

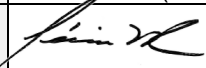


# Verification and certification report form for CDM project activities

(Version 01.0)

Complete this form in accordance with the "Attachment: Instructions for filling out the verification and certification report form for CDM project activities" at the end of this form.

## VERIFICATION AND CERTIFICATION REPORT

<b>Title of the project activity</b>	Santa Ana Hydroelectric Plant
<b>Reference number of the project activity</b>	0275
<b>Version number of the verification and certification report</b>	04.0
<b>Completion date of the verification and certification report</b>	30/08/2017
<b>Monitoring period number and duration of this monitoring period</b>	8 <sup>th</sup> monitoring period 01/08/2012–31/07/2015
<b>Version number of monitoring report to which this report applies</b>	04
<b>Crediting period of the project activity corresponding to this monitoring period</b>	Fixed, 01/08/2005 – 31/07/2015, 10 years
<b>Project participant(s)</b>	<ul style="list-style-type: none"> <li>• Empresa de Acueducto y Alcantarillado de Bogota (EAAB) – Colombia.</li> <li>• EDF Trading Limited - United Kingdom of Great Britain and Northern Ireland</li> <li>• MGM Carbon Portfolio, S.a.r.l - United Kingdom of Great Britain and Northern Ireland</li> <li>• MGM Carbon Portfolio, S.a.r.l - Switzerland</li> </ul>
<b>Host Party</b>	Colombia
<b>Sectoral scope(s), selected methodology(ies), and where applicable, selected standardized baseline(s)</b>	Sectoral Scope: 1- Energy industries (renewable - / non-renewable sources) Methodology AMS-I.D Renewable electricity generation for a grid, version 7.0
<b>Estimated GHG emission reductions or net anthropogenic GHG removals for this monitoring period in the registered PDD</b>	61,927 tCO <sub>2</sub> e
<b>Certified GHG emission reductions or net anthropogenic GHG removals for this monitoring period</b>	28,755 tCO <sub>2</sub> e
<b>Name of DOE</b>	Colombian Institute for Technical Standards and Certification (ICONTEC)
<b>Name, position and signature of the approver of the verification and certification report</b>	 Monica Vivas Head of Conformity Assessment

## SECTION A. Executive summary

ICONTEC performed the 8<sup>th</sup> periodic verification of the registered CDM project Santa Ana Hydroelectric Plant in Colombia on the basis of UNFCCC criteria contained in Article 12 of the Kyoto Protocol and CDM modalities and procedures according to the Marrakech Agreement, the criteria of the CDM Executive Board and the host country, as well as the operational and technical monitoring criteria specific to this type of project.

The proposed project activity under this verification process is based on methodology AMS-I.D: Renewable electricity generation for a grid, version 7.0. The project involves the installation of a small run-of-river hydroelectric plant, which take advantage of the water flow supply system of Bogotá. The project activity has an installed capacity of 13.43 MW. The energy produced by this project activity will be delivered to the Colombian electrical grid.

The verification process consisted of the following three phases:

- I. Desk review of the monitoring documentation, registered PDD, validation report and if apply, previous verification reports and relevant information (e.g. IPCC reports).
- II. On-site visit and follow up interviews with project stakeholders
- III. Resolution of outstanding issues and the issuance of the final verification and certification report.

The review of the monitoring documentation, registered PDD, validation report, relevant information and interviews during the on-site visit allowed ICONTEC to collect enough evidence to completely assess the verification criteria and determinate that the project has been implemented as planned and as it has been described in the registered PDD version 3.0. Emission reductions were correctly calculated based on the PDD and the monitoring equipment with an impact on the claimed emission reductions work reliably. The monitoring system is in place and has been calibrated appropriately. ICONTEC can confirm that the GHG emission reductions are calculated without material misstatements.

## SECTION B. Verification team, technical reviewer and approver

### B.1. Verification team member

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)	Involvement in			
						Desk review	On-site inspection	Interview(s)	Verification findings
1.	Team Leader and Technical Expert in Sectoral Scope 1.2	IR	Ramirez	Francy	Employee	✓	✓	✓	✓

### B.2. Technical reviewer and approver of the verification and certification report

No.	Role	Type of resource	Last name	First name	Affiliation (e.g. name of central or other office of DOE or outsourced entity)
1.	Lead technical reviewer	IR	Santos	Diana	Employee

2.	Technical Expert Reviewer in Sectoral Scope 1.2	EI	Grisales	Cristian	Freelance
3.	Approver	IR	Vivas	Monica	Employee

## SECTION C. Application of materiality

### C.1. Consideration of materiality in planning the verification

No.	Risk that could lead to material errors, omissions or misstatements	Assessment of the risk		Response to the risk in the verification plan and/or sampling plan
		Risk level	Justification	
1.	Human error in the quantification of emissions	Low	The monitoring data is exported directly from XM Web page, so there is low potential risk of errors/errors, omissions or misstatements.	To cross check 100% of electricity generation stated in Excel ER spreadsheet with the information available in XM Web page.
2.	Undue reliance on a designed information system, which may lead to Omissions and misstatements in data transfer from raw data into digital Excel ER spreadsheet	Low	Ineffective quality control of data transfer due to unclear QA/QC procedure.	Check Quality Management procedures and instructive. PP may demonstrate how to transfer data and how this is crosschecked. Conduct interview with related personnel whether procedure is actually conducted but not adequately described.
3.	Missing data due to failure of measurement equipment	Low	The monitoring plan defines emergency procedures in case a meter fails. Besides back-up meters are either installed or available onsite for fast exchange.	Check if related meters are installed as per monitoring plan. Check if emergency procedure is known across related personnel via interviews. Check back-up meters on correct calibration.

### C.2. Consideration of materiality in conducting the verification

A risk assessment was undertaken by the verification team by means of onsite physical inspection, and document review. The audit team checked the 100% of the possible material misstatements, hence, no sampling plan was required in the monitoring plan. The verification team is able to confirm that all material misstatements were properly conducted and the required corrections were performed by the PP on the version 04 of the MR.

**SECTION D. Means of verification****D.1. Desk review**

The verification of the project documentation provided by the project proponent is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the monitoring report submitted. Qualitative information comprises information on internal management controls, calculation procedures, and procedures for transfer of data, frequency of emission reports, and review and internal audit of calculations.

Main documents reviewed during the desk review stage, provided by the project proponent, are:

- Approved PDD version 3.0, dated on November 29<sup>th</sup>/2013
- Previous verification report issued by ICONTEC, dated on December/2013
- Monitoring report as submitted to UNFCCC, version 1, dated on October 12<sup>th</sup>/2016
- Emission reduction calculation file dated on October 12<sup>th</sup>/2016

In addition to the monitoring documentation provided by the project proponent, ICONTEC reviewed:

- Methodology AMS-I.D: Renewable electricity generation for a grid, version 7.0
- CDM validation & verification standard, version 09.0
- CDM project standard, version 09.0
- CDM project cycle procedure, version 09.0
- Guideline on the application of materiality in verifications, version 02.0
- Monitoring report form, version 05.1

A compilation of the documents related to the verification activities have been compiled under Appendix 3.

**D.2. On-site inspection**

Duration of on-site inspection: 24/11/2016 to 25/11/2016				
No.	Activity performed on-site	Site location	Date	Team member
1.	Description of operation of the project activity	Project activity site	24/11/2016	Francy Ramírez
2.	Status of the Project			
3.	Compliance of the project implementation with the registered project design document			
4.	Compliance of monitoring activities with the registered monitoring plan			
6.	Compliance of the monitoring report with the monitoring report form	EAAB's office	25/11/2016	
7.	Maintenance: Cross check between shutdowns, maintenance activity and MR Raw Data			
8.	Compliance with the calibration frequency requirements for measuring instruments			
9.	Assessment of data and calculation of emission reductions			
10.	Procedures for data recording and emission reductions calculation. Materiality Considerations			

## D.3. Interviews

No.	Interviewee			Date	Subject	Team member
	Last name	First name	Affiliation			
1.	Jimenez	Jose	Quality and Process Management EAAB	24/11/2016 to 25/11/2016	Description of operation of the project activity, Status of the Project, Compliance of the project implementation with the registered project design document, Compliance of monitoring activities with the registered monitoring plan, Compliance of the monitoring report with the monitoring report form, Maintenance: Cross check between shutdowns, maintenance activity and MR Raw Data, Compliance with the calibration frequency requirements for measuring instruments, Assessment of data and calculation of emission reductions, Procedures for data recording and emission reductions calculation. Materiality Considerations	Francy Ramirez
2.	Santa	Fabián	Control Centre Director EAAB			
3.	Carreño	Luis Eusebio	Hydraulic system Technician EAAB			
4.	Parra	Luis Francisco	Hydraulic system Technician EAAB			
5.	Apache	Roosvelt	Electromechanical Services Director EAAB			
6.	Sanchez	Juan Carlos	Specialized Professional - Electromechanical Services EAAB			
7.	Robles	Gloria	Contractor – Environmental sanitation EAAB			
8.	Molano	Fernando	Environmental sanitation Director EAAB			
9.	Bernal	Alberto	Specialized Professional - Maintenance Logistics EAAB			
10.	Gomez	Hernan	Specialized Professional - Electromechanical Services EAAB			
11.	Peñaloza	José	Maintenance Logistics Director EAAB			
12.	Cruz	Martha	Specialized Professional EAAB			
13.	Charry	Francisco	CDM Consultant EAAB – EBT			

**D.4. Sampling approach**

ICONTEC checked the 100% of project's information hence, no sampling approach was required.

**D.5. Clarification requests, corrective action requests and forward action requests raised**

Areas of verification findings	No. of CL	No. of CAR	No. of FAR
Compliance of the monitoring report with the monitoring report form	CL 1 CL 2 CL 3 CL 4 CL 5	-	-
Compliance of the project implementation with the registered PDD	-	-	-
Post-registration changes	-	-	-
Compliance of the monitoring plan with the monitoring methodology including applicable tool and standardized baseline	-	-	-
Compliance of monitoring activities with the registered monitoring plan	-	-	FAR 1
Compliance with the calibration frequency requirements for measuring instruments	CL 6	-	-
Assessment of data and calculation of emission reductions or net removals	-	-	-
Others (please specify)	-	-	-
<b>Total</b>	<b>6</b>	<b>-</b>	<b>1</b>

**SECTION E. Verification findings****E.1. Compliance of the monitoring report with the monitoring report form**

<b>Means of verification</b>	Monitoring report version 1 was submitted to the verification team by the project participants on 20/10/2016. ICONTEC made this report publicly available prior to the start of the verification activities. No comments were received.  During the verification, mistakes and clarifications were identified. The PP conducted the requested corrections on the latest version 04 of the MR. It can be confirmed that the monitoring report is complete, transparent and in accordance with the registered PDD, relevant CDM requirements and applicable monitoring report form. ICONTEC confirms that the MR version 04 is free of material misstatements
<b>Findings</b>	CL 1, CL 2, CL 3, CL 4, CL 5
<b>Conclusion</b>	ICONTEC verified through documental review that the latest version of the MR for the 8 <sup>th</sup> monitoring period was applied.

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

<b>Means of verification</b>	A FAR was raised in previous verification, with the aim to ask PP to develop procedures for attention of non-predicted episodes and your effective control, likewise in this previous verification it was not found evidence regarding the implementation of a quality control program with 21 procedures designed to monitor electricity generation at multiple levels, its delivery to the grid, and cross checking with the electricity purchaser and the regional distributor, in accordance with the established in the registered PDD.  In the onsite visit, the audit team verified not only the documented procedures /2/→/8/ but their implementation. Regarding the 21 procedures mentioned above, the PP argued in its response (See appendix 1 on this report) the decision of EAAB to cluster in three procedures /2/4/6/ issues like monitor electricity generation at multiple levels, its delivery to the grid, and cross checking with the electricity purchaser and the regional distributor.
<b>Findings</b>	No finding was raised on this issue
<b>Conclusion</b>	ICONTEC verified through documental review that the concerns which aim the

	audit team to raise FAR 1 were fully answered by the PP, and now PP is able to manage non-predicted episodes and your effective control according to registered monitoring plan.
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### E.3. Compliance of the project implementation with the registered project design document

Means of verification	At the time of the desk review, the audit team assessed the implementation of the project reported on MR version 01, against the one established on the registered PDD. No inconsistencies were found.													
	During the onsite visit, the implementation status and monitoring plan reported on MR version 01 were compared with the onsite evidence, physical inspection and interviews. No inconsistencies were found.													
	The status of implementation, progress and operation's starting date for each phase are shown on the next table:													
	Implementation Status													
	<table><tr><th>Phase/Site</th><th>Status of Implementation</th><th>Progress</th><th>Operation</th><th>Comments</th></tr><tr><td>Start of operation: a hydroelectric run-of river power generation project with an installed capacity of 13.43 MW</td><td>Operation Started</td><td>There was no delay in the implementation</td><td>The power plant Began delivery of electrical energy to the Colombian electrical grid on August 1<sup>st</sup>/2005</td><td>The project activity is already implemented and it is currently operating as it was described in the approved PDD.</td></tr></table>					Phase/Site	Status of Implementation	Progress	Operation	Comments	Start of operation: a hydroelectric run-of river power generation project with an installed capacity of 13.43 MW	Operation Started	There was no delay in the implementation	The power plant Began delivery of electrical energy to the Colombian electrical grid on August 1 <sup>st</sup> /2005
Phase/Site	Status of Implementation	Progress	Operation	Comments										
Start of operation: a hydroelectric run-of river power generation project with an installed capacity of 13.43 MW	Operation Started	There was no delay in the implementation	The power plant Began delivery of electrical energy to the Colombian electrical grid on August 1 <sup>st</sup> /2005	The project activity is already implemented and it is currently operating as it was described in the approved PDD.										
	The audit team verified the electricity generation data with 0 MW 1/19/ in the spreadsheet with ERs calculation /10/ with the electricity generation reported in the information service about the Colombian Wholesale Power Market operated by XM. The information provided by the PP is coherent, traceable and reliable with other information sources.													
Findings	No finding was raised regarding to this issue													
Conclusion	The audit team can confirm that: <ul style="list-style-type: none"><li>• The implementation of the project is consistent with the information provided in the registered PDD (Physical features such as technology project equipment, monitoring and metering equipment</li><li>• The project is operated as per the registered PDD.</li><li>• Information provided in the MR is in accordance with that stated in the registered PDD.</li></ul>													

### E.4. Post-registration changes

#### E.4.1. Temporary deviations from the registered monitoring plan, monitoring methodology or standardized baseline

No temporary deviations have been approved by the Board for this monitoring period or will be submitted with the request for issuance.

<sup>1</sup> The most of the events with 0 MWh corresponds to overhauls, maintenance activities (predictive or corrective)

**E.4.2. Corrections**

There are no corrections to project information or parameters fixed at validation, as was described in the registered PDD made by the project participant during the current monitoring period.

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

The project participant did not change the start date of the crediting period during the current monitoring period.

**E.4.4. Inclusion of a monitoring plan to a registered project activity**

There is no inclusion of a monitoring plan to the registered project activity during this monitoring period.

**E.4.5. Permanent changes from registered monitoring plan, monitoring methodology or standardized baseline**

There are no permanent changes from the registered monitoring plan and/or methodology identified during the current monitoring period.

**E.4.6. Changes to the project design of a registered project activity**

There are no proposed or actual changes to the project design of the registered CDM project activity reported or identified during the current monitoring period.

**E.4.7. Types of changes specific to afforestation and reforestation project activities**

This kind of changes does not apply to this project.

**E.5. Compliance of monitoring plan with the monitoring methodology including applicable tool and standardized baseline**

<b>Means of verification</b>	During the desk review phase, it was checked the monitoring plan against the monitoring methodology AMS-I.D. version 7.0 - Renewable electricity generation for a grid./UN1/  ICONTEC declares that the registered monitoring plan is in accordance with the approved methodology AMS-I.D, version 7.0 paragraph 9 and the approved PDD version 3.0 /9/
<b>Findings</b>	There is no finding regarding to this issue
<b>Conclusion</b>	According to the approved PDD /9/, the CDM project activity Santa Ana Hydroelectric Plant was monitored following the guidelines of the approved monitoring methodology AMS-I.D: Grid connected renewable electricity generation, version 7.0 paragraph 9

**E.6. Compliance of monitoring activities with the registered monitoring plan****E.6.1. Data and parameters fixed ex ante or at renewal of crediting period**

Means of verification	The monitoring parameters related to the GHG emission reductions in the project activity have been implemented in accordance with the monitoring plan contained in the approved PDD /9/.			
	The following table describes the parameters that were determined ex-ante and not monitored during the monitoring period:			
	Parameters Determined Ex-Ante in the Registered PDD			
	Parameter	Description	Value	Source
EF <sub>grid,y</sub>	CO <sub>2</sub> emission factor for electricity displaced from the grid.	0.4392 tCO <sub>2</sub> e/kWh	This value was established once at the request of	



				registration of the project activity as it was established in the registered and approved PDD /9/
<b>Findings</b>	There is no finding regarding to this issue			
<b>Conclusion</b>	ICONTEC can determine that the data sources and assumptions are appropriate and calculations are correctly used on the PDD version 3.0 and result in a conservative estimate of the emission reductions on the spreadsheet 121016 Emissions Reductions calculation_Santa Ana Hydroelectric Plant-V1.xlsx /10/.			

### E.6.2. Data and parameters monitored

Means of verification	The monitoring parameter related to the GHG emission reductions in the project activity has been implemented in accordance with the monitoring plan contained in the approved PDD /9/.			
	The following table includes the parameter monitored and describes how ICONTEC verified the fulfillment of this parameter with the registered monitoring plan, including the information flow and the values as reported in the MR.			
	Monitored Parameters			
	Monitored Parameter	Description	Value	Means of Verification
EGSA	Electricity generated, provided to the Colombia National Interconnected System.	65,485.92 kWh	<p><b>Source of Data and Frequency:</b></p> <p>Hourly transmission of the information to XM is done by EMGESA via Internet using the digital and coded mechanisms defined for all the agents of the Wholesale Power Market. The databases for recording the operations of the Colombian market are managed by XM. It is worth to mention that EMGESA does the transmission of information based on the data transmitted by the measurement systems located in Usaquen Electrical Substation.</p> <p>This substation is owned by CODENSA, the local distributor and grid operator. ICONTEC verified that the connection point of the transmission line from Santa Ana hydroelectric power plant to Usaquen electrical substation, which, in fact, is the commercial frontier registered by the project responsible in the National Dispatch Center – CND.</p> <p>For this parameter the PP used the information recorded by CND. This data is publicly available, and ICONTEC verified by documental review that the information used for this parameter and hence utilized in the emissions reduction calculation are credible and reliable.</p> <p><b>Used Equipment:</b></p> <p>Two power meters installed in the commercial frontier (Usaquen Electrical Substation). These</p>	

				<p>electrical meters have identical Ametek features<sup>2</sup>, with an accuracy of 0.2 IEC.</p> <p><b>Data Cross Checking:</b></p> <p>With the aim to verify the data provided by the PP in the spreadsheet used for emissions reductions calculations/10/, the audit team reviewed the electricity generation reported by the PP in the information service about the Colombian Wholesale Power Market operated by XM<sup>3</sup>.</p> <p>After these reviews the audit team concluded that the information provided by the PP is reliable, coherent, consistent and traceable with secondary sources of information.</p> <p><b>Consistency Between the QA/QC Defined in the Methodology:</b></p> <p>Paragraph 9 of the methodology AMS-I.D version 7.0 states that monitoring shall consist of metering the electricity generated by the renewable technology. As it was explained above this requirement is fulfilled.</p> <p><b>Consistency Between the QA/QC Established by the Project Participants in the PDD:</b></p> <p>In section B.7.1 of the approved PDD, the QA/QC is described as the execution of procedures and instructives related to: Santa Ana hydropower operation, electricity monitoring and information cross checking.</p> <p>ICONTEC could verify by means of interviews performed and documental review that that according to the monitoring plan approved in the PDD and the methodology AMS.I-D, version 7.0, the data from electricity generation from the project activity can be checked, on the other hand, this monitoring plan is in accordance with the rules established by Colombian Electrical Authorities /11/.</p> <p><b>Application of Default Values:</b></p> <p>Not applicable</p>
<b>Findings</b>	There is no finding regarding to this issue			
<b>Conclusion</b>	ICONTEC could verify the completeness and integrity of the data used by the			

<sup>2</sup> Ametek Meters:

Model: JS-09R6010-CO

Voltage: 3X69/480 V

Class: 0.2S

<sup>3</sup> <http://informacioninteligente10.xm.com.co/oferta/Paginas/HistoricoOferta.aspx?RootFolder=%2Foferta%2FHistorico%20Oferta%2FGeneraci%C3%B3n&FolderCTID=0x01200075F2CCF9F779EE4B93D2D54764CDB78A&View={9F21C71E-AD8F-4E3F-B2EA-0B38F49A9BA8}>

	<p>project proponents for the emission reductions calculations. During the verification, ICONTEC was able to verify that the parameter is properly measured according to the monitoring plan and the approved PDD, and that the information is consistent with the secondary information sources used to verify the information.</p> <p>ICONTEC can conclude that the data aggregation is appropriate to comply with the methodology and approved PDD. As a general cross check of the data, ICONTEC verified the backup system of the company and cross checked the information of the ERs spreadsheet /10/ with the backup files, which include the raw data information generated by the XM Web page<sup>2</sup> and downloaded by the PP.</p> <p>In conclusion the process of data management, transfer, storage and reporting was carried out in compliance with the monitoring plan, the approved PDD and the applied methodology/UN1/.</p> <p>ICONTEC can thus conclude that:</p> <p>The monitoring has been carried out in accordance with the monitoring plan contained in the approved PDD.</p> <p>All parameters stated in the monitoring plan of the approved PDD have been correctly and sufficiently monitored and listed. The monitored data for required parameters have been verified by ICONTEC and have been found complete, reliable and consistent.</p>
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### E.6.3. Implementation of sampling plan

<b>Means of verification</b>	The PP did not apply a sampling approach for the determination of data and parameters monitored.
<b>Findings</b>	NA
<b>Conclusion</b>	No sampling approach was applied by the PP in order to determine the monitored parameters.

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

Means of verification	The following table includes the current monitoring equipment for the parameter above mentioned and the information about equipment identification and calibration records. ICONTEC verified that the calibration covered the entire 8 <sup>th</sup> monitoring period from 01/08/2012 to 31/07/2015				
	Monitoring Equipment				
	Parameter	Equipment	Calibration Frequency	Calibration Records	Date of Calibration
	EGSA Electricity generated, provided to the Colombia National Interconnected System.	AMETEK power meter with an accuracy of 0.2 IEC	The audit team verified that neither in the approved PDD /9/ nor in the applied methodology /UN1/ there are calibration frequencies defined for electricity meters. However the PP has adopted an internal procedure which states a	Calibration Certificate N° CAM-IM-1010-020007. /17/. Dated on October 27 <sup>th</sup> /2010	27/10/2010
Serial number of Main measurement equipment: 102013561		Calibration Certificate N° CAM-IM-1211-04887. /13/. Dated on November 27/2012		20/11/2012	

			calibration frequency every 2 years /12/. The audit team deemed this frequency reliable in accordance with their knowledge about the Colombian electrical sector	Calibration Certificate N° CAM-IM-1501-016400. /15/. Dated on January 30 <sup>th</sup> /2015	27/01/2015
		AMETEK power meter with an accuracy of 0.2 IEC		Calibration Certificate N° CAM-IM-1010-020003. /17/. Dated on October 26 <sup>th</sup> /2010	26/10/2010
		Serial number of Back up measurement equipment: 102013562		Calibration Certificate N° CAM-IM-1211-04888. /14/. Dated on November 27/2012	20/11/2012
				Calibration Certificate N° CAM-IM-1501-000038. /16/. Dated on January 30 <sup>th</sup> /2015	27/01/2015
	<p>In accordance with the calibration activities executed for monitoring equipment there were delays which involves the electricity delivered since October 25<sup>th</sup>/2012 to November 19<sup>th</sup>/2012 and since November 26<sup>th</sup>/2014 to January 26<sup>th</sup>/2015.</p> <p>With the outcomes of the delayed calibration activities, the ERs calculation /10/ was adjusted in accordance with paragraph 395 (a) of the VVS /UN2/. Since the error detected is smaller than the maximum permissible error (0.2%), the maximum permissible error was applied to the measured values taken during the period between the scheduled date of calibration and the actual date of calibration.</p> <p>For values measured for Santa Ana hydroelectric power plant, the PP decided to apply the maximum permissible error for the entire months of October 2012, November 2012, November 2014, December 2014 and January 2015, as a conservative approach.</p>				
<b>Findings</b>	CL 6				
<b>Conclusion</b>	ICONTEC concluded that the detected calibration delays were penalized in accordance with the established guidelines in the latest version of VVS /UN2/ and PS /UN3/.				

## E.8. Assessment of data and calculation of emission reductions or net removals

### E.8.1. Calculation of baseline GHG emissions or baseline net GHG removals by sinks

<b>Means of verification</b>	In accordance with AMS I.D, version 7 /UN1/, the baseline is the kWh produced by project activity (Santa Ana Hydroelectric Plant) multiplied by the emission factor of the national interconnected grid of Colombia.
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	$BE_y = EGSA_y \times EF_{CM,grid,y}$ $BE_y = 65,473 \text{ kWh} \times 0.4392 \text{ kgCO}_2\text{e/kWh}$ $BE_y = 28,755 \text{ tCO}_2\text{e}$
<b>Findings</b>	No finding was raised on this issued.
<b>Conclusion</b>	ICONTEC concludes that baseline emission reductions have been correctly calculated without material misstatements.

**E.8.2. Calculation of project GHG emissions or actual net GHG removals by sinks**

<b>Means of verification</b>	In accordance to the appropriate approved baseline methodology used in this CDM project activity, emissions by sources of GHG due to the project activity are zero.
<b>Findings</b>	N/A
<b>Conclusion</b>	N/A

**E.8.3. Calculation of leakage GHG emissions**

<b>Means of verification</b>	Given that, Leakages are to be considered only when transferring existing renewable energy technology from another activity and Santa Ana Hydroelectric Plant is not transferring existing renewable energy technology from another activity, leakages are considered as zero.
<b>Findings</b>	N/A
<b>Conclusion</b>	N/A

**E.8.4. Summary of calculation of GHG emission reductions or net anthropogenic GHG removals by sinks**

<b>Means of verification</b>	In accordance with the applied methodology /UN1/ and the description provided in section E.8.1, E.8.2 and E.8.3: $ER_y = BE_y$ $ER_y = 28,755 \text{ tCO}_2\text{e}$
<b>Findings</b>	No finding was raised on this issued.
<b>Conclusion</b>	<p>The data used for determination of the emission reductions are available and have been monitored in accordance with the registered monitoring plan and methodology ACM0002 version 7.</p> <p>The data used for the calculation of ERs in this monitoring period were verified and they were found consistent with those reported in the approved PDD.</p> <p>The appropriate methods and formulae for calculating baseline emissions, project emissions and leakage were followed in accordance with the approved PDD and applied methodology.</p> <p>The assumptions, emission factors and default values applied in the MR version 04 and the calculations were correctly justified.</p>

**E.8.5. Comparison of actual GHG emission reductions or net anthropogenic GHG removals by sinks with estimates in registered PDD**

<b>Means of verification</b>	ICONTEC verified that the emission reductions achieved during the 8 <sup>th</sup> monitoring period (28,755 tCO <sub>2</sub> e) are lower than the ex-ante value (61,927 tCO <sub>2</sub> e) of emission reductions in the approved PDD.
<b>Findings</b>	No findings were raised for this section.
<b>Conclusion</b>	During on site visit, ICONTEC validated the explanations for the difference provided by the PP in the monitoring report (Section E.6) and considered them as appropriate and consistent.

**E.8.6. Remarks on difference from estimated value in registered PDD**

<b>Means of verification</b>	During the verification ICONTEC confirm that there was not increase of emission reductions compared with the emissions reductions approved on the PDD, as it was explained in Section E.8.5. above
<b>Findings</b>	No finding was raised regarding to this issue
<b>Conclusion</b>	During the verification ICONTEC confirm that there was not increase of emission

	reductions compared with the emissions reductions registered on the PDD.
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### E.8.7. Actual GHG emission reductions or net anthropogenic GHG removals by sinks during the first commitment period and the period from 1 January 2013 onwards

<b>Means of verification</b>	<p>Following the statements in the applied methodology and previously explained in section E.8.4 on this report the emissions reductions during the first commitment period are:</p> $ER_y = BE_y$ $ER_y = 5,039 \text{ kWh} \times 0.4392 \text{ kgCO}_2\text{e/kWh}$ $ER_y = 2,213 \text{ tCO}_2\text{e}$ <p>And the emissions reductions during the period from 1 January 2013 onwards are:</p> $ER_y = BE_y$ $ER_y = 60,434 \text{ kWh} \times 0.4392 \text{ kgCO}_2\text{e/kWh}$ $ER_y = 26,542 \text{ tCO}_2\text{e}$
<b>Findings</b>	No finding was raised regarding to this issue
<b>Conclusion</b>	ICONTEC deems that the current ERs have been correctly reported on the first commitment period and the period from 1 January 2013 onwards

## SECTION F. Internal quality control

This report includes the verification findings that underwent a technical review before being submitted to UNFCCC.

The technical review and the quality control process was performed by an internal technical reviewer team in accordance with the ICONTEC's internal procedures for carrying out validation, verification and certification audits of CDM project activities. After this step the submission for requesting for issuance has been conducted.

The technical reviewers are qualified in accordance with the ICONTEC's professional qualification scheme for CDM validation and verification.

## SECTION G. Verification opinion

ICONTEC was engaged by Empresa de Acueducto y Alcantarillado de Bogotá (EAAB – ESP) to verify the greenhouse gas (GHG) emission reductions reported by the CDM project Santa Ana Hydroelectric Plan, registration number 0275, owned by PP for the period 01/08/2012 to 31/07/2015, equating to 28,755 tCO<sub>2</sub>e.

The verification was performed based on the requirements set by the CDM and relevant guidance provided by CMP and the CDM Executive Board. ICONTEC considers that the project's GHG emissions and resulting GHG emissions reductions reported in the monitoring report version 04 dated on 29/08/2016, are fairly stated.

ICONTEC confirms that the project is implemented as described in the validated and registered PDD. Installed equipment essential for generating emission reductions are running reliably and calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions as a CDM project.

Empresa de Acueducto y Alcantarillado de Bogotá (EAAB – ESP) is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project's monitoring and verification plan.

Empresa de Acueducto y Alcantarillado de Bogotá (EAAB – ESP) is responsible for developing and keeping records and reporting procedures in accordance with the monitoring plan.

ICONTEC received the information and asked for explanations deemed necessary to provide enough evidence about the amount of GHG emissions and the calculation of the GHG emission reductions.

The verification consisted of the three following phases: i) desk review of the PDD, the MR and the monitoring plan ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion.

It is ICONTEC's responsibility to set an independent GHG verification opinion on the GHG emissions from the project and approved a baseline for the monitoring period.

ICONTEC utilizes a risk-based approach that draws on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate them. ICONTEC's examination process includes test-based assessments of all evidence relevant to the amounts and disclosures of a project's GHG emissions and the calculations of such reductions for the reporting period.

ICONTEC can confirm that the GHG emissions reductions are calculated without material misstatements.

ICONTEC's opinion applies to the project's GHG emissions and the resulting GHG emission reductions reported and related to the validated and registered baseline, as well as the monitoring plan and its associated documents. ICONTEC confirms the following statements:

CDM project: Santa Ana Hydroelectric Plant  
Reporting period: 01/08/2012 to 31/07/2015  
Baseline emissions: 28,755 tCO<sub>2</sub>e  
Project emissions: 0 tCO<sub>2</sub>e  
Leakage: 0 tCO<sub>2</sub>e  
Emission Reductions: 28,755 tCO<sub>2</sub>e

## **SECTION H. Certification statement**

ICONTEC has been engaged by Empresa de Acueducto y Alcantarillado de Bogotá (EAAB – ESP) to examine the greenhouse gas (GHG) emission reductions reported from Santa Ana Hydroelectric Plan for the corresponding period, equating to 28,755 tonnes of CO<sub>2</sub> equivalent.

We consider that the project's GHG emissions and resulting GHG emissions reductions reported in the Monitoring Report version 04 (29/08/2017) are fairly stated. Monitoring Report first version was publicly available on October 21<sup>st</sup>/2016.

The owner of Santa Ana Hydroelectric Plant is responsible for the preparation of the GHG emission data and the reported GHG emission reductions on the basis set out within the project's Monitoring and Verification Plan.

The owner of Santa Ana Hydroelectric Plant is responsible for developing and keeping records and reporting procedures in accordance with the Monitoring Plan.

ICONTEC is responsible to set an independent GHG verification opinion on the GHG emissions from the Project activity and approved baseline for the same period.

For this verification audit ICONTEC was provided the information and asked for explanations we deemed necessary to provide enough evidence that the amount of GHG emission and the calculation of the GHG emission reductions, based on the Monitoring Report, are fairly stated for the reporting period.

Our verification approach was based on the Kyoto Protocol requirements, Marrakech Agreement, as well as those defined by the CDM Executive Board.

ICONTEC's approach is risk-based, drawing on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate them. Our examination includes review and assessment, of the evidence related to the project's GHG emission and calculations for this reporting period.

ICONTEC is able to certify that the emission reductions from the Santa Ana Hydroelectric Plant during the 8<sup>th</sup> verification period from August 1<sup>st</sup>/2012 to July 31<sup>st</sup>/2015 equals to 28,755 tonnes of CO<sub>2</sub> equivalent.

## Appendix 1. Abbreviations

Abbreviations	Full texts
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CERs	Certified emission reductions
CL	Clarification Request
CND	Colombian National Dispatch Center (Centro Nacional de Despacho)
CO <sub>2</sub> E	Carbon dioxide equivalent
CREG	Colombian Regulatory Commission for energy and gas (Comision de Regulación de Energia y Gas)
DNA	Designated National Authority
DOE	Designated Operational Entity
EBT	Environmental Business Technology
EAAB	Bogota aqueduct and sewerage company (Empresa de Acueducto y Alcantarillado de Bogota)
ERs	Emission Reductions
GHG	Greenhouse Gases
ICONTEC	Colombian Institute of Technical Standards and Certification (Instituto Colombiano de Normas Técnicas y Certificación)
IPCC	Intergovernmental Panel on Climate Change
ISA	Electrical Interconnection (Interconexión Eléctrica S.A. E.S.P.)
MoC	Modalities of Communication
MR	Monitoring Report
PCP	CDM Project Cycle Procedure
PDD	Project Design Document
PP	Project Participant
PRC	Post Registration Change
PS	CDM Project Standard
UNFCCC	United Nations Framework Convention for Climate Change
VVS	CDM Validation and Verification Standard
XM	Abbreviation for "Market Experts". XM is a company of the ISA Group that provides integral services. <a href="http://www.xm.com.co">www.xm.com.co</a>

## Appendix 2. Competence of team members and technical reviewers

**Francy Ramírez**

**Lead auditor and Technical Expert in Sectoral Scope 1.2**

Education:

Electrical Engineer. Universidad Los Andes, 2001

Postgrade:

Assessment of Social Projects. Universidad Los Andes, 2005

Environmental Management. Universidad Los Andes, 2016

University of Oxford. Course: Applying Knowledge Management, Principle and Practices (December 1st/ 2009).

University of Oxford. Course: Successful Change Management for Engineers, Scientists and Staff in Hi-tech Companies (December 2nd 2009).



University of Oxford. Course: Essentials of Project Management for Engineers, Scientists and Staff in Hi-tech Companies (December 3rd 2009).

University of Oxford. Course: Advanced Project Management for Engineers, Scientists and Staff in Hi-tech Companies (December 4th 2009).

Climate Change, Trade and Standardization - in a development perspective". Estocolmo, Suecia (23 and 25 November 2009)

ISO global workshop on Greenhouse Gas Schemes Addressing Climate Change – How ISO Standards Help, Estocolmo, Suecia. (20 and 21 November 2009)

Conference on Climate Change – Deforestation and Standardization. Bali, Indonesia (31 May and 1st June 2010)

Professional Background:

ICONTEC (2005 - 2010)

Professional of Standardization

Planning, coordinate, implement and ensure compliance with the program of national standardization in technical committees among which are electrical installations, electrical power quality, electrical transformers, substations and equipment for medium and high voltage, lighting, appliances and electrical accessories, protection against lightning strikes and electrical equipment. Develop technical standards. Develop and manage special projects assigned. Participate in programs of regional and international standardization.

CODENSA (2002 - 2005)

Inspections and electrical works coordinator

Supervise field work and download the results in the central information system, evaluate the inspections performed, reconciled with contractors, addressing the results of inspections to different areas of the company, charging inspections and electrical work to clients of the firm, coordination and support group field sales engineers, technical training for technical staff, administrative support to department business processes and lost control, maintenance of the database for internal management inspections. Project Leader for the Optimization of Technical Processes and Regional Trade in Cundinamarca.

CDM Experience

Lead Auditor

- Validation of Guanaquitas 9.74 MW hydroelectric project, Colombia
- Validation of Fuel Switching through change of furnaces at Imusa S.A., Colombia
- Validation of Installation of a high-pressure/high-efficiency bagasse boiler to cogenerate heat and power, Argentina
- Validation of Cueva Maria Hydroelectric Expansion Project, Guatemala
- Validation of Paysandú Clean Energy, Uruguay
- Validation of La Vegona Hydroelectric project, Honduras
- Validation of Chamelecón 280 Hydroelectric project, Honduras
- Validation of Pardos SHPs and LOGICarbon CDM Project, Brazil
- Validation of Pequi and Sucupira SHPs and LOGICarbon CDM Project, Brazil
- Validation of Cambará and Embaúba SHPs and LOGICarbon CDM Project, Brazil
- Validation of Bonyic hydroelectric project, Panamá
- Validation of METALDOM Fossil fuel switch from reheat furnace, República Dominicana
- Validation of Toachi – Pilaton Hydroelectric Project, Ecuador
- Validation of EMGEA Small Hydropower (SHP) Run-of-the-River CDM Project Bundle, Colombia
- Validation of Energy efficiency at Malvinas Gas Plant, Perú
- Validation of Marañon Hydroelectric Project, Perú
- Validation of Santa Rita Hydroelectric Plant, Guatemala
- Validation of Ventana, Suba and Usaquén Hydroelectric CDM Bundled, Colombia
- Verification of Los Algarrobos hydroelectric project, Panamá
- Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-, Argentina
- Validation of Taurichuco Hydropower Project, Perú

- Validation of Aguafresca Multipurpose and Environmental Service Project, Colombia
- Verification of Agua Fresca Multipurpose and Environmental Service Project, Colombia
- Verification of La Joya Hidroelectric project, Costa Rica
- Verification of Amaime Minor Hydroelectric Power Plant, Colombia

Specialist:

- Validation of Rio Bonito and Baitaca SHPs and LOGICarbon CDM Project, Brazil
- Validation VCS of Pequi and Sucupira SHPs and LOGICarbon CDM Project, Brazil
- Verification of three crediting periods of La Vuelta and la Herradura hydroelectric project, Colombia

CDM Technical Reviewer:

- Validation of Improving energy efficiency in a new Gas Plant in Gibraltar - Colombia
- Validation of Tres Valles Cogeneration Project, Honduras
- Validation of Tunjita Diversion Hydroelectric Project, Colombia
- Validation of Ferreira Gomes Hydro Power Plant CDM Project, Brazil
- Verification of two crediting periods of La Venta II, México
- Verification of two crediting periods of La Joya Hidroelectric Project, Costa Rica
- Verification of Bio energy in General Deheza –Electric power generation from peanut hull and sunflower husk-, Argentina
- Verification of Tres Valles Cogeneration Project, Honduras
- Verification of Agua Fresca Multipurpose and Environmental Services, Colombia
- Verification of La Venta II, México
- Verification of two crediting periods of Fertinal Nitrous Oxide Abatement Project, México
- Verification of Co-composting of EFB and POME project, Guatemala
- Verification of Biogas Project, Olmeca III, Tecun Uman, Guatemala
- Verification of Jepirachi Wind Power Project, Colombia
- Verification of Biogas energy plant from palm oil mill effluent, Guatemala
- Verification of Santa Ana Hydroelectric Project, Colombia
- Validation of SHP Morro Azul CDM Project (JUN1164), Colombia
- Verification of Biogas Project, Olmeca III, Tecun Uman, Guatemala

Specialist Technical Reviewer

- Validation of Biogas project, Olmeca I, Santa Rosa, Guatemala
- Validation of CGR Catanduva Landfill Gas Project, Brazil
- Validation of Macaubas Landfill Gas Project, Brazil

**Diana Santos**

**Lead technical reviewer**

Industrial Engineer, Los Andes University, Bogotá, Colombia 2002

Post degree on Clean Production, Los Andes University, Bogotá, Colombia 2003

Master on International cooperation for development, Pavia University. Italy –  
San Buenaventura University, Cartagena, Colombia 2007

Specialization on Climate Change and Kyoto Protocol OEA 2011-ILC, Latin American Institute of Sciences, Perú, 2011

Quality Management Systems Diploma, ISO 9000, 9001, 9004 y 14001

Lead Auditor Sello Ambiental Colombiano, Sostenibilidad Turística, Auditor ISO 14001

## RELEVANTS

Calculating the Carbon Footprint. ISO Committee 207, SC 07. ISO. Oslo, Noruega Junio 2011  
 Roundtable on Verification of Afforestation / Reforestation (A/R) CDM Projects. Carbon Finance Unit - The World Bank, UNFCCC. Paris France. May 2011  
 Regional work shop ISO / BAS life cycle analysis e ISO 14040 y 14064 Nov 2010  
 Latin American and Caribbean Carbon Forum - BID2010 UNEP RISO CENTRE, Santo Domingo – Dominican Republic Oct 2010  
 CARBON MARKETS AND CLIMATE FINANCE CONFERENCE Green Power Academy and Action for Sustainable, México City, México. Sept 2010  
 Sustainable development indicators World Bank, CEPAL – United Nations, Los Andes University, Bogotá, Colombia Jul 2007

## RELEVANT WORK EXPERIENCE

2008 –Actual ICONTEC: Climate Change Professional:  
 CDM Management system support, Development of new services and innovate the current ones in order to meet the Climate Change market needs, control Support of Climate Change Product and Services.

2007 ECLAC –Economic Commission for Latin America and the Caribbean– Unit Nations Organization – UNO:  
 Formulation and management Support of the projects, participate on the link enforcement with the UNICEF initiative of public investment for children; support on the management of the project Efectos y Costos de la Desnutrición Infantil en Colombia, currently in process, made in association with the Programa Mundial de Alimentos PMA, lead by CEPAL; y also support other projects for sustainable Development and environment.

2004-2005 ODES. Organización para el Desempeño Empresarial Sostenible:  
 Professional on the development and implementation of PGIRS (Integrated Solid Waste Management) with the Tolima government and the Environmental authority.

## EXPERIENCE IN CDM ACTIVITIES:

## Lead Auditor

- Validation of La Venta II
- Verification of Santa Ana Hydroelectric Plant

## Auditor

- Validation of Estancia NINA Afforestation project
- Verification of PROCUENCA: Forestry Project to Restore the Watershed of the Chinchiná River, an Environmental and Productive Alternative for the City of Manizales and the Surrounding Region

## Technical Reviewer

- Validation of San Nicolas CDM Reforestation Project
- Validation of Providencia I: 1.8MW Small Hydro Power Generation Plant
- Validation of Providencia III: 9.11MW Small Hydro Power Generation Plant
- Verification of A joint venture project of cogeneration of electricity and hot water using natural gas and biogas produced from on-site wastewater biodigesters
- Verification of Reduction of energy consumption during the production of hydraulic lime for the construction industry through the addition of non-calcined mineral components and additives
- Verification of Fertinal Nitrous Oxide Abatement Project
- Validation of N2O Abatement at Austin Bacis Mexico Nitric Acid Plant

- Validation of Project LRT system in tunis
- Verification of Biogas energy plant from palm oil mill effluent
- Verification of Santa Ana Hydroelectric Plant
- Verification of Co-composting of EFB and POME project
- Verification of Methane recovery and effective use of power generation project Norte III-B Landfill
- Biogas Project, Olmeca III, Tecun Uman

**Cristian Grisales**  
**Lead technical reviewer**

Education:

Clean Technologies – Environmental technology, innovation and management systems as means for regional and local economic development  
 Weitz Center for Development Studies – Israel  
 June 16th - July 10th 2015

Master Executive in Renewable Energies  
 EOI-Madrid, Spain  
 February 2015

Certified ISO 14001  
 ICONTEC  
 May 2012

Certified ISO 9001  
 ICONTEC  
 August 2012

Electrical Engineer  
 National University of Colombia  
 Bogotá - Colombia  
 July 2009

Professional Background

Professional of Climate Change  
 ICONTEC

May 2012 – Today

Professional on developing validation and verification on CDM projects as lead auditor and as technical expert in the energy sector.

Electrical Maintenance Engineer  
 EMGESA S.A ESP. Colombia  
 November 2009 – May 2012

Electrical maintenance engineer in the Bogotá River Hydroelectric plants. Executing preventive, predictive and corrective maintenance of the generators, auxiliary services, power transformers and electrical substation. Developed the investment projects' inventory in accordance with the annual operating budget. Implementation of RCM maintenance programs. Monthly service availability in the plant, and full-time availability in failure care. Electrical testing of generators, transformers, motors and substation equipment.

Engineering Intern  
 INGENIERIA ESPECIALIZADA

Commercial visits to different industries, sales, design and assembly of shielding systems, grounding grids, power quality studies, calculation of electrical installations, RETIE inspections, diagnostic grounding systems, implementation, supervision and maintenance of the developed projects.

#### CDM Experience

##### Auditor and Specialist:

- Validation of Biogas project, Olmeca I, Santa Rosa, Guatemala
- Validation of CGR Catanduva Landfill Gas Project, Brazil
- Validation of Macaubas Landfill Gas Project, Brazil
- Validation of Taurichuco Hydropower Project, Perú
- Validation of Teresina Landfill Gas Project, Brazil
- Validation of Maceio Landfill Gas Project, Brazil
- Validation of Doña Teresa Hydroelectric Power Plant, Colombia
- Validation of SHPs Poço Fundo and Providência CDM Project (JUN1133), Brazil
- Validation of SHPs Tambaú, das Pedras and Rio do Sapo CDM Project (JUN1132), Brazil
- Verification of Amaime Minor Hydroelectric Power Plant, Colombia
- Verification of Ciudad Juarez Landfill Gas to Energy Project, Mexico
- Verification of Santa Ana Hydroelectric Plant, Colombia
- Verification of Biogas Project, Olmeca III, Tecún Uman, Guatemala
- Verification of Berlin Geothermal Project, Phase Two, San Salvador

##### Technical Reviewer:

- Validation of Thuan Nhen Phong Wind Farm, Viet Nam
- Validation of Phuong Mai 3 Wind Power Project, Viet Nam
- Validation of Chamelecón 280 Hydroelectric project, Honduras
- Validation of Providencia I: 1.8MW Small Hydro Power Generation Plant, Colombia
- Validation of Providencia III: 9.11MW Small Hydro Power Generation Plant, Colombia
- Validation of SHP Itaguacu CDM Project (JUN 1146), Brazil, Brazil
- Renewal of Aguafresca Multipurpose and Environmental Service Project, Colombia
- Validation of Feira de Santana Landfill Gas Project, Brazil
- Validation of SHP Morro Azul CDM Project (JUN1164), Colombia
- Verification of Santa Ana Hydroelectric Plant, Colombia
- Verification of Methane recovery and effective use of power generation project Norte III-B Landfill, Argentina

## Appendix 3. Documents reviewed or referenced

No.	Author	Title	References to the document	Provider
/1/	EAAB	Monitoring report for Monitoring period N° 8	Version 01 dated on October 10 <sup>th</sup> /2016 Version 02 dated on December 7 <sup>th</sup> /2016 Version 03 dated on July 2 <sup>nd</sup> /2017 Version 04 dated on August 29 <sup>th</sup> /2017	PP
/2/	EAAB	Procedure: MA0407P “Electric power generation”	Version 01 approved on June 28 <sup>th</sup> /2013	PP

/3/	EAAB	Instructive: MA0407I01 "Start-up and operation of small hydroelectric plant".	Version 01 approved on June 28 <sup>th</sup> /2013	PP
/4/	EAAB	Instructive: MA0407I02 "Measurement and data analyses".	Version 01 approved on June 14 <sup>th</sup> /2013	PP
/5/	EAAB	Instructive: MA0407I03 "Load rejection".	Version 01 approved on June 28 <sup>th</sup> /2013	PP
/6/	EAAB	Instructive: MA0407I04 "Reconciliation of results", and associated format: MA0407F04 "Data comparison".	Version 01 approved on June 28 <sup>th</sup> /2013	PP
/7/	EAAB	Procedure M4FM0101 "Preventive electromechanical maintenance"	Version 02 approved on October 20 <sup>th</sup> /2013	PP
/8/	EAAB	Procedure M4FM0102 "Corrective electromechanical maintenance".	Version 02 approved on October 20 <sup>th</sup> /2013	PP
/9/	EAAB	Approved Project Design Document	Version 3.0 dated on November 29 <sup>th</sup> /2013	PP
/10/	EAAB	Spreadsheet used for emissions reductions calculations	File: 290817 Emissions Reductions calculation_Santa Ana Hydroelectric Plant-V3.xlsx	PP
/11/	CREG	Resolution 038	Issued on 2014 <a href="http://www.creg.gov.co/index.php?option=com_phocadownload&amp;view=category&amp;id=178">http://www.creg.gov.co/index.php?option=com_phocadownload&amp;view=category&amp;id=178</a>	Other
/12/	EAAB	Control for measurement equipments in energy generation	Code: M4MA0417P, version 01. Dated on June 28 <sup>th</sup> /2013	PP
/13/	CAM GyM	Calibration Certificate N° CAM-IM-1211-04887 for power meter 102013561	Dated on November 27 <sup>th</sup> /2012	PP
/14/	CAM GyM	Calibration Certificate N° CAM-IM-1211-04888 for power meter 102013562	Dated on November 27 <sup>th</sup> /2012	PP
/15/	CAM GyM	Calibration Certificate N° CAM-IM-1501-016400 for power meter 102013561	Dated on January 30 <sup>th</sup> /2015	PP
/16/	CAM GyM	Calibration Certificate N° CAM-IM-1501-000038 for power meter 102013562	Dated on January 30 <sup>th</sup> /2015	PP
/17/	Compañía Americana de Multiservicios. Ltda	Calibration Certificate N° CAM-IM-1010-020007 for power meter 102013561	Dated on October 27 <sup>th</sup> /2010	PP
/18/	Compañía Americana de Multiservicios. Ltda	Calibration Certificate N° CAM-IM-1010-020003 for power meter 102013562	Dated on October 26 <sup>th</sup> /2010	PP
/19/	EAAB	Technical Report about energy generation in Santa Ana Hydroelectric Project	<ul style="list-style-type: none"> <li>• August 2012 – July 2013. Dated on February 2014</li> <li>• August 2013 – July 2014. Dated on February 2015</li> <li>• August 2014 – July 2015. Dated on February 2016</li> </ul>	PP
/UN1 /	UNFCCC	Methodology AMS-I.D: Renewable electricity generation for a grid,	<a href="http://cdm.unfccc.int/filestorage/C/D/M/CD/MWF_AM_YOTFZTED7EYGBTI7F2JS078AR9D3KM/SSC_I.D.pdf?t=bnl8b2wybzz">http://cdm.unfccc.int/filestorage/C/D/M/CD/MWF_AM_YOTFZTED7EYGBTI7F2JS078AR9D3KM/SSC_I.D.pdf?t=bnl8b2wybzz</a>	Other

		version 7.0	<a href="#">mfDBjUkkYuCRmcb2RciR3P4Tg</a>	
/UN2 /	UNFCCC	CDM validation & verification standard, version 09.0		Other
/UN3 /	UNFCCC	CDM project standard, version 09.0		Other
/UN4 /	UNFCCC	CDM project cycle procedure, version 09.0		Other
/UN5 /	UNFCCC	Guideline on the application of materiality in verifications, version 02.0		Other
/UN6 /	UNFCCC	Monitoring report form, version 05.1		Other

## Appendix 4. Clarification requests, corrective action requests and forward action requests

**Table 1. Remaining FAR from validation and/or previous verification**

FAR ID	1	Section no.	E.2	Date: 27/11/2013
<b>Description of FAR</b>				
<i>Into the quality management system are not documented the procedures for attention of non-predicted episodes and your effective control in accordance with the information reported on the registered monitoring plan.</i>				
<i>Also, in the quality management system there is not enough evidence about the implementation of a quality control program with 21 procedures designed to monitor electricity generation at multiple levels, its delivery to the grid, and cross checking with the electricity purchaser and the regional distributor, in accordance with the established in the registered PDD.</i>				
<b>Project participant response</b>				<b>Date: 09/12/2016</b>
<i>The company identified an opportunity for their management improvement by the adoption of specific procedures to control and attend the non-predicted episodes. As a result, it has been established an indicative action plan in order to attend all aspects related to energy generation activities at EAAB (including specific activities related with preventive and corrective maintenance of the power plant).</i>				
<i>The quality management system has several procedures and instructive, which provide guidance on how the company must act during the execution of activities related to supply drinking water. The company has one specific procedure related to power generation (code MA0407P) and several instructive (codes MA0407I01, MA0407I02, MA0407I03 and MA0407I04) which are applicable to the project activities; It's important to note, that previous version of the PDD had a wrong reference for 21 procedures designed to monitor energy generation, however in the last version of the registered PDD, this mistake was corrected indicating that there is only one general procedure which covers all energy generation and distribution activities.</i>				
<i>Currently, EAAB is evaluating the convenience to divide the procedure considering specific activities (perhaps more procedures) or maintain only one general document and develop more instructive. To avoid misinterpretations, the PDD validated and registered (section D.4 or section B.7.1 under VVS format) was corrected indicating that there is only one general procedure for the energy component (composed by several technical instructive) and MR has been enhanced (section B.2.2.) in order to reflect this correction of PDD. The MR and last version of the PDD are attached to this document.</i>				
<b>Documentation provided by project participant</b>				

<p>The indicative action plan and the specific procedures (for Santa Ana power plant maintenance) are attached to this document. The documents are:</p> <ul style="list-style-type: none"> <li>- 181113 Plan de acción indicativo_FAR 14 verificación MDL PCH Santa Ana,</li> <li>- M4FM0102P-02 Mantenimiento Correctivo electromecánico,</li> <li>- M4MA0407I01 01 Puesta en marcha y operación PCH,</li> <li>- M4MA0407I02 01 Medición y análisis de datos,</li> <li>- M4MA0407I03 01 Rechazo de carga de la PCH Santa Ana,</li> <li>- M4MA0407I04 01 Conciliación de resultados,</li> <li>- M4MA0407P 01_Generación de Energía,</li> <li>- M4MA0504P-01_Mantenimiento Preventivo PCH,</li> <li>- MAFM0101P-02 Mantenimiento Preventivo Electromecánico.</li> </ul>	
<b>DOE assessment</b>	<b>Date:</b> 07/02/2017
<p>The audit team reviewed the documentation delivered by the PP in order to demonstrate the procedures in the management system which has the provisions for attention of non-predicted episodes and your effective control in accordance with the information reported on the registered monitoring plan. Likewise by means of documental review, the audit team verified that in approved PDD it is mentioned only one procedure for energy generation and distribution</p>	
<p>Audit team conclusion: Closed</p>	

Table 2. CL from this verification

<b>CL ID</b>	1	<b>Section no.</b>	E.1	<b>Date:</b> 28/10/2016
<b>Description of CL</b>				
<p><i>The estimated GHG emission reductions for this monitoring report described in the first page of the monitoring report version are not in accordance with the registered PDD</i></p> <p><i>Attachment of the Monitoring report form, version 05.1, section 2, paragraph 1(k)</i></p>				
<b>Project participant response</b>				<b>Date:</b> 09/12/2016
<p>On table "Monitoring Report Form" (page 1 of the monitoring report, version 02) the value for the estimated amount of GHG emission reductions has been corrected to make it consistent with the emission reductions value established in the registered PDD (for this monitoring period).</p>				
<b>Documentation provided by project participant</b>				
<p>The Monitoring Report version 02 is attached to this document.</p>				
<b>DOE assessment</b>				<b>Date:</b> 02/02/2017
<p>In the updated version of the MR (version 02) The estimated GHG emission reductions for this monitoring report described in the first page of the monitoring report version are in accordance with the registered PDD</p>				
<p>Audit team conclusion: Closed</p>				

<b>CL ID</b>	2	<b>Section no.</b>	E.1	<b>Date:</b> 28/10/2016
<b>Description of CL</b>				
<p><i>In the monitoring report version 1 Section A.1, it is missing a brief description of the installed technology and equipment, as well as Relevant dates for the project activity</i></p> <p><i>Attachment of the Monitoring report form, version 05.1, section A.1, paragraphs 1(b) and 1 (c)</i></p>				
<b>Project participant response</b>				<b>Date:</b> 09/12/2016
<p>On section A.1 (page 2 of the monitoring report, version 02) a description of the installed technology and equipment has been included, considering the inclusion of a relevant dates.</p>				
<b>Documentation provided by project participant</b>				
<p>The Monitoring Report version 02 is attached to this document.</p>				
<b>DOE assessment</b>				<b>Date:</b> 07/02/2017
<p>In the updated version of the MR (version 02) it was included a brief description of the installed technology and equipment, as well as Relevant dates for the project activity</p>				
<p>Audit team conclusion: Closed</p>				

<b>CL ID</b>	3	<b>Section no.</b>	E.1	<b>Date:</b> 28/10/2016
<b>Description of CL</b>				



*The project participants listed in Section A.3 of the Monitoring report version 1 are not coherent with the project participants stated in the UNFCCC Website with project activity information (<https://cdm.unfccc.int/Projects/DB/TUEV-SUED1140544492.1/view>)*

*Attachment of the Monitoring report form, version 05.1, section A.3*

<b>Project participant response</b>	<b>Date:</b> 09/12/2016
<i>On section A.3 (page 2 of the monitoring report, version 02) the list of project participants has been updated in accordance with project information referred in the UNFCCC website.</i>	
<b>Documentation provided by project participant</b>	
<i>The Monitoring Report version 02 is attached to this document.</i>	
<b>DOE assessment</b>	<b>Date:</b> 07/02/2017
In the updated MR version 02, the section A.3 has listed all the project participants in accordance with the UNFCCC Website.	
However that information is not coherent with the information in the cover page of the MR version 02 (page 1)	
<b>Project participant response</b>	<b>Date:</b> 10/02/2017
<i>The cover page of the MR version 02 (page 1 of the monitoring report, version 02) has been corrected to include the list of project participants in accordance with project information referred in the UNFCCC website.</i>	
<b>Documentation provided by project participant</b>	
<i>The Monitoring Report version 02 is attached to this document.</i>	
<b>DOE assessment</b>	<b>Date:</b> 13/02/2017
In the updated version 02 of the MR it was included a complete list of project participants in the cover page	
Audit team conclusion: Closed	

<b>CL ID</b>	4	<b>Section no.</b>	E.1	<b>Date:</b> 28/10/2016
<b>Description of CL</b>				
<i>The tools to which the applied methodology (AMS-I.D version 7.0) refers are not mentioned in the monitoring report version 1 Section A.4</i>				
<i>Attachment of the Monitoring report form, version 05.1, section A.4, paragraph 1(b)</i>				
<b>Project participant response</b>				<b>Date:</b> 09/12/2016
<i>On section A.4 (page 3 of the monitoring report, version 02) has been included a reference note indicating that the applied methodology AMS-I.D version 7 does not refer to additional methodologies or tools (in addition, the preparation of the monitoring report, did not need the use of any tool. e.g. the project considered the use of an <math>EF_{grid}</math> fixed in the PDD).</i>				
<b>Documentation provided by project participant</b>				
<i>The Monitoring Report version 02 is attached to this document.</i>				
<b>DOE assessment</b>				<b>Date:</b> 07/02/2017
In the updated version of MR (version 2), Section A.4, it was clarified that the applied methodology at registration time has no reference to additional tools				
Audit team conclusion: Closed				

<b>CL ID</b>	5	<b>Section no.</b>	E.1	<b>Date:</b> 28/10/2016
<b>Description of CL</b>				
<i>A description of the installed technology and equipment is missing in the monitoring report version 1 Section B.1, as well as the information on the implementation status of the project activity during this monitoring period in accordance with the applicable provision for description of implemented registered CDM project activity in the Project standard.</i>				
<i>Attachment of the Monitoring report form, version 05.1, section B.1, paragraph 2 CDM project standard, version 09.0, Section 13.3, paragraphs 244 (a) and 244 (b)</i>				
<b>Project participant response</b>				<b>Date:</b> 09/12/2016
<i>On section B.1 (pages 5 and 6 of the monitoring report, version 02) a description of the installed technology and the status of implementation have been included according to the provisions stated in the registered PDD.</i>				
<b>Documentation provided by project participant</b>				
<i>The Monitoring Report version 02 is attached to this document.</i>				
<b>DOE assessment</b>				<b>Date:</b> 07/02/2017

In the updated version of MR (version 2) it was included in Section B.1. a description of the installed technology and equipment used in the project activity, likewise the PP wrote a description about the implementation status of the project activity during this monitoring period
Audit team conclusion: Closed

<b>CL ID</b>	6	<b>Section no.</b>	E.7	<b>Date:</b> 28/11/2016
<b>Description of CL</b>				
<i>In accordance with the records reviewed in the onsite visit a calibration activity on 2012 is missing in the description of the monitoring report section D.2</i>				
<i>VVS version 09.0 paragraph 394</i>				
<b>Project participant response</b>				<b>Date:</b> 09/12/2016
<i>On section D.2 (page 17 of the monitoring report, version 02) a reference for the calibration activities performed on 2012 were included in accordance with the records available.</i>				
<b>Documentation provided by project participant</b>				
<i>The Monitoring Report version 02 is attached to this document.</i>				
<b>DOE assessment</b>				<b>Date:</b> 07/02/2017
<i>In updated version of MR (version 02) Section D.2 the PP completed the calibration activities however it was not provided a copy of these calibration records.</i>				
<b>Project participant response</b>				<b>Date:</b> 10/02/2017
<i>Records of calibration performed on 2012 were reviewed during the on-site visit.</i>				
<b>Documentation provided by project participant</b>				
<i>Records of calibration performed on 2012 are attached to this document. The documents are:</i>				
<i>- Calibration certificate No.CAM-IM1211-048885</i>				
<i>- Calibration certificate No.CAM-IM1211-048886</i>				
<i>- Calibration certificate No.CAM-IM1211-048887</i>				
<i>- Calibration certificate No.CAM-IM1211-048888</i>				
<b>DOE assessment</b>				<b>Date:</b> 13/02/2017
<i>The calibration records were provided by the PP</i>				
Audit team conclusion: Closed				

Table 3. CAR from this verification

<b>CAR ID</b>	xx	<b>Section no.</b>		<b>Date:</b> DD/MM/YYYY
<b>Description of CAR</b>				
<i>NA</i>				
<b>Project participant response</b>				<b>Date:</b> DD/MM/YYYY
<i>NA</i>				
<b>Documentation provided by project participant</b>				
<i>NA</i>				
<b>DOE assessment</b>				<b>Date:</b> DD/MM/YYYY
<i>NA</i>				

Table 4. FAR from this verification

<b>FAR ID</b>	xx	<b>Section No.</b>		<b>Date:</b> DD/MM/YYYY
<b>Description of FAR</b>				
<i>NA</i>				
<b>Project participant response</b>				<b>Date:</b> DD/MM/YYYY
<i>NA</i>				
<b>Documentation provided by project participant</b>				
<i>NA</i>				
<b>DOE assessment</b>				<b>Date:</b> DD/MM/YYYY
<i>NA</i>				

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**Document information**

<i>Version</i>	<i>Date</i>	<i>Description</i>
01.0	23 March 2015	Initial publication.
Decision Class: Regulatory Document Type: Form Business Function: Issuance Keywords: project activities, verifying and certifying		