report and Emission Reduction Calculation sheet submitted for the verification, the project replaces anthropogenic emissions of greenhouse gases (GHGs) estimated to be approximately 6,633 tCO2e for the said period under verification, there on displacing 7,370 MWh amount of electricity from the generation mix of power plants connected to the Indian electricity grid, which is mainly dominated by the fossil-fuel based power plant.

The project activity is a grid connected renewable energy generation project having capacity of less than 15 MW. The project is a small-scale activity. The methodology applied in the Monitoring Report is verified against the A.M.S I. D "Grid connected renewable electricity generation" version 18.0.

Verified total emission reductions achieved through the project activity during the monitoring period is summarised below:

Summary of the Project Activity and ERs Generated for the Monitoring Period	
Start date of this Monitoring Period	01/01/2022
Carbon credits claimed up to	31/12/2022
Total ERs generated (tCO2eq)	6,633 tCO_2eq
Leakage	0

B. Project Verification team, technical reviewer and approver:

No.	Role	Last name	First name	Affiliation	Involvement in		
					Doc review	Off-Site inspection	Interviews
1.	Lead Verifier & Technical Expert	Amin	Shardul	Head Operations-Naturelink Solutions Pvt. Ltd.	Yes	No	Yes

C. Means of Project Verification

Desk/document review

The project documents submitted to UCR approved verifier Naturelink Solutions Pvt. Ltd. was reviewed by the technical expert and validated by the verifier. The documents reviewed involves verification of legal status of individual project owner for consistency, project related documents like installation and commissioning of equipment used in project activity. Environmental clearances from state or central pollution control board Consent to establish and operate, monitoring related meters/parameters equipment measuring instruments and their calibration records, to establish running of equipment for the crediting period etc.

The PCN-1 Ver.1 is made available to verifier post approval by UCR which is considered as validated documents and the content of validated PCN-1 Ver.1 & MR-2 Ver.1 is considered as record wherever required. Further the communication agreement made between project owner and project aggregator is document of UCR registry hence the project aggregator is treated as authorized representative of project owner. All the documents submitted by project aggregator to verifier is treated as documents submission on behalf of project owner.

The list of submitted document is available in subsequent section of this verification report under section “Document reviewed or referenced”-section I.

On-Site inspection- Not applicable.

Date of off-site inspection: DD/MM/YYYY to DD/MM/YYYY	Not applicable as per UCR guideline site visit not conducted for this verification activity.

No.	Activity performed Off-Site	Site location	Date
1.			

Interviews:

As per UCR guideline the site visit was not conducted during the course of verification instead online interview was conducted.

No.	Interview			Date	Subject
	Last name	First name	Affiliation		

1.	Jummar	Kamdak	Chief Engineer, DHPD	27/10/2023	Project Capacity, location, metering details and its calibration
2.	Rathore	Natasha	Consultant, Creduce Technologies Pvt. Ltd.	27/10/2023	PCN, MR, Emission factor and Emission reduction calculation

Sampling approach:

Out of 16 project sites, 3 sample sites were selected for the verification namely Rina SHP (2 x 1000 kW), Silli MHS (1 x 30kW) and Subbung SHP (2 x 1500 kW). For the verification of monitoring parameter of electricity generation departmental database was made available to verifier and the same has been verified. Data are being monitored on monthly basis. Since physical visit of installation site was not conducted, meter photos, and Technical Specification/Purchase Order Copies are used for the verification.

Clarification request (CLs), corrective action request (CARs) and forward action request (FARs) raised

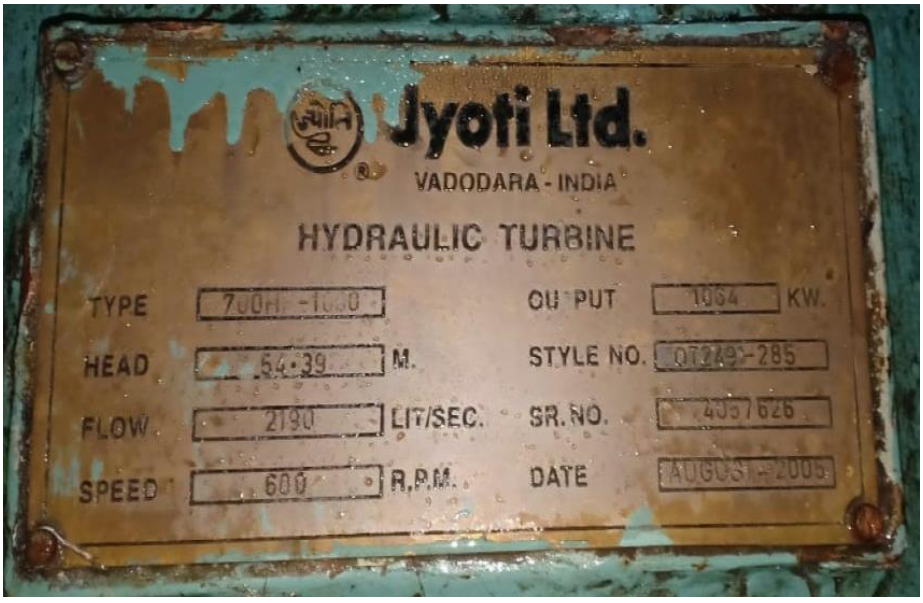
Areas of Project Verification findings	No. of CL	No. of CAR	No. of FAR
Green House Gas (GHG)			
Identification and Eligibility of project type	NIL	NIL	NIL
General description of project activity	NIL	NIL	NIL
Application and selection of methodologies and standardized baselines	--	--	--
- Application of methodologies and standardized baselines	NIL	NIL	NIL
- Deviation from methodology and/or methodological tool	NIL	NIL	NIL
- Clarification on applicability of methodology, tool and/or standardized baseline	NIL	NIL	NIL
- Project boundary, sources and GHGs	NIL	NIL	NIL
- Baseline scenario	NIL	NIL	NIL
- Estimation of emission reductions or net anthropogenic removals	NIL	NIL	NIL
- Monitoring Report	NIL	NIL	NIL
Start date, crediting period and duration	NIL	NIL	NIL
Environmental impacts	NIL	NIL	NIL
Project Owner- Identification and communication	NIL	NIL	NIL
Others (please specify)	NIL	NIL	NIL
Total	NIL	NIL	NIL

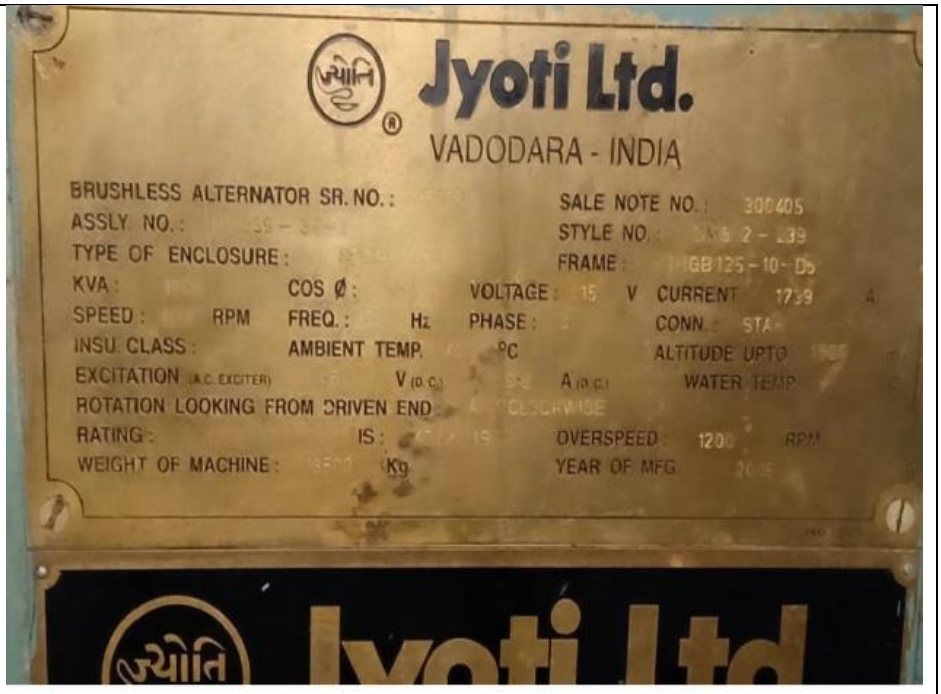
D. Project Verification findings

Identification and eligibility of project type

Means of Project Verification	Project has taken reference of CDM methodology AMS-I D, version 18 Grid Connected Renewable Electricity Generation.
Findings	1. Project activity is described through UCR-approved PCN-1 Ver.1 & MR-2 Ver.1. 2. The UCR project communication agreement clearly defines the Project Proponent and Project Aggregator.
Conclusion	The UCR approved format is used for description and project meets the requirement of UCR verification standard and UCR project standard. UCR project communication agreement submitted to verifier and the same has been verified. Methodology referenced and applied appropriately describing the project type. The eligibility of project aggregator is verified using UCR communication agreement, Project correctly applies the verification standard, UCR project standard and UCR regulations. The project activity is overall meeting the requirements of UCR Verification standard and UCR project standard.

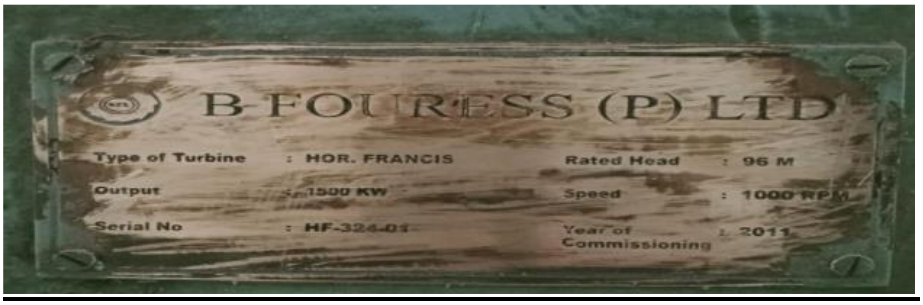
General description of project activity

Means of Project Verification	The project activity involves the setting up of a run-of-river hydro power plants that were commissioned for operation as per the commissioning certificate verified. Each unit of Turbine is coupled with AC generator as verified with the name plate: **Rina SHP** 


Jyoti Ltd.
VADODARA - INDIA
BRUSHLESS ALTERNATOR SR. NO.:
SALE NOTE NO.:
ASSLY. NO.:
STYLE NO.:
TYPE OF ENCLOSURE:
FRAME:
KVA:
COS Ø:
VOLTAGE:
CURRENT
SPEED:
RPM
FREQ.:
Hz
PHASE:
CONN.:
INSU. CLASS:
AMBIENT TEMP.
°C
ALTITUDE UPTO
EXCITATION (A.C. EXCITER)
ROTATION LOOKING FROM DRIVEN END
RATING:
IS:
OVERSPEED:
RPM
WEIGHT OF MACHINE:
Kg
YEAR OF MFG.
Jyoti Ltd

Silli MHS


OSSBERGER
Cross-Flow Turbine
Type
Year
Order No.
Power
kW
Speed
r.p.m.
Flow
l/s
Head
m
Ossberger-Turbinenfabrik
D-8832 Weissenburg/Bayern
FEDERAL REPUBLIC OF GERMANY

	 **Subbung MHS**   The power evacuation at the Substation is confirmed by Electricity generation sheet.
Findings	1. Project Commissioning date is mentioned in the commissioning certificate.

	2. Turbine Capacity is same as mentioned in the name plate and technical specifications. 3. Project implementation and sale of energy abide the power purchase agreement.
Conclusion	The description of the project activity is verified to be true based on the review of PCN-1 Ver.1, MR-2 Ver.1, Commissioning Certificate, Purchase Order Copies and Technical Specification sheet.

Application and selection of methodologies and standardized baselines

(.a.i) Application of methodology and standardized baselines

Means of Project Verification	Project has taken reference of CDM methodology A.M.S I.D. CDM website is referred to check the latest version of the methodology. For the applicability mentioned in the PCN-1 Ver.1 and MR-2 Ver.1, Turbine Specification, Commissioning certificate, Detailed Project Report documents were referred.
Findings	The methodology applied is applicable for the project activity.
Conclusion	Methodology application is appropriate meeting the requirements of UCR and its standardized baseline. The methodology version is correct and valid. Referenced methodology is applicable to project activity.

(.a.ii) Clarification on applicability of methodology, tool and/or standardized baseline

Means of Project Verification	The documents reviewed are A.M.S I. D “Grid connected renewable electricity generation” version 18, UCR Program standard, and UCR Verification Standard.
Findings	Emission factor calculated using the methodology is higher than UCR standard recommends.
Conclusion	Methodology has not been applied “as it is” rather it is referenced. The emission factor considered for the calculation of the emission reductions is verified with the UCR Program Standard. The total installed electrical energy generation capacity of the project equipment does not exceed 15 MW thus meeting the requirement of small-scale project.

(.a.iii) Project boundary, sources and GHGs

Means of Project Verification	Letter from CPCB dated 07/03/2016 No. B-29012/ESS(CPA)/2015-16. PCN-1 Ver.1 section B.4 & MR-2 Ver.1 section C.4.
Findings	Project boundary is appropriately defined in PCN-1 Ver.1 & MR-2 Ver.1 which is physical and geographical site of power house.
Conclusion	Project boundary is correctly defined in revised PCN-1 Ver.1 & MR-2 Ver.1. GHG source correctly identified and reported. The project meets

	the requirements of UCR project standard, Verification standard and methodology requirements for boundary, GHG source.

(.a.iv) Baseline scenario

Means of Project Verification	PCN-1 Ver.1 Section B.5 & MR-2 Ver.1 section B.3 and General Project Eligibility Criteria and Guidance, UCR Standard.
Findings	Declared information is correct and verified.
Conclusion	Baseline scenario is appropriately described. The conservative or default value for emission considered. The baseline scenario is in accordance with UCR project verification standard and UCR project standard.

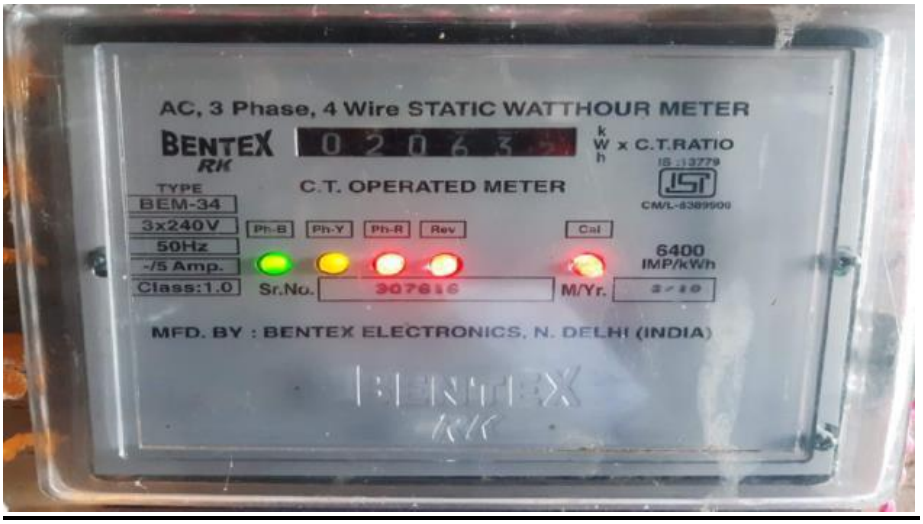
(.a.v) Estimation of emission reductions or net anthropogenic removal

Means of Project Verification	Joint Meter Reading Reports, and General Project Eligibility Criteria and Guidance, UCR Standard, page 4.
Findings	Declared information is correct and verified.
Conclusion	Emission reductions are correctly calculated. The data used are either monitored at plant and hence the emission reduction is reported correctly and meets the requirements of UCR verification standard and UCR project standard.

(.a.vi) Monitoring Report

Means of Project Verification	Joint Meter Reading Reports, and General Project Eligibility Criteria and Guidance, UCR Standard, page 4. Energy meters installed at the site: **RINA SHP**

Silli MHS



Subbung MHS

	
Findings	Declared information is correct and verified.
Conclusion	Monitoring parameter as reported through MR-2 Ver.1 adequately represents the parameters relevant to emission reduction calculation. Department of Hydro Power Development, Arunachal Pradesh ensures the accuracy of data reported. The number of CoUs generation is calculated based on this accurately reported data. The calculation was done using excel sheet where all the parameters reported. The emission factor for electricity is as per UCR standard for electricity component. Based on monitoring and emission reduction calculations are correctly calculated and reported. The monitoring report meets the requirements of UCR project verification requirements.

Start date, crediting period and duration

Means of Project Verification	MR-2 Ver.1, Purchase order of Turbine and technical Specification sheet, Commissioning certificate, Detailed Project Report documents were referred.
Findings	Declared information is correct and verified.
Conclusion	The start date, crediting period and project duration reported correctly and this meets the requirements of UCR verification standard and UCR project standard.

Positive Environmental impacts

Means of Project Verification	MR-2 Ver.1
Findings	Declared information is correct and verified.
Conclusion	The positive environmental impact meets the requirement of UCR verification standard and UCR project standard.

Project Owner- Identification and communication

Means of Project Verification	PCN-1 Ver.1, Communication Agreement, MR-2 Ver.1, Purchase order of Turbine, Commissioning certificate, Power Purchase Agreement.
Findings	Declared information is correct and verified.
Conclusion	Project owner identified through communication agreement signed between PP and PA. Equipment purchase order and commission verified. Also, legal document like Power Purchase Agreement clearly establishes the project owner. The identification and communication correctly meet the requirement of project verification and UCR project standard.

Positive Social Impact

Means of Project Verification	Project has provided temporary employment to local people during its installation and commissioning. Also post commissioning some of people have employed permanently and local people were engaged leading to social financial benefit to surrounding. Overall social impact of project implementation is positive on the surrounding area.
Findings	--
Conclusion	Project has overall positive social impact.

Sustainable development aspects (if any)

Means of Project Verification	Not Applicable
Findings	--
Conclusion	The Project has capability to address SDG 7 Affordable and Clean Energy and SDG 13 Climate Action

E. Internal quality control:

- Due professional care has been taken while reviewing the submitted document.
- There is no conflict of interest as the verifier has no other engagement with either aggregator or project owner directly or indirectly.
- Verification team consists of experience personnel.
- Technical review is performed by experienced and independent person.

F. Project Verification opinion:

Considering the above-mentioned verification conducted on the basis of UCR Protocol, which draws reference from UCR Protocol Standard Baseline, AMS.I. D – Grid connected renewable electricity generation (Version 18.0), the documents submitted during the verification including the data, Project Concept Note (PCN)-1 Ver.1 & Monitoring Report (MR)-2 Ver.1, I am able to certify that the emission reductions from the project - 11.925 MW bundle of Small Scale Hydro

Power project by Government of Arunachal Pradesh. (UCR ID – 091) for the period 01/01/2022 to 31/12/2022 amounts to 6,633 CoUs (6,633 tCO2eq).

G. Abbreviations

Abbreviations	Full texts
UCR	Universal Carbon Registry
CPCB	Central Pollution Control Board
DHPD	Department of Hydro Power Development
MR	Monitoring report
PCN	Project Concept Note
VR	Verification Report
VS	Verification Statement
DAA	Avoidance of Double Accounting Agreement
COD	Commercial Operation Date
PP/PO	Project Proponent / Project Owner
PA	Project Aggregator
PPA	Power Purchase Agreement
ER	Emission Reduction
CoUs	Carbon offset Units.
tCO2eq	Tons of Carbon Dioxide Equivalent
kWh	Kilo-Watt Hour
MWh	Mega-Watt Hour
kW	Kilo-Watt
MW	Mega-Watt
CDM	Clean Development Mechanism
SDG	Sustainable Development Goal
CAR	Corrective Action Request
CL	Clarification Request
FAR	Forward Action Request
GHG	Green House Gas
HEP	Hydro Electric Power

H. Competence of team members and technical reviewers

No.	Last name	First name	Affiliation	Technical Competence
1.	Amin	Shardul	Head Operations-Naturelink Solutions Pvt. Ltd.	Mr. Shardul Amin is a post-graduate having M. Tech in Thermal System Design. He has more than 7 years of experience in the field of waste-to-energy, thermochemical conversion technologies, and emission study. He has previously performed GHG Verification of more than 50 GHG emission reduction projects on UCR.

I. Document reviewed or referenced

No.	Author	Title	References to the document	Provider
1	UCR	Communication Agreement		PA

2	Creduce	Project Concept Note (PCN)-1 ver. 1		PA
3	Creduce	Monitoring Report (MR)-2 Ver.1		PA
4	Creduce	Avoidance of double accounting		PA
5	Creduce	Emission Reduction Excel		PA
6	DHPD & PP	Energy Generation Sheet (2022)		PA
7	DHPD	Commissioning Certificate		PA
8	PP	Purchase order of Turbine		PA
9	PP	Purchase order of Generator		PA

J. Clarification request, corrective action request and forward action request

Table 1. CLs from this Project Verification

CL ID	XX	**Section no.**		**Date:** DD/MM/YYYY
Description of CL				
Project Owner's response				**Date:** DD/MM/YYYY
Documentation provided by Project Owner				
UCR Project Verifier assessment				**Date:** DD/MM/YYYY

Table 2. CARs from this Project Verification

CAR ID	xx	**Section no.**		**Date:** DD/MM/YYYY
Description of CAR				
Project Owner's response				**Date:** DD/MM/YYYY
Documentation provided by Project Owner				
UCR Project Verifier assessment				**Date:** DD/MM/YYYY

Table 3. FARs from this Project Verification

FAR ID	xx	**Section no.**		**Date:** DD/MM/YYYY
Description of FAR				

Project Owner's response	**Date:** DD/MM/YYYY
Documentation provided by Project Owner	
UCR Project Verifier assessment	**Date:** DD/MM/YYYY

ANNEXURE I: Photographs of the Power Plant

Figure-1: Rina SHS (2 x 1000 kW)

TG Set of Rina SHP (2 x 1000 kW) installed on TG Deck

Control Room of Rina SHP (2 x 1000 kW)

Figure-2: Silli MHS (1 x 30 kW)

Photograph of TG Set of Silli MHS (1 x 30 kW)

Figure-3: Subbung MHS (2 x 1500 kW)

Photograph of TG Set installed on TG Deck of Subbung SHP (2 x 1500 kW)