



**Verified Carbon
Standard**

HANUMAN GANGA HYDRO (4.95 MW) PLANT AT UTTARAKHAND



Document Prepared By: LGAI Technological Center, S.A. (Applus+ Certification)

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Summary:

Verification purpose: LGAI Technological Center S.A. (Applus+ Certification) (Hereafter referred as Applus+ Certification) has been appointed by M/s Regency Aquaelectro & Motelresorts Ltd. to perform the 2nd periodic verification of the project activity “Hanuman Ganga Hydro (4.95 MW) Plant at Uttarakhand” VCS ID 274¹. The main purpose of this verification activity is to have an independent third party for the assessment of the project design, monitoring report to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements

The project activity is 4.95 MW run-of-river small hydro power project at Hanuman Chatti Village, Uttarkashi district, Uttarakhand, Phase I of project activity was commissioned on 24/03/2005 and Phase II on 19/04/2008. The electricity generated from the project activity is supplied to NEWNE grid (now Indian Grid), which is mainly dominated by thermal/fossil fuel-based power plant. The power generated by the project activity is being sold to respective State Electricity Board.

Start date of the project activity is 24/03/2005. This is the day on which Phase I (3 MW) project commissioned as per the registered VCS PD dated 15/11/2009 and final validation report dated 18/11/2009. An undertaking has been submitted by PP for double counting would never happens with the any other GHG program. During the current monitoring period, project activity undergoes continued operation and no major breakdown had taken place.

The scope of the verification is the independent and objective review of the monitoring report (MR). The MR is reviewed against the relevant criteria (see above) and decisions by the CDM Executive Board and VCS executive board, including the approved baseline and monitoring methodology. The verification was based on the guidance given in the, review against registered VCD PD and Validation Report, and VCS program guideline and standard version 4.0

This is 2nd verification under VCS and covers this activity from 01/04/2010 to 27/03/2016 (inclusive both days). The total emission reductions achieved for the project activity during the monitoring period has been 39,492 tCO_{2e}. The VCS crediting period is of 10 years (Fixed). The start date of crediting period is 28/03/2006 and 27/03/2016 is the end date of the crediting period. An undertaking from the project participant confirms that project will not claim any other scheme benefits for the concerned monitoring period.

¹ <https://registry.verra.org/app/projectDetail/VCS/274>

A risk-based approach has been followed to perform this verification activity. In the course of verification, 06 Corrective Action requests (CAR), 00 Clarification Requests (CLs) and 00 Forward action requests (FARs) were raised and successfully closed. The review of the monitoring report and additional documents related to baseline and monitoring methodology; the subsequent background investigation, follow-up interviews and PP have provided DOE with sufficient evidence to verify the fulfilment of the stated criteria of VCS.

The assessment team has employed a risk-based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the MR. The main focus of the assessment team is to identify the significant risks for the project implementation and the generation of VERs. The verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the monitoring report combined.

The only purpose of the verification is its usage during the issuance process as part of the VCS project cycle. Therefore, LGAI Technological Center S.A. (Applus+ Certification) can't be held liable by any party for decisions made or not made based on the verification opinion, which will go beyond that purpose.

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. No sampling procedure applied for site visit or document verifications. The entire documents checked/plant verification conducted to arrive at positive verification conclusions.

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1 INTRODUCTION

1.1 Objective

LGAI Technological Center S.A. (Hereinafter referred as Applus+ Certification) has been appointed by “M/s Regency Aquaelectro & Motelresorts Ltd.” to perform the 2nd periodic verification of the project entitled “Hanuman Ganga Hydro (4.95 MW) Plant at Uttarakhand” under VCS standard and guideline version 4.0. The objective of this verification activity is to have an independent third party for the assessment of the project design, monitoring report and final verification report and to ensure a thorough assessment of the proposed project activity against the applicable CDM and VCS requirements. In particular;

- the project's baseline is assessed against “AMS-I.D version 13”
- the project’s monitoring plan is assessed against “AMS-I.D version 13”
- the project’s compliance with the requirements of Article 12 of the Kyoto Protocol, the CDM Modalities and Procedures as agreed in the Marrakech Accords under decision 3/CMP.1, the annexes to this decision, subsequent decisions and guidance made by COP/MOP & CDM Executive Board and other relevant rules, including the Host Country legislation and sustainability criteria along with VCS guideline and standard version 4.0
- CDM Validation and Verification Standard for project activities, version 02.0
- CDM Project Standard for project activities, version 02.0
- CDM project cycle procedure for project activities, version 02.0
- VCS standard, version 4.0
- VCS guideline, version 4.0

Verification is a requirement for all VCS projects and is seen as necessary to provide assurance to stakeholders of the quality of the project and its intended generation of estimated verified emission reductions (VERs).

1.2 Scope and Criteria

The scope is defined as an independent and objective review of the Monitoring report (MR) prepared as per the registered PD and registered approved methodology AMS-I.D version 13. The MR is reviewed against the criteria stated in Article 12 of the Kyoto Protocol, the CDM modalities and procedures as agreed in the Marrakech Accords and the relevant decisions by the CDM Executive Board and VCS standard and guideline version 4.0, including the approved baseline and monitoring methodology AMS-I.D version 13. The verification was based on the requirements in the VCS program guideline and standard version 4.0

The audit team has employed a risk-based approach to assess the completeness and accuracy of the claims and conservativeness of the assumptions in the MR. The main focus of the audit team is to identify the significant risks for the project implementation and the generation of

VERs. The verification is not meant to provide any consulting towards the project participants. However, stated requests for clarifications and/or corrective actions may have provided input for improvement of the Monitoring report. In line with Guidelines for Application of materiality in verifications, the verification team has conducted a complete verification of all the information presented in the monitoring report and data monitored as presented in the emission reduction calculation spread sheet. It invoices follows the paper trail back to the raw data such as meter reading records and invoices. There are no material errors, overestimation of ER, omission or misstatement. No sampling is used as the verification team has visited the WTGs along with the substations. The verification team has reviewed all the documents like commissioning certificates, JMR, invoices etc.

1.3 Level of Assurance

The verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. The entire documents checked/Power plant verification conducted to arrive at positive verification conclusions

1.4 Summary Description of the Project

The main purpose of this project activity is to generate clean form of electricity through Hydro power source. The project activity is 4.95 MW run-of-river small hydro power project at Hanuman Ganga Nallah near Hanuman Chatti Village in Uttarkashi district of Uttarakhand state. Phase I of project activity was commissioned on 24/03/2005 and Phase II on 19/04/2008. The project activity lies between Lat. 30°55'50"N and Long. 78°24'20"E.

The Project activity is a new facility (Greenfield) and the electricity delivered by the project activity is exported to the NEWNE grid (now Indian grid). The project will therefore displace an equivalent amount of electricity which would have otherwise been generated by fossil fuel dominant electricity grid. The PP has entered into long term Power Purchase Agreement with Uttarakhand Power Corporation Ltd.

During the Current Monitoring Period from 01/04/2010 to 27/03/2016(First and last date included) the project activity has supplied 49,183.66 MWh of electricity, and thus contributing to the GHG reductions 39,492 tCO_{2e}.

2 VERIFICATION PROCESS

2.1 Method and Criteria

Verification Process: The project assessment is based on the Clean Development Mechanism Validation and Verification Standard for project activities, version 02.0 and VCS standard and guideline, version 4.0 and is conducted using standard auditing techniques to assess the correctness of the information provided by the project participants. Before the assessment begins, members of the team covering the technical scope(s), sectoral scope(s), and relevant host country experience for evaluating the VCS project activity are appointed.

Once the project is received by the assessment team, the members of the assessment team carried out:

- I. A desk review of the monitoring Report against the registered PD;
- II. Follow-up interviews with project participant;
- III. The resolution of outstanding issues and the issuance of the final verification report and opinion.

The prepared verification report and other supporting documents then undergo an internal quality control at the HQ (Accredited office) before being submitted to the VCS executive board.

In order to ensure transparency, assumptions must be clear and stated explicitly and background material must also be referenced. LGAI Technological Center, S.A. (Applus+ Certification) has developed a specific checklist customized for the project. The checklist demonstrates, in a transparent manner, the project criteria (requirements), discussion on each criterion by the assessment team, and the results from verifying the identified criteria.

Appointment of the assessment team

According to the sectoral scope / technical area and experience in the sectoral or national business environment, LGAI Technological Center S.A. (Applus+ Certification) has composed a project assessment team in accordance with the appointment rules in the internal Quality Management System of LGAI Technological Center S.A. (Applus+ Certification).

The composition of audit team shall be approved by the LGAI Technological Center S.A. (Applus+ Certification) ensuring that the required skills are covered by the team.

The four qualification levels for team members that are assigned by formal appointment rules are as presented below:

- Lead Auditor (LA).
- Auditor (A) / Auditor in Training (AiT).
- Technical Expert (TE).
- Technical Reviewer (TR).

The sectoral scope / technical area knowledge linked to the applied methodology/ies shall be covered by the assessment team.

Name	Role	SS Coverage	TA Coverage	Financial aspect	Host country experience
Mr. Sukanta Das	LA/TE	YES	YES	NA	YES
Mr. Denny Xue	TR	YES	YES	NA	NA

The complete list of CVs is included as Appendix 3 of this report.

Document review

The Monitoring Report version 1 submitted by the PP was reviewed against the approved methodology, registered PD, final validation report and other relevant criteria to verify the correctness, credibility, and interpretation of the presented information. Furthermore, a cross-check between information provided and information from other sources has been done. A complete list of all documents and evidence material reviewed is included in this report below in appendix 1.

Follow-up interviews

An onsite audit was conducted by LGAI Technological Center S.A. (Applus+ Certification) who performed interviews, telephone conferences with project stakeholders to confirm selected information and to resolve issues identified in the document review. The detail is provided in this report in the below sections.

Resolution of Clarification and Corrective Action Request

The objective of this phase of the Verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for Applus+ Certification positive conclusion on the Monitoring report. The Corrective Action Requests and Clarification Requests raised by Applus+ Certification were resolved during communications between the Client and Applus+ Certification to guarantee the transparency of the verification process, the concerns raised and responses given are summarized below in the Appendix 2.

The final MR Version 2 submitted by PP on 24/03/2021 serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main VCS objectives. The two VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country

Internal quality control

As final step of a verification of the final documentation including the final verification report and the checklist have to undergo an internal quality control by the technical review committee, i.e. each report has to be finally approved either by the head of the technical review committee

or the deputy. In case one of these two persons is part of the assessment team approval can only be given by the other one to avoid any conflict of Interest.

After confirmation of the project owners the positive verification opinion and relevant documents are submitted to the VCS secretariat through the VCS web-platform.

2.2 Document Review

The details of the document observed during the verification process are listed below in Appendix 1 of this report.

2.3 Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Sharma	Saurabh	PP representative	25/01/2021	Implementation of the project and monitoring. Baseline emission calculation, achieved emission reduction for the monitoring period, monitoring process followed onsite	Mr. Sukanta Das
2	Saha	Tapti	Consultant, EKI Energy Services Ltd.	25/01/2021	Baseline emission calculation, achieved emission reduction for the monitoring period	

2.4 Site Inspections

Duration of On-site inspection : 25/01/2021				
Sr.No.	Activity performed on-site	Site location	Date	Team member
1.	<p>Assessment team checked the implementation of the project, Baseline emission, Emission reduction calculation, technical description of the project and Monitoring.</p> <p>Assessment team also checked that whether the monitoring plan as described in the VCS PD is actually practised onsite. Also assessment team checked any change in host country criteria which may affect the baseline of the project activity.</p>	Chatti Village, Uttarakashi, Uttarakhand	25/01/2021	Mr. Sukanta Das

2.5 Resolution of Findings

The objective of this phase of the verification was to resolve the requests for corrective actions and clarification and any other outstanding issues which need to be clarified for LGAI Technological Center S.A. (Applus+ Certification)'s positive conclusion on the project design and Monitoring report. The Corrective Action Requests and Clarification Requests raised by LGAI Technological Center S.A. (Applus+ Certification) were resolved during communications between the Client and LGAI Technological Center S.A. (Applus+ Certification) to guarantee the transparency of the validation process, the concerns raised and responses given are summarized below in the Appendix 2.

The final MR Version 2 submitted by project owners on 24/03/2021 serves as the basis for the final assessment presented. Additional changes to the project during the verification process are not considered to be significant with respect to the main CDM/VCS objectives. The two CDM/VCS main objectives are the reduction of anthropogenic GHG emissions and the contribution of sustainable development to the host country.

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Project design document and Monitoring report	00	00	00
Description of project activity	00	02	00
Application of selected baseline and monitoring methodology and selected standardized baseline			
- Applicability of methodology and standardized baseline	00	00	00
- Deviation from methodology	00	00	00
- Clarification on applicability of methodology, tool and/or standardized baseline	00	00	00
Project boundary	00	00	00

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Establishment and description of baseline scenario	00	00	00
Demonstration of additionality	00	00	00
Emission reductions	00	01	00
Calibration details	00	01	
Monitoring plan	00	00	00
No Net harm assessment	00	01	
Local stakeholder consultation	00	01	
Others (please specify)	00	00	00
Total	00	06	00

The list of findings and their resolution is presented in Appendix 2 of this report.

2.5.1 Forward Action Requests

This is 2nd periodic verification of the project activity and no FAR was raised from previous and during this verification process.

2.6 Eligibility for Validation Activities

This section is not applicable for present verification, as Applus+ Certification holds the accreditation for Validation of projects under this sectoral scope.

3 VALIDATION FINDINGS

3.1 Participation under Other GHG Programs

Project activity has not participated under other GHG program. However, Project was applied in CDM but did not move forward for registration due to internal decision taken by management.

3.2 Methodology Deviations

The project activity used AMS-I.D version 13 which is as per the registered VCS PD and thus no deviation is sought regarding the methodology. The project complies with all the requirement of the methodology and thus deviation to the methodology is not a requirement for the present project activity.

3.3 Project Description Deviations

There is no deviation request by PP during this monitor. Also, verification team checked the previous monitoring report and verification report and confirms that there is no deviation applied in previous verification.

3.4 Grouped Project

The project do not involve any addition of new project activity and thus the project do not falls under grouped project.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

During the onsite audit with PP representative, it was concluded that the project is implemented as per the instruction of the VCS PD and this is verified from the commissioning certificate. During the current monitoring period it was observed that Plant was shut down from August 2012 to February 2014 due to floods and restoration work. The same was verified through the breakdown summary sheet of the project activity. Scheduled maintenance was also carried out as per the instruction of the manufacturer and the same is acceptable to the assessment team.

Project location is confirmed by the assessment team through GPS meters during onsite visit and also cross checked the same via google software. Assessment team also checked latitude and longitude mentioned in the VCS PD and confirmed that the details as mentioned in the registered PD are correct. The latitude and longitude of the project activity is given below;

District	State	Latitude	Longitude
Uttarkashi	Uttarakahand	30° 55' 50'' N	78° 24'20''E

The technical specifications have been verified with the name plates as well as with the technical specifications of hydro turbine and also cross checked from the technical manual of the Manufactures. The technical data of the project activity is given below:

Technical data of the project

Description	1.5 MW x 2	1.95 MW
Type of Diversion Weir	Trench	Trench
Length of Power Tunnel	1380 m	1380 m
Design Discharge of Power Tunnel	2.65 cumec	1.51 cumec
Design Discharge of Penstock	2.3 cumec	1.5 cumec
Shape of Tail Race	Trapezoidal	Trapezoidal
Design Head	155 M	155 M
TURBINE DETAILS		
Type	Horizontal Francis	Horizontal Francis
No	2	1
Output at Max. Head of 154 M	1580 KW	1950 KW

Rated Speed (RPM)	1500	1500
Runaway Speed (RPM)	2712	2712
Rated Flow (at 100 % Load)(cumec)	1.141	1.323
GENERATOR DETAILS		
Phase	3	3
Connections	Star	Star
Rated Speed (RPM)	1500	1500
Capacity (KW)	1500	1950
Power Factor	0.85	0.85
Terminal Voltage (V)	3300	3300
Exciter	Brush Less Excitation System Voltage 63 V Current 350 Amp Excitation Voltage 80 V Excitation Current 8 Amp Class of Insulation 'f'	Brush Less Excitation System Voltage 106V Current 213 Amp Excitation Voltage 76 V Excitation Current 6.2Amp Class of Insulation 'f'

Assessment team checked the commissioning certificate of all units and confirms that the commissioning dates are correct.

The assessment team confirmed through onsite visit with PP representative that there is no changes in to the project design during this monitoring period. It was found that the monitoring plan was implemented as per the requirement of the VCS PD & approved monitoring Plan and approved methodology AMS.I-D version 13. The organisational role and responsibility as mentioned in the registered VCS PD is followed onsite. The calibration of energy meter is done as per the required frequency mentioned in the VCS PD. All the emergency preparedness as mentioned in the registered VCS PD is followed onsite and no discrepancies were found regarding the same.

The Project participant contribution from the project activity towards sustainable development in accordance to NCDMA as explained below:

Social well-being:

- The project helps in generating employment. The project activity leads to development in infrastructure in the region like development of roads and also may promote business with improved power generation.

Economic well-being:

- The project is clean technology investment in the area, thus leading to the overall development of the region and helping demand supply gap in the state.
- The project activity generates power using zero emissions hydro based power generation which helps to reduce GHG emissions and specific pollutants like

SO_x, NO_x, and SPM associated with the conventional thermal power generation facilities.

Environmental well-being:

- The project activity being a renewable source of energy, it reduces the dependence on fossil fuels and conserves natural resources which are on the verge of depletion. Due to its zero emission the project activity also helps in avoiding significant amount of GHG emissions

Technical well-being:

- The operation of project activity leads to promotion of hydro based power generation and encourages other entrepreneurs to participate in similar projects.

It was observed during the verification process is that project the project was applied under CDM mechanism, however due to the internal reason project promoter has decided not to go under CDM mechanism and PP has submitted declaration that project has not claimed other form of GHG credit for the concerned monitoring period the project has been terminated.

The project is not involved in any other form of GHG emission program and VERs generated from this verification will not be used for other trading program to avoid any kind of double counting. The same is confirmed by the PP during the verification site visit. Assessment team also conducted independent review regarding the same and found that the statement of the PP is accurate and project is not involved in any other kind of GHG trading for the present verifications/monitoring period.

The assessment team observed that the project is in line with the registered PD and applied methodology and thus no clarification/deviation is sought. CAR 01 and CAR02 were raised during the verification process and closed successfully. Please refer below Appendix 2 for the detail closure of the CAR

Assessment team confirms following during the verification site visit:

1. Start date of the project is 24/03/2005 which is commissioning of Phase I (as per commissioning Certificate).
2. An undertaking letter dated: 05/02/2021 has been submitted by PP for double counting with any other GHG program. PP also has given a written declaration that project has not claimed other form of GHG credit for the concerned monitoring period.
3. Assessment team confirms that this is the 2nd monitoring under VCS and covers the activity from 01/04/2010 to 27/03/2016 (inclusive of both dates). Thus, VCS crediting period is 10 years (fixed) till end date of crediting period. 28/03/2006 is the start date and 27/03/2016 is the end date of the crediting period.

The GHG credits from 01/04/2010 to 27/03/2016 will be claimed under VCS only. At any point of time during the crediting period, the project proponent will abide by the “Double Counting”.

4. Assessment team checked and found that the Project proponent of the project activity is as below for the current monitoring period:

Organization name	M/s Regency Aquaelectro & Motelresorts Ltd.
Contact person	Mr. Arun Sharma
Title	Managing Director
Address	River View Lane, Regency Complex, Paonta Sahib, Himachal Pradesh
Telephone	01704-223431, 01704-224431
Email	aphregency@yahoo.co.in

5. Assessment team also checked the details of other entity and found that Other entity involved in this project is

Organization name	EKI Energy Services Limited
Contact person	Tapti Saha
Title	Assistant Manager
Address	EnKing Embassy, Office No. 201, Plot No. 48, Scheme No. 78, Part II, Vijay Nagar INDORE - 452010, India.
Telephone	Mobile: +91 9770900207
Email	tapti@enkingint.org / registry@enkingint.org

6. The quantified emission reduction calculation for the monitoring period is correct and conservative. Assessment team also compared actual VER with the estimated VER and found that the actual VER is 39,492 tCO_{2e} which is 51.4% lower than the the estimated emission reduction 81,309 tCO_{2e} (18,422 tCO_{2e}/ 365 days x (2188-577) days) during this monitoring period. this monitoring period which is due to lower water availability, non-operational days due to climatic condition and low PLF attained by the power plant during the current monitoring period also Plant was close due to flood and restoration work as confirmed by PP through declaration letter dated 05/02/2021. From Aug 12 to Feb 14, there was non-operative period of 577 days due to flood loss. Due to restoration work in August, 2012, flood in April, 2013 to February, 2014 there was no generation in the plant.

4.2 Safeguards

4.2.1 No Net Harm

No potential environment or socio-economic matter was found during the site visit. The project is renewable energy sources i.e. small hydro project and thus no negative impact observed onsite. The project activity has no significant impact on the environment. Further this project will have no air pollution, no water pollution and no noise pollution. The project activity has obtained the No Objection Certificate for Consent to Establish from the concern agencies. The project activity does not cause any harm to the local ecology. It primarily requires the installation of the Hydro power project, interfacing the generators with the State Electricity Board by setting up HT transmission lines and installation of other accessories. Also, as per the Central Pollution Control Board of India notification small hydro project of less than 25 MW falls under White Category and are practically non-polluting. CAR 03 was raised during the verification process and closed successfully.

4.2.2 Local Stakeholder Consultation

All the stakeholders are happy with the implementation and operation of the project activity and no negative comments envisaged for the project activity. There was no change in project description from the VCS PD. Complaint/suggestion/feedback register is maintained at site as a part of ongoing communication with stakeholders in line with clause 3.16.17 of VCS Standard, ver. 4.0 and appropriate actions taken time to time by PP. Assessment team confirmed the same during the on-site audit and document review i.e. grievance register etc. CAR 04 was raised during the verification process and closed successfully.

4.3 AFOLU-Specific Safeguards

Not applicable

4.4 Accuracy of GHG Emission Reduction and Removal Calculations

Means of verification	The verification team assessed whether the data and calculations of GHG emission reductions achieved resulting from the MR. The verification team has checked whether calculations of baseline GHG emissions, project GHG emissions and leakage GHG emissions have been carried out in accordance with the formulae and methods described in the monitoring plan of the VCS PD and MR.
Findings	CAR05 was raised on this section and closed successfully. Please refer Appendix 2 for further details
Conclusion	<u>Ex-ante parameters:</u> Combined margin CO ₂ emission factor of grid (EF _y) is fixed ex-ante for the entire crediting period and as per the VCS PD, same is fixed 0.803 tCO ₂ /MWh. Values are as follows:

	<p> $EF_{OM,y} = 1.0086 \text{ tCO}_2/\text{MWh}$ $EF_{grid,BM,y} = 0.5977 \text{ tCO}_2/\text{MWh}$ $EF_y = 0.803 \text{ tCO}_2/\text{MWh}$ </p> <p> Verification team confirms that the same is used in the emission reductions calculations. </p> <p> <u>Baseline emission:</u> The baseline Emissions for a given year is calculated by multiplying the energy baseline (EB) with the regional grid emission factor of the grid. </p> <p> Formula Used:- </p> <p> $BE_y = EG_y * EF_y$ BE_y - baseline emissions in year y (tCO₂) EG_y - Net electricity exported to the grid electricity exported by hydro power plant (electricity generated minus auxiliary electricity) minus electricity imported from the NEWNE grid) EF_y - CO₂ baseline emission factor of the grid in year y (t CO₂/MWh) </p> <p> Ex-post parameter: </p> <p> EG_y - Net electricity exported to the grid electricity exported by hydro power plant (electricity generated minus auxiliary electricity) minus electricity imported from the NEWNE grid): </p> <p> Net electricity supplied to grid is calculated as the difference between “export” and “import” of electricity through the trivector energy meters (main and check) installed at substation of State Electricity Board. The meters are in sealed condition and in the jurisdiction of the UPCL. Monthly joint meter reading of the meters at the interconnection point is taken by the designated PP representative and UPCL. </p> <p> Net electricity supplied to the grid during the current monitoring period 49, 183.66 MWh which is sourced from Joint meter readings. </p> <p> The verification team has crosschecked the emission reduction sheet and monitoring report data with the JMR sheet and invoice bills and found that PP has used conservative values (Minimum of JMR and Invoice values). </p> <p> All relevant monitoring parameters have been verified with regard to the appropriateness of the applied measurement/determination method, the correctness of the values applied for ER calculation, the accuracy, and applied QA/QC measures. </p> <p> Baseline emission factor is calculated as combined margin, consisting of a combination of operating margin (OM) and build margin (BM) factors. </p> <p> $BE_y = 49, 183.66 \text{ MWh} \times 0.803 \text{ tCO}_2\text{e}/\text{MWh}$ </p>
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	<p>= 39,492 tCO₂e (round down values)</p> <p>Project Emission (PE_y): The project activity is run-of-river small hydro project. As per applied methodology AMS -I.D version 13 and the VCS PD project emission is considered zero.</p> <p>Leakage: As per applied methodology AMS -I.D version 13 and VCS PD, Leakage emissions are not considered for the project activity.</p> <p>Hence, E_{Ry}= B_{Ey}- P_{Ey}-L_y= 39,492 tCO₂e- 0-0= 39,492 tCO₂e (round down values)</p>
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4.5 Quality of Evidence to Determine GHG Emission Reductions and Removals

Means of verification	<p>The verification team checked the break down log for the monitoring period. During the verification site visit the energy meters are also checked. The Calibration details of the monitoring meters are also checked with calibration certificates.</p>
Findings	<p>CAR 06 was raised on this section and closed successfully. Please refer Appendix 2 for further details</p>
Conclusion	<p>The metering arrangement is tri-vector bi-directional energy meters of accuracy class 0.5s (main and check). Main meter is make of Secure and Check meter is make of L & T. These electricity meters are being used by state electricity board for monthly generation reports.</p> <p>The Net electricity supplied to the grid is then calculated from export and import values. The electricity Export, Import and Net electricity exported to the grid are cross checked from the invoices raised to respective state electricity board which is in line with Methodology requirement for small scale project activity. Hence assessment team confirmed that the value of net electricity exported to the grid as used in emission reduction calculation is correct.</p> <p>The meters are monitored continuously and cumulative readings are taken at the end of the month by joint meter reading procedures. All the energy meters are under the control of state utility These are sealed by the state Utilities. The calibration frequency of meters is once in three year. The Calibration details of meters are provided in Appendix 5. No delay in Calibration is observed by the assessment team for the current monitoring period. The meters are calibrated by the meter testing division of the state utility in the presence project participant representative and state utilities office to ensure the working of meter within permissible limits. Verification team checked the calibration details of the monitoring meters with calibration certificates submitted by PP and confirms that meters are calibrated as per calibration frequency mentioned in the registered JOINT VCS PD & MR. Calibration details are</p>

	<p>provided in Annexure -5 of this report.</p> <p>No unforced error observed and feeder wise WTGs location is also checked and found correct. Verification team confirms that the energy meters are made of Secure of accuracy class of 0.5s, are calibrated as per the national standards followed by the electricity board</p>
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4.6 Non-Permanence Risk Analysis

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Not applicable	Not applicable	Not applicable	Not applicable

5 VERIFICATION CONCLUSION

Applus+ Certification has been engaged by M/s Regency Aquaelectro & Motelresorts Ltd. to perform the verification of the “Hanuman Ganga Hydro (4.95 MW) Plant at Uttarakhand”

M/s Regency Aquaelectro & Motelresorts Ltd. is responsible for the preparation of the GHG emissions data and the reported/estimated GHG emissions reductions on the basis set out within the project’s Monitoring Plan in the VCS PD and MR and the approved methodology AMS.I-D version 13.

Our verification approach was based on the requirements as defined under the Kyoto Protocol, Marrakesh accord, as well as those defined by the CDM Executive Board. Our approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these. Further, the verification has been planned and organized to achieve a Reasonable Level of assurance as per the requirement of VCS. No sampling procedure applied for site visit or document verifications. The entire documents checked/Power plant verification conducted to arrive at positive verification conclusions. The verification team can confirm that:

- the project is operated as planned and described in the project document;
- the monitoring plan is as per the applied methodology;
- the monitoring process in Monitoring Report is as per the PD
- the development and maintenance of records and reporting procedures are in accordance with the monitoring plan;
- the installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately;
- the monitoring system is in place and generates GHG emission reductions data;
- the GHG emission reductions are calculated without material misstatements.
- A Reasonable Level of assurance was achieved as planned during verification process.
- Verification period: 01/04/2010 to 27/03/2016(inclusive of both days)

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

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2010	7,941	0	0	7,941
2011	13,688	0	0	13,688
2012	7,442	0	0	7,442
2013	0	0	0	0

Year	Baseline emissions or removals (tCO ₂ e)	Project emissions or removals (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Net GHG emission reductions or removals (tCO ₂ e)
2014	4,167	0	0	4,167
2015	5,315	0	0	5,315
2016	939	0	0	939
Total	39,492	0	0	39,492

APPENDIX I: DOCUMENTS REVIEWED DURING VALIDATION AND VERIFICATION

No.	Author	Title	References to the document	Provider
1.	NA	Commissioning certificate	Commissioning of the Hydro turbine unit	Project participant
2.	NA	Contract of the other entity with the DOE	Contract of the other entity with the DOE	Project participant
3.	NA	Technical specifications	Technical specifications of turbines	Project participant
4.	NA	Power Purchase agreement for the project activity Supplementary PPA	Dated 31/03/2003 Dated 04/08/2015	Project participant
5.	NA	VCS Project Description	15/11/2009	Project participant
6.	NA	Initial Monitoring report Final Monitoring Report	Version 1, dated 16/12/2020 Version 2, dated 24/03/2021	Project participant
7.	NA	Emission Calculation sheet	Version 1, dated 16/12/2020	Project participant
8.	NA	Emission Calculation sheet	Version 2, dated 24/03/2021	Project participant
9.	NA	Tools/ guidelines used in the project activity <ul style="list-style-type: none"> • UNFCCC Methodology: AMS-I.D version 17 • VCS verification report template Version 4.0 • VCS Standard, version 4.0 	UNFCCC CDM web site VERRA website	UNFCCC & VERRA
10.	NA	Calibration details of the project activity undergoing verification	Calibration certificates	Project participant
11.	NA	JMR records+ Invoices for the complete monitoring period	JMR copies Invoices for the complete Monitoring period	Project participant
12.	NA	Break down details of the complete monitoring period	Log Sheet	Project participant
13.	NA	VCS Declaration from PP for Participation under Other GHG Programs	Dated 05/02/2021	Project participant
14.	NA	Verification report for 1 st verification of project activity by TUV NORD	Version 01 dated 08/06/2012	Project participant
15.	NA	Declaration of closing plant	05/02/2021	Project Participant

APPENDIX 2: CORRECTIVE ACTION REQUESTS, CLARIFICATION REQUESTS AND FORWARD ACTION REQUESTS (CAR/CL/FAR)

Project Implementation Status

CAR ID	01	Date: 25/01/2021
Description of CAR		
<p>Breakdown details missing in the MR. Moreover, the supporting document like “plant logbook” regarding the breakdown details are not provided to the assessment team.</p> <p>Corrective action is sought.</p>		
Project participant response		Date: 24/03/2021
<ol style="list-style-type: none"> Break down detail has been provided in Appendix I. 		
Documentation provided by project participant		
Break Down Detail		
DOE assessment		Date: 30/03/2021
<p>PP has now included the breakdown details in Appendix 1 of revised monitoring report and also submitted the plant logbook. Verification team has checked the break down details from plant logbook and found that electricity export and Import from August 2012 to February 2014 due to major overhaling and restoration work affected due to floods. Also, JMR and Invoices are not available to PP due to no generation in plant. Hence acceptable to VVB.</p> <p>CAR closed.</p>		

CAR ID	02	Date: 25/01/2021
Description of CAR		
<p>During the review of documents submitted by PP, it was found that the following documents are missing;</p> <ol style="list-style-type: none"> Commissioning date of Phase II (1.95 MW) is not consistent with the date provide in 		

commissioning certificate of the same. 2. Undertaking in effect of no double counting of VCS emission reductions achieved will take place in other GHG Programs/Other forms credits for the concerned Monitoring period. PP is requested to the provide the above documents to assessment team.	
Project participant response	Date: 24/03/2021
1. Commissioning Certificate of Phase II has been provided to DOE. 2. Undertaking in effect of no double counting of VCS emission reductions achieved will take place in other GHG Programs/Other forms credits for the concerned Monitoring Period has been provided.	
Documentation provided by project participant	
1. Commissioning Certificate 2. VCS Undertaking	
DOE assessment	Date: 30/03/2021
1. PP has now provided the correct commissioning certificate of Phase II (1.95 MW). Verification team has checked the commissioning certificates of both phases and confirms that first phase was commissioned on commissioning 24/03/2005 and second phase on 19/04/2008. Thus, CAR closed.	

No Net Harm

CAR ID	03	Date: 25/01/2021
Description of CAR		
Supporting document are not shared with DOE related to claim made under “No Net Harm” in MR against the requirement of sub para 3.16.1 of VCS standard.		
Project participant response		Date: 24/03/2021
Weblink of supporting document has been provided in section 2.1.		
Documentation provided by project participant		
Revised MR (version 02)		
DOE assessment		Date: 30/03/2021
The project activity does not cause any harm to the local ecology. The project activity has obtained the No Objection Certificate for Consent to Establish from the concern agencies. Verification team has also checked the central Pollution Control Board notification available at http://moef.gov.in/wp-content/uploads/2017/07/Latest_118_Final_Directions.pdf and confirms		

that 24 small hydro project of less than 25 MW falls under White Category and are practically non-polluting.

CAR closed.

Local Stakeholder Consultation

CAR ID	04	Date: 25/01/2021
Description of CAR		
<p>Supporting documents of local stakeholders including mechanism for ongoing communication with Local Stakeholder as per requirement of Para 3.16.3 and 3.16.4 of the VCS standard V.4.0.</p> <p>Corrective action is sought.</p>		
Project participant response		Date: 24/03/2021
<p>A Grievance Register has been placed at site to confirm ongoing communication with Local Stakeholder as per requirement of Para 3.16.3 and 3.16.4 of the VCS standard V.4.0.</p>		
Documentation provided by project participant		
Grievance Register		
DOE assessment		Date: 30/03/2021
<p>PP has provided the supporting documents of ongoing stakeholder process. PP has placed grievance/feedback register at the project site to get feedback on the project from stakeholders. The same was checked by the assessment team and confirms that there is no any grievance of stakeholders during the current monitoring period.</p> <p>CAR closed.</p>		

Accuracy of GHG Emission Reduction and Removal Calculations

CAR ID	05	Date: 25/01/2021
Description of CAR		
<p>During the review of MR and ER sheet assessment team has observed following:</p> <ol style="list-style-type: none"> 1. Electricity generation data's are missing from April 2010 to Dec 2012. PP is requested to clarify the same and provide the supporting document. 2. Electricity export to grid as per invoice for the month of Jan 2015 is missing in ER sheet 		

<p>3. Monitoring period covered up to 27th March 2016. However, data has been considered up to 01/04/2016 in ER sheet for calculation of emission reductions.</p> <p>4. Comparison of Estimated ER vs Achieved ER are not provided in MR sheet.</p> <p>Corrective action is sought.</p>	
Project participant response	Date: 24/03/2021
<ol style="list-style-type: none"> 1. Generation data from April,2010 to December,2012 have been added into ER Sheet. 2. Electricity export to grid for Jan,2015 has been added into ER Sheet. 3. Monitoring period has been corrected as per comment 4. Comparison of Estimated ER vs Achieved ER has now been provided in MR sheet. 	
Documentation provided by project participant	
<ol style="list-style-type: none"> 1. JMR 2. Invoices 3. Monitoring Report (version 02) 4. Revised ER sheet 	
DOE assessment	Date: 30/03/2021
<ol style="list-style-type: none"> 1. PP has now included the electricity export and import data from April 2010 to December 2012 and also provided the monthly JMRs and Invoices. Further, JMRs from August 2012 to February 2014 are not available with PP as plant was shut down due to floods and restoration work and therefore invoices were not raised fir this period. Verification team confirms that electricity export and import data is correct. 2. Electricity export data from invoice for the month of January 2015 is now added and also provided the copy of invoice and same is found correct. 3. PP has done apportioning of electricity export March, 2016 and now considered electricity export data upto 27th March only considered Import data for entire months which is conservative. PP has also corrected ER sheet accordingly. 4. Comparison of Estimated ER vs Achieved ER has now been provided in Section 5.4 of revised MR. The actual emission reductions achieved by the project activity is 37,068 tCO₂e which is 66.4% lower estimated emission reductions 110,431tCO₂e. <p>CAR closed.</p>	

Quality of Evidence to Determine GHG Emission Reductions and Removals

CAR ID	06	Date: 25/01/2021
Description of CAR		
<p>The details information of monitoring equipment's such as serial number of meters, calibration date dates, due date of calibration are not provided in MR.</p> <p>Further, in Section 4.3 of MR, it is mentioned that 0.5% error has been considered in the measured values for the calculation of emission reductions. Conservatively 0.5% of the electricity exported is deducted from the electricity exported and 0.5% of the electricity imported is included in the electricity imported. However, it was observed that the same is not applied in ER sheet.</p> <p>Corrective action is sought for the same.</p>		
Project participant response		Date: 24/03/2021
Calibration detail has been added in Section 4.3 in MR.		
Documentation provided by project participant		
Revised MR V02		
DOE assessment		Date: 30/03/2021
<p>PP has submitted calibration certificate of all electricity meters. Verification team found that meters are calibrated as per calibration frequency in mentioned in registered VCS PD. There is no delay in calibration of meters found.</p> <p>CAR closed.</p>		

APPENDIX 3: COMPETENCE OF TEAM MEMBERS AND TECHNICAL REVIEWERS

Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Lead Auditor/Technical Expert	OR	Das	Sukanta	TQC-Outsourced entity	Yes	Yes	Yes	Yes

Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Technical reviewer (TR)	EI	Xue	Denny	Applus+ Certification
2.	Approver	IR	Calle de Miguel	Agustín	Applus+ Certification

Short CVs of the Team:

1. **Mr. Sukanta Das** has done M. SC in Electronics and Photonics and M. Tech in Energy technology from Tezpur Central University and Indian Institute of Technology in Bombay respectively. He is a Certified Lead Auditor for ISO 14001 EMS and ISO 9001 QMS (2008 and 2015) from International Registry for Certified Auditors (IRCA) and Certified Lean Management practitioner from Quality Council of India (QCI). He has more than 12 years of working experience at TUV Nord/Re-consult/CRA and Applus+ Certification under various categories of projects and programmes starting from Renewable to waste and supercritical GHG mitigation projects. He also worked in various Carbon foot-printing projects as well. He is empanelled with Applus+ Certification since 2015 and has been involved in more than 300 Validations and

Verifications of PAs and PoAs as Lead Auditor, Technical Expert and Technical Reviewer for Renewable and non-Renewable as well as Energy Demand and Waste Management projects and programmes, and has participated in several waste management projects as Team Leader. Moreover, he also have audit experience of Warehouse Physical and Safety audits, Vendor audits among others.

2. **Mr. Denny Xue**, has a Bachelor's Degree on Thermal Energy Engineering and Master's Degree on Environmental Engineering. He has more than 10 years of experience on CDM project development. Before he joined Applus+ LGAI, he has been worked for Shanghai Chuanji Investment and Management which is a CDM consultancy company as a project manager for CDM project development. He is working with Applus+ since 2011 carrying out Validation and verification for CDM/GS/VCS project under scope 1 and 13 as auditor, lead auditor, technical expert and technical reviewer.

APPENDIX 4: ABBREVIATIONS

Abbreviations	Full texts
BM	Build Margin
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CER	Certified Emission Reduction(s)
CEA	Central Electricity Authority
CL	Clarification request
CM	Combined Margin
CMS	Central Monitoring system
CO ₂	Carbon dioxide
CO _{2e}	Carbon dioxide equivalent
DNA	Designated National Authority
DOE	Designated Operational Entity
DR	Document Review
EF	Emission Factor
EIA	Environmental Impact Assessment
ER	Emission Reductions
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming potential
HPSEB	Himachal Pradesh State Electricity Board
RBI	Reserve Bank Of India
PP	Project Participant

APPENDIX 5: CALIBRATION DETAILS

Details of Meter Calibration:

Meter	Make	Accuracy Class	Serial Number	Calibration Date	Validity	Calibrating Entity
Main Meter	Secure	0.5%	UPC00095	18/02/2008	17/02/2011	UPCL
Check Meter	L&T	0.5%	06763268	18/02/2008	17/02/2011	UPCL

Meter	Make	Accuracy Class	Serial Number	Calibration Date	Validity	Calibrating Entity
Main Meter	Secure	0.5%	UPC00095	14/02/2011	13/02/2014	UPCL
Check Meter	L&T	0.5%	06763268	14/02/2011	13/02/2014	UPCL

Meter	Make	Accuracy Class	Serial Number	Calibration Date	Validity	Calibrating Entity
Main Meter	Secure	0.5%	UPC00095	05/02/2014	04/02/2017	UPCL
Check Meter	L&T	0.5%	06763268	05/02/2014	04/02/2017	UPCL