

VERIFICATION REPORT

CHONGQING CHENGKOU COUNTY BASHAN HYDROPOWER STATION PROJECT



Document Prepared By Bureau Veritas Certification Holding SAS

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Summary:

Bureau Veritas Certification has conducted the Pre-CDM verification of Chongqing Chengkou County Bashan Hydropower Station Project (CDM Registration Reference Number 4750), owned by Chongqing Bashan Hydropower Development Co., Ltd, which is located in Bashan town, Chengkou County, Chongqing Municipality, P.R. China, and applying the methodology ACM0002 Version 12.1.0, on the basis of Voluntary Carbon Standard (VCS) Version 3.3, as well as criteria given to provide for consistent project operations, monitoring and reporting.

The verification scope is defined as an independent and objective review and ex-post determination of the monitored GHG emission reductions, and consisted of the following three phases: i) desk review of the project design, the baseline and monitoring plan; ii) follow-up interviews with project stakeholders; iii) resolution of outstanding issues and the issuance of the final verification report and opinion. The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

In summary, Bureau Veritas Certification confirms that the project is implemented as planned and described in the validated project design documents. Installed equipments being essential for generating emission reduction run reliably and are calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reductions are calculated without material misstatements, and the emission reductions verified totalize 524,125 tons of CO₂e for the monitoring period.

Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the valid project baseline, monitoring plan and its associated documents.

Reporting period	Baseline emissions (tCO ₂ e)	Project emissions (tCO ₂ e)	Leakage emissions (tCO ₂ e)	Emission reductions (tCO ₂ e)
19/06/2009 - 31/12/2009	131,943	0	0	131,943
01/01/2010 - 31/12/2010	289,723	0	0	289,723
01/01/2011 - 30/06/2011	102,459	0	0	102,459
Total	524,125	0	0	524,125

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1 INTRODUCTION

1.1 Objective

Beijing Cronus Technology Consultancy Centre has commissioned Bureau Veritas Certification to verify the emission reductions of the Chongqing Chengkou County Bashan Hydropower Station Project (hereafter referred to as “the Project”) owned by Chongqing Bashan Hydropower Development Co., Ltd (hereafter referred to as “the PP”), which is located in Bashan town, Chengkou County, Chongqing Municipality, P.R. China for the period from 19/06/2009 to 30/06/2011, prior to its first CDM crediting period.

Bureau Veritas Certification as the validation/verification body (VVB) of the Project has been accredited as a DOE by UNFCCC and also meets the competence requirements as set out in ISO 14065:2007.

Verification of “pre-CDM” emission reductions from a project activity is the independent review and ex post determination by VVB of the monitored reductions in GHG emissions during the period from the project start date until the date when the project started its first CDM crediting period.

The objective of verification is to verify the reported voluntary emission reductions generated by the Project for the period from 19/06/2009 to 30/06/2011 and to confirm that actual monitoring systems and procedures are in compliance with that described in the monitoring plan and the additional requirements stated by the VCS Association (VCSA).

1.2 Scope and Criteria

The verification scope is defined as an independent and objective review of the VCS project description (VCS-PD), the project’s baseline study and monitoring plan, VCS monitoring report (VCS-MR) and other relevant documents. The information in these documents is reviewed against VCS version 3.3 requirements, UNFCCC rules and associated interpretations.

The verification is not meant to provide any consulting towards the client. However, stated requests for clarifications and/or corrective actions may provide input for improvement of the project monitoring towards reductions in the GHG emissions.

1.3 Level of assurance

Bureau Veritas Certification has undertaken a reasonable assurance engagement in accordance with VCS version 3.3. It requires a reasonable level of assurance in verification that GHG assertions are free of material errors, omissions and misrepresentations. The verification conclusion is based on the VCS-PD, VCS-MR, CDM-PDD, supporting evidences made available to the verifier and information collected through performing interviews and during the on-site inspection.

1.4 Summary Description of the Project

The Project is a newly built grid-connected hydropower plant with an accumulation reservoir. It involves 2 sets of hydro turbines and generators with unit capacity of 70MW, providing a total capacity of 140 MW. The annual expected electricity supplied to Central China Power Grid (CCPG) is 448,920 MWh and the annual estimated emission reductions are 382,839 tCO₂e.

The Project has been registered as a CDM project activity on 06/05/2011 (UNFCCC ref. No. 4750) under approved CDM methodology ACM0002 Version 12.1.0 "Consolidated methodology for grid-connected electricity generation from renewable sources". The first CDM crediting period started on 01/07/2011.

The Project Start Date is 19/06/2009, when the first turbine generator started electricity generation. The VCS monitoring period covers pre-CDM period from 19/06/2009 to 30/06/2011 which is prior to the CDM crediting period start date *i.e.* 06/05/2011.

<i>Project title:</i>	<i>Chongqing Chengkou County Bashan Hydropower Station Project</i>
<i>UNFCCC Ref number:</i>	<i>4750</i>
<i>CDM Registration Date:</i>	<i>06/05/2011</i>
<i>CDM 1st Crediting Period</i>	<i>01/07/2011 – 30/06/2018 (Renewable)</i>
<i>VCS Monitoring period:</i>	<i>19/06/2009 to 30/06/2011</i>
<i>Project Proponents:</i>	<i>China (host): Chongqing Bashan Hydropower Development Co., Ltd</i>
<i>Methodologies used:</i>	<i>ACM0002 Version 12.1.0</i>
<i>Location of the Project:</i>	<i>Bashan town, Chengkou County, Chongqing Municipality, P.R. China</i>
<i>Geo coordinates:</i>	<i>32°06'11"N latitude, 108°27'44"E longitude (Dam) 32°06'12"N latitude, 108°26'20"E longitude (Power house)</i>
<i>UNFCCC Link:</i>	http://cdm.unfccc.int/Projects/DB/CEC1303959894.55/view

2 VALIDATION PROCESS, FINDINGS AND CONCLUSION

2.1 Validation Process

Method and Criteria:

The overall validation, from Contract Review to Validation Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

Bureau Veritas Certification validated the project against the requirements set in VCS version 3.3, issued by VCSA on 04/10/2012 and the version 03.0 of the Clean Development Mechanism Validation and Verification Standard, issued by CDM Executive Board at its 70th meeting on 23/11/2012.

Document Review:

The VCS Project Description (VCS-PD) and the CDM Project Design Document (CDM-PDD) submitted by Beijing Cronus Technology Consultancy Centre and additional background documents related to the project design and baseline were reviewed.

Furthermore, cross checks were made between information provided in the VCS-PD, CDM-PDD and information from sources other than those used.

The validation conclusions presented in this report relate to the project as described in the VCS-PD version 03 dated 19/12/2012.

Site Inspection and Interviews:

On 17/10/2012, Bureau Veritas Certification performed a site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Chongqing Bashan Hydropower Development Co., Ltd and Beijing Cronus Technology Consultancy Centre were interviewed (see References). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
Chongqing Bashan Hydropower Development Co., Ltd (the Project Owner)	➤ Project background information. ➤ Project technology, operation and maintenance. ➤ Project approval and right of use ➤ Project implementation status. ➤ Project management and monitoring plan.
Beijing Cronus Technology Consultancy Centre (the Consultant)	➤ Applicability of selected methodology. ➤ Baseline determination. ➤ Emission reductions calculation. ➤ Emission reduction monitoring plan.

Resolution of Any Material Discrepancy:

The objective of this phase of the validation is to resolve issues that require further elaboration, research or expansion prior to Bureau Veritas Certification's positive conclusion on the project design.

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:

- (a) The project participants have made mistakes that will influence the ability of the project activity to achieve real, measurable, verifiable and additional emission reductions;
- (b) The applicable VCS requirements have not been met;
- (c) There is a risk that emission reductions cannot be monitored or calculated.

A Clarification Request (CL) is raised, if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

A Forward Action Request (FAR) may also be raised during validation, to identify issues related to project implementation that require review during the first verification of the project activity.

To guarantee the transparency of the validation process, the issues raised, the responses provided by the project participants, the means of validation of such responses and references to any resulting changes in the VCS-PD or supporting annexes are documented in the Appendix A.

2.2 Validation Findings

2.2.1 Gap Validation

According to VCS version 3.3, for projects validated under the CDM, the cover page and sections 1.2, 1.3, 1.5, 1.6, 1.7, 1.9, 1.10, 1.12.1, 1.12.2, 1.12.3, 1.12.4 and 1.13 of the VCS Project Description Template shall be completed. A validation/verification body shall undertake a validation of same, to provide a gap validation for the project's compliance with the VCS rules. The approved GHG program validation i.e. CDM validation shall be completed within the relevant validation deadline. Non-AFOLU projects shall complete validation within two years of the project start date.

The validation report that is submitted to request for CDM registration has been issued on 25/04/2011, therefore within two years of the project start date i.e. 19/06/2009.

The detailed validation process is documented in the Table below

Criteria of VCS-PD	Ref	Comments	Concl
1.2 Sectoral Scope and Project Type	VCS-PD, CDM-PDD, CDM Validation Report	As a hydro power project, the Project falls into the sectoral scope 1 Energy Industries (renewable sources). The project is not a grouped project.	OK
1.3 Project Proponent	VCS-PD, CDM-PDD, CDM Validation Report, UNFCCC website, PPA	The Project owner is Chongqing Bashan Hydropower Development Co., Ltd.	OK
1.5 Project Start Date	VCS-PD, Project commissioning report	The project start date in VCS Version 3.3 is defined as the date when the Project began generating GHG emission reduction or	OK

Criteria of VCS-PD	Ref	Comments	Concl
		removals. As per commissioning report of the Project, on 19/06/2009 the first turbine generator started electricity generation, therefore the project start date 19/06/2009 is determined appropriately.	
1.6 Project Crediting Period	VCS-PD, CDM- PDD, CDM Validation report, UNFCCC website, Project commissioning report,	The project start date is 19/06/2009 and the start date of the CDM 1st crediting period is 01/07/2011. Consequently the VCS crediting period is from 19/06/2009 to 30/06/2011.	OK
1.7 Project Scale and Estimated GHG Emission Reductions or Removals	VCS-PD, CDM-PDD, CDM Validation report	The Project is expected to achieve 382,839 tCO ₂ e of emission reductions per year. It is thus categorized as ' Large project ' as per VCS version 3.3 definition.	OK
1.9 Project Location	Site visit, VCS-PD, CDM-PDD, CDM Validation report	The project site is located in Bashan town, Chengkou County, Chongqing Municipality, P.R. China. The Project coordinates (Dam) of 32°06'11"N latitude, 108°27'44"E longitude and (Power house) of 32°06'12"N latitude, 108°26'20"E longitude have been verified during the onsite visit.	OK
1.10 Conditions Prior to Project Initiation	VCS-PD, CDM-PDD, CDM Validation report	The scenario existing prior to the start of the implementation of the project activity is the Central China Power Grid, which is dominated by fossil-fuel fired power plant, providing the same electricity service as the Project. The implementation of the Project was not to generate GHG emissions primarily for the purpose of its subsequent removal or destruction.	OK

Criteria of VCS-PD	Ref	Comments	Concl
1.12.1 Right of use	Business licence, Operation license, PPA	Business license and operation license of Chongqing Bashan Hydropower Development Co., Ltd have been provided to demonstrate the right of use of the Project. Information has also been verified by checking the Power Purchase Agreement signed between PP and the grid company.	OK
1.12.2 Emission Trading Programs and Other Binding Limits	VCS-PD	It has been verified that the project is not included in any emission trading programs or any other mechanism that includes GHG allowance trading during this monitoring period.	OK
1.12.3 Participation under Other GHG Programs	VCS-PD, CDM-PDD, CDM Validation Report, UNFCCC website	The Project has been registered as a CDM project (UNFCCC Reference No.4750) on 06/05/2011. Only GHG emission reductions achieved from the starting date of the Project to one day prior to the start date of 1 st CDM crediting period i.e. 19/06/2009 to 30/06/2011 could be verified as VCUs under the VCS program.	OK
1.12.4 Other Forms of Environmental Credit	VCS-PD	The project neither has nor intends to generate any other form of GHG-related environmental credit for GHG emission reductions claimed under the VCS Program.	OK
1.13 Additional Information Relevant to the Project	VCS-PD	N/A	OK

2.2.2 Methodology Deviations

No methodology deviation has been applied to the Project.

2.2.3 Project Description Deviations

No project description deviation has been identified during the validation. .

2.2.4 New Project Activity Instances

Not Applicable since the project is a non-grouped project.

2.3 Validation Conclusion

The review of the project design documentation and the subsequent follow-up interviews have provided Bureau Veritas Certification with sufficient evidence to determine the fulfilment of stated criteria. In our opinion, the project meets all relevant VCS version 3.3 requirements and the relevant host country criteria. Bureau Veritas Certification thus requests registration of the project as a VCS project

3 VERIFICATION PROCESS

3.1 Method and Criteria

The overall verification, from Contract Review to Verification Report & Opinion, was conducted using Bureau Veritas Certification internal procedures.

Bureau Veritas Certification verified the project against the requirements set in VCS version 3.3, issued by VCSA on 04/10/2012 and the version 03.0 of the Clean Development Mechanism Validation and Verification Standard, issued by CDM Executive Board at its 70th meeting on 23/11/2012.

3.2 Document Review

The assessment of the project documentation provided by the project participant is based upon both quantitative and qualitative information on emission reductions. Quantitative information comprises the reported numbers in the VCS monitoring report (MR) version 03 dated 07/01/2013 and emission reduction calculation spreadsheet version 03 dated 07/01/2013. Qualitative information comprises information on internal management controls, calculation procedures, procedures for transfer of data, frequency of emissions reports, and review and internal audit of calculations.

In addition to the monitoring documentation provided by the project proponents, the VVB reviews:

- (a) The VCS-PD, CDM-PDD and the monitoring plan;
- (b) The validation report
- (c) The applied monitoring methodology;
- (d) Other information and references relevant to the project activity's resulting emission reductions (e.g. IPCC reports, 3rd party measurement reports or national regulations).

3.3 Interviews

On 17/10/2012, Bureau Veritas Certification performed a site visit and interviews with project stakeholders to confirm selected information and to resolve issues identified in the document review. Representatives of Chongqing Bashan Hydropower Development Co., Ltd and Beijing Cronus Technology Consultancy Centre were interviewed (see References). The main topics of the interviews are summarized in Table 2.

Table 2 Interview topics

Interviewed organization	Interview topics
Chongqing Bashan Hydropower Development Co., Ltd (the Project Owner)	➤ Project Design and implementation ➤ Technical equipment, calibration and operation ➤ Monitoring Plan and management procedures ➤ Monitoring data ➤ Data uncertainty and residual risks (QA/QC) ➤ Environmental Impacts ➤ Compliance with National Laws and Regulations
Beijing Cronus Technology Consultancy Centre (the Consultant)	➤ Monitoring Plan ➤ Monitored data and Monitoring Report ➤ GHG Calculations

3.4 Site Inspections

Please refer to section 3.3 above.

3.5 Resolution of Any Material Discrepancy

The objective of this phase of the verification is to resolve issues related to the monitoring, implementation and operations of the registered project activity that could impair the capacity of the registered project activity to achieve emission reductions or influence the monitoring and reporting of emission reductions prior to Bureau Veritas Certification's positive conclusion on the GHG emission reduction calculation.

Findings established during the verification can either be seen as a non-fulfilment of criteria ensuring the proper implementation of a project or where a risk to deliver high quality emission reductions is identified.

A Corrective Action Request (CAR) is raised, if one of the following situations occurs:

- (a) Non-compliance with the monitoring plan or methodology are found in monitoring and reporting and has not been sufficiently documented by the project participants, or if the evidence provided to prove conformity is insufficient;
- (b) Modifications to the implementation, operation and monitoring of the registered project activity has not been sufficiently documented by the project participants;

(c) Mistakes have been made in applying assumptions, data or calculations of emission reductions that will impact the quantity of emission reductions;

(d) Issues identified in a FAR during validation to be verified during verification or previous verification(s) have not been resolved by the project participants.

A Clarification Request (CL) is raised, if information is insufficient or not clear enough to determine whether the applicable VCS requirements have been met.

A Forward Action Request (FAR) is raised, for actions if the monitoring and reporting require attention and/or adjustment for the next verification period.

To guarantee the transparency of the verification process, the concerns raised are documented in more detail in Appendix A.

4 VERIFICATION FINDINGS

4.1 Project Implementation Status

Bureau Veritas Certification has performed a site visit and found that the Project has been put into operation and the electricity generated is supplied to CCPG according to the signed Power Purchase Agreement (PPA). 2 sets of hydro turbines (model: HLA855-LJ-255) and generators (Model: SF70-18/5700) with unit capacity of 70MW, providing a total capacity of 140 MW have been in operation during the monitoring period.

No changes to the project design have been identified during this verification. The implementation and operation of the project activity have been conducted in accordance with the description contained in the registered PDD.

According to the construction completion report, the Project finished the construction of the 1st set of turbine and generator on 02/06/2009 and the 2nd set on 28/07/2009. As per the commissioning report of the Project, the Project started commissioning on 19/06/2009, and was put into full operation on 10/08/2009.

[Power System]

As shown in the diagram of the power connection system, the electricity generated by the Project is delivered to the 10 kV main line, after stepped up to 220 kV it delivered to grid substation and finally to CCPG. The electricity supplied by the grid is imported from the 10 kV main line at normal condition and from a 10 kV back-up line in case of need.

[Metering System]

There are two meters installed for the Project.

Meter M1 was installed at the 10 kV main line to measure the electricity exported to and imported from the grid by the Project.

Meter M2 was installed at the 10 kV back-up line to measure the electricity imported from the grid by the Project in case of need.

The backup line and meter M2 were installed and put into use since 01/05/2010. A statement issued by the grid company regarding the use of backup line and meter M2 has been verified by the verification team.

The meter M1 was replaced on 22/05/2011 by the new meter. The meter replacement record issued by the grid company has been provided by the PP and verified by the verification team.

4.2 Accuracy of GHG Emission Reduction or Removal Calculations

Monitoring has been carried out in accordance with the monitoring plan contained in the registered PDD.

[Parameters and information flow]

The parameters required by the monitoring plan and how Bureau Veritas Certification has verified the information flow (from data generation, aggregation, to recording, calculation and reporting) for these parameters including the values in the monitoring report are described below:

Parameters monitored:

- (1) $EG_{\text{facility},y}$, net electricity supplied by the project to the grid

The net electricity supplied to the grid by the Project is the electricity exported to the grid (ES_y) which is measured by the bidirectional meter M1 minus the electricity imported from the grid (ED_y) which is measured by the bidirectional meter M1 and unidirectional M2. Therefore $EG_{\text{facility},y}$ can be calculated as below:

$$EG_{\text{facility},y} = ES_y - ED_y$$

As described above, the meters have been installed in accordance with the registered PDD. The verification team has checked on-site the location of the meters against the diagram of power connection system and found them to be consistent.

The readings of the meters are continuously monitored and monthly recorded by the PP and the grid company. 24:00 o'clock on the last day of each month is the cut-off time to calculate the monthly exported electricity to the grid by the Project. 24:00 o'clock on the 24th of each month is the cut-off time to calculate the monthly imported electricity from the grid by the Project via meter M1. 24:00 o'clock on the 6th of each month is the cut-off time to calculate the monthly imported electricity from the grid by the Project via meter M2. In addition, the electricity export and import data are also recorded at 24:00PM of 31st Dec of each year, the beginning of the project start date and on 24:00PM of 30th Jun 2011. The grid company provided the PP monthly with the Electricity Transaction Notes (ETNs) which contain the electricity exported to the grid by the Project and the electricity imported from the grid by the Project. After a cross-check with its own Monthly Reading Records (MRR), the project owner archived the copy of these statements and receipts.

The verification team has verified the values provided in the monitoring report and ER spreadsheet against the relevant documented evidences i.e. the MRRs and the ETNs and found them to be consistent with the evidences. The MRRs and the ETNs can cover this monitoring period from 19/06/2009 to 30/06/2011.

(2) Cap_{PJ}, installed capacity of the hydro power plant after the implementation of the project activity

The installed capacity of the project activity is determined according to installed equipments' nameplates and is monitored annually. As per the nameplates of the on-site turbines and generators, the installed capacity of the hydropower plant after the implementation of the project activity is 140MW.

(3) A_{PJ}, area of the reservoir after the implementation of the project activity

The value of A_{PJ} is equal to area of the reservoir measured in the surface of the water, after the implementation of the project activity, when the reservoir is full. It has been measured annually by a qualified third party Chongqing Survey and Design Institute of Water Resource, Electric Power and Architecture. The verification team has verified the measurement reports and the qualification of the measurement entity. The measurement has been conducted in Nov 2009 and Nov 2010. Both measurements indicated a result of 5,720,000 m².

Parameters determined ex-ante:

(1) EF_y, emission factor of the grid

The emission factor of the 1st crediting period of the Project has been determined ex-ante in the registered PDD. The emission factor used in the monitoring report has been verified against the PDD and found them to be consistent.

(2) Cap_{BL}, installed capacity of the hydro power plant before the implementation of the project activity

For new hydropower plants the value is zero. The value used in the monitoring report has been verified against the PDD and found them to be consistent.

(3) A_{BL}, area of the reservoir before the implementation of the project activity

The value of A_{BL} is equal to area of the reservoir measured in the surface of the water, before the implementation of the project activity, when the reservoir is full. For new reservoirs, this value is zero. The value used in the monitoring report has been verified against the PDD and found them to be consistent.

[Calibration]

The registered monitoring plan requires that all the meters have accuracy of 0.5 and calibrated annually.

During this monitoring period, the installed measuring instruments have been operating well and were duly calibrated. The calibration records are shown in Table 3 below.

Table 3 The calibration records of the meters

Meter ID	Serial number	Accuracy	Calibration date	Operation period in this MP	Validity	Calibration entity
M1 (new)	20071213020381	0.5S	10/04/2009 12/03/2010 20/02/2011	19/06/2009 ~ 22/05/2011	Yes	A
M1 (old)	1208000041	0.5S	20/02/2011	22/05/2011 ~ 30/06/2011	Yes	A
M2	6090008905	0.5S	12/03/2010 20/02/2011	01/05/2010 ~ 30/06/2011	Yes	A

Entity A: Metrology and Quality Inspection Center Wanzhou in Chongqing (Yu) Fa Ji (2006) No.001 and (Yu) Fa Ji (2009) No.001

The verification team has verified the calibration records and the accreditation certificates of the calibration entity. All the meters meet the rated accuracy level as described in the monitoring plan and are in compliance with the industry standard *Technical Administrative Code of Electric Energy Metering (DL/T 448-2000)*.

The calibration frequency fulfills the requirement as described in the monitoring plan and is in compliance with the national standard *Verification Regulation of Electrical Energy Meter with Electronics (JJG 596-1999)*.

[Assessment data and calculation]

A complete set of data for the specified monitoring period is available.

The critical parameter used for the determination of the Emission Reductions is the net electricity supplied to the grid by the Project. The data pertaining to the above parameter are maintained in the identified records. All the data are in compliance with that stated in the Monitoring Report version 03.

As per the methodology ACM0002 Version 12.1.0 and the registered PDD, the emission reductions for the Project are calculated as the baseline emissions minus the project emissions. Hence the emission reduction is determined by the following formula:

$$ER_y = BE_y - PE_y$$

Where,

ER_y : Emission reductions

BE_y : Baseline emissions

PE_y : Project emissions

[Baseline emissions]

The baseline emissions are the baseline emission factor times the net electricity supplied to the grid. Therefore,

$$BE_y = EF_y * EG_{\text{facility},y}$$

EF_y : GHG emission factor of the CCPG, calculated ex-ante in the registered PDD as 0.85280 tCO₂e/MWh

$EG_{\text{facility},y}$: Net electricity supplied to the grid

The net electricity delivered to the grid ($EG_{\text{facility},y}$) can be calculated as:

$$EG_{\text{facility},y} = ES_y - ED_y$$

The verification team has cross-checked the values from the MRRs with the ETNs for the period from 19/06/2009 to 30/06/2011. The conservative values are used for emission reductions calculation. The verified values are shown in the following Table 4, 5 and 6.

Table 4 The verified electricity exported to the grid by the Project via M1 (MWh)

Period	MRRs	ETNs	Verified ES_y
19/06/2009-30/06/2009	14545.65	108486.840	108486.840
01/07/2009-31/07/2009	43927.80		
01/08/2009-31/08/2009	50051.40		
01/09/2009-30/09/2009	32763.15	32728.080	32728.080
01/10/2009-31/10/2009	12737.55	12720.840	12720.840
01/11/2009-30/11/2009	479.85	475.220	475.220
01/12/2009-31/12/2009	507.15	504.220	504.220
Subtotal	-	-	154915.200
01/01/2010-31/01/2010	15063.30	15051.960	15051.960
01/02/2010-28/02/2010	3657.15	3651.120	3651.120
01/03/2010-31/03/2010	5234.25	5229.840	5229.840
01/04/2010-30/04/2010	37881.90	37845.720	37845.720
01/05/2010-31/05/2010	38758.65	38715.600	38715.600
01/06/2010-30/06/2010	31327.80	31301.160	31301.160
01/07/2010-31/07/2010	50353.80	50332.920	50332.920
01/08/2010-31/08/2010	67655.70	67573.440	67573.440
01/09/2010-30/09/2010	78157.80	78067.440	78067.440
01/10/2010-31/10/2010	2275.35	2273.040	2273.040
01/11/2010-30/11/2010	3655.05	3643.200	3643.200
01/12/2010-31/12/2010	6880.65	6873.240	6873.240

Subtotal	-	-	340558.680
01/01/2011-31/01/2011	12295.50	12261.780	12261.780
01/02/2011-28/02/2011	11000.85	10967.895	10967.895
01/03/2011-31/03/2011	26295.15	26262.135	26262.135
01/04/2011-30/04/2011	22097.25	22064.400	22064.400
01/05/2011-31/05/2011	13564.95	13564.875	13564.875
01/06/2011-30/06/2011	35473.20	35439.675	35439.675
Subtotal	-	-	120560.760
Total	-	-	616035.640

Table 5 The verified electricity imported from the grid by the Project via M1 (MWh)

Period	MRRs	ETNs	Verified ED _y (via M1)
19/06/2009-24/06/2009	2.10	29.40	29.40
25/06/2009-24/07/2009	6.30		
25/07/2009-24/08/2009	21.00		
25/08/2009-24/09/2009	22.05	22.05	22.05
25/09/2009-24/10/2009	34.65	34.65	34.65
25/10/2009-24/11/2009	31.50	31.50	31.50
25/11/2009-31/12/2009	79.80	79.80	79.80
Subtotal	-	-	197.40
01/01/2010-24/01/2010	56.70	56.70	56.70
25/01/2010-24/02/2010	70.35	70.35	70.35
25/02/2010-24/03/2010	86.10	86.10	86.10
25/03/2010-24/04/2010	23.10	23.10	23.10
25/04/2010-24/05/2010	45.15	45.15	45.15
25/05/2010-24/06/2010	54.60	54.60	54.60
25/06/2010-24/07/2010	24.15	24.15	24.15
25/07/2010-24/08/2010	16.80	16.80	16.80
25/08/2010-24/09/2010	29.40	29.40	29.40
25/09/2010-24/10/2010	84.00	84.00	84.00
25/10/2010-24/11/2010	49.35	49.35	49.35
25/11/2010-31/12/2010	65.10	65.10	65.10
Subtotal	-	-	604.80
01/01/2011-24/01/2011	58.80	58.80	58.80
25/01/2011-24/02/2011	58.80	58.80	58.80
25/02/2011-24/03/2011	23.10	23.10	23.10
25/03/2011-24/04/2011	37.80	37.80	37.80

25/04/2011-24/05/2011	34.65	34.65	34.65
25/05/2011-30/06/2011	30.45	30.45	30.45
Subtotal	-	-	243.60
Total	-	-	1045.80

Table 6 The verified electricity imported from the grid by the Project via M2 (MWh)

Period	MRRs	ETNs	Verified ED _y (via M2)
19/06/2009-31/12/2009	0.00	0.00	0.00
Subtotal	-	-	0.00
01/01/2010-30/04/2010	0.00	0.00	0.00
01/05/2010 ¹ -06/06/2010	23.98	23.98	23.98
07/06/2010-06/07/2010	21.66	21.66	21.66
07/07/2010-06/08/2010	25.76	25.76	25.76
07/08/2010-06/09/2010	28.84	28.84	28.84
07/09/2010-06/10/2010	18.66	18.66	18.66
07/10/2010-06/11/2010	20.34	20.34	20.34
07/11/2010-06/12/2010	34.40	34.40	34.40
07/12/2010-31/12/2010	48.64	48.64	48.64
Subtotal	-	-	222.28
01/01/2011-06/02/2011	44.26	44.26	44.26
07/02/2011-06/03/2011	44.16	44.16	44.16
07/03/2011-06/04/2011	30.56	30.56	30.56
07/04/2011-06/05/2011	24.06	24.06	24.06
07/05/2011-06/06/2011	15.84	15.84	15.84
07/06/2011-30/06/2011	13.52	13.52	13.52
Subtotal	-	-	172.40
Total	-	-	394.68

Vintage 2009: $EG_{\text{facility},y} = ES_y - ED_y = 154915.200 - 197.40 - 0.00 = 154718 \text{ MWh}$

Vintage 2010: $EG_{\text{facility},y} = ES_y - ED_y = 340558.680 - 604.80 - 222.28 = 339732 \text{ MWh}$

Vintage 2011: $EG_{\text{facility},y} = ES_y - ED_y = 120560.760 - 243.60 - 172.40 = 120145 \text{ MWh}$

Total: $EG_{\text{facility},y} = ES_y - ED_y = 616035.640 - 1045.80 - 394.68 = 614,594 \text{ MWh}$

¹ The back-up line and meter M2 were put into use since 1 May 2010.

Table 7 The baseline emissions of the Project

Period	EG _{facility,y} (MWh)	EF _y (tCO ₂ e/MWh)	BE _y (tCO ₂ e)
-	A	B	C=A*B
19/06/2009 - 31/12/2009	154718	0.85280	131,943
01/01/2010 - 31/12/2010	339732		289,723
01/01/2011 - 30/06/2011	120145		102,459
Total	614,594	-	524,125

[Project emissions]

A_{PJ} of the project is 5,720,000 m², Installed capacity of the project is 140,000,000 W, the power density of the project is calculated as:

$$(Cap_{PJ} - Cap_{BL}) / (A_{PJ} - A_{BL}) = (140,000,000 - 0) / (5,720,000 - 0) = 24.5 \text{ W/m}^2, \text{ greater than } 10 \text{ W/m}^2.$$

As per the methodology ACM0002 Version 12.1.0, the project emissions are zero.

[Leakage emissions]

No leakage needs to be considered according to ACM0002 Version 12.1.0.

[Emission reductions]

The emission reductions during the monitoring period from 19/06/2009 to 30/06/2011 are calculated as follows:

Table 8 The emission reductions of the Project

Period	Vintage	BE _y (tCO ₂ e)	PE _y (tCO ₂ e)	ER _y (tCO ₂ e)
-	-	C	D	E=D-C
19/06/2009 to 30/06/2011	2009	131,943	0	131,943
	2010	289,723	0	289,723
	2011	102,459	0	102,459
	Total	524,125	0	524,125

[Comparison of ERs]

The annual estimated emission reductions are 382,839 tCO₂e as per the registered PDD. The actual operation days of the Project in the monitoring period are 742 days. The corresponding estimate in the monitoring period are 778,264 (=382,839*742/365) tCO₂e. The actual emission reductions are lower than the estimated value in the monitoring period and it is deemed to be reasonable.

4.3 Quality of Evidence to Determine GHG Emission Reductions or Removals

All necessary documentation is collected, referenced and is easily accessible in hard-copy or electronic format. The data pertaining to the monitored parameters are maintained in the identified internal records and consistent with the values stated in the Monitoring Report version 03. Key data have been cross-checked via external sources, such as ETNs.

4.4 Management and Operational System

The PP has operated the Project as per the VCS-PD and the registered CDM-PDD. The monitoring organization has been set up and all monitoring staffs have been trained. Monitoring & Management Manual and internal training records have been provided and verified by the verification team.

The verification team confirms that the quality management system for the Project is in place. The documented instructions including the responsibilities have been properly implemented and in line with the registered PDD. Internal review being a regular practice ensures the quality assurance of the monitoring procedures. The management of PP is responsible for data protection exclusively with access restrictions.

5 VERIFICATION CONCLUSION

Bureau Veritas Certification has performed the pre-CDM verification of Chongqing Chengkou County Bashan Hydropower Station Project (CDM Registration Reference Number 4750), which is located in Bashan town, Chengkou County, Chongqing Municipality, P.R. China, and applying the methodology ACM0002 Version 12.1.0. The verification was performed based on the requirements set by Voluntary Carbon Standard (VCS) Version 3.3, as well as criteria given to provide for consistent project operations, monitoring and reporting.

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

The management of Chongqing Bashan Hydropower Development Co., Ltd is responsible for the preparation of the GHG emissions data and the reported GHG emission reductions of the project on the basis set out within the monitoring plan contained in the registered PDD. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification has verified the project Monitoring Report version 03 dated 07/01/2013 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as described in the validated and registered project design documents. Installed equipments being essential for generating emission reductions run reliably and are calibrated appropriately. The monitoring system is in place and the Project is generating GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reductions are calculated without material misstatements. Our opinion relates to the projects' GHG emissions and resulting GHG emission reductions reported and related to the validated and registered project baseline, monitoring plan and its associated documents. Based on the evidence and information that are considered necessary to guarantee that GHG emission reductions are appropriately calculated, Bureau Veritas Certification confirms the following statement:

Reporting period: From 19/06/2009 to 30/06/2011

GHG Emission Reductions	2009	2010	2011	Total
Baseline Emissions (tCO ₂ e)	131,943	289,723	102,459	524,125
Project Emissions (tCO ₂ e)	0	0	0	0
Leakage (tCO ₂ e)	0	0	0	0
Net GHG emission reductions (tCO₂e)	131,943	289,723	102,459	524,125

6 REFERENCE

Documents reviewed:

- /1/ VCS-PD version 02 dated 17/09/2012
- /2/ VCS-PD version 03 dated 19/12/2012
- /3/ Registered PDD version 6.0 dated 15/04/2011, UNFCCC ref no.4750
- /4/ Validation Report revision 02, dated 25/04/2011
- /5/ Monitoring Report version 02, dated 17/09/2012
- /6/ Monitoring Report version 03, dated 07/01/2013
- /7/ ER Calculation Spreadsheet version 03, dated 07/01/2013
- /8/ ACM0002 Version 12.1.0 dated 26/11/2010
- /9/ Validation and Verification Standard Version 03.0 dated 23/11/2012
- /10/ VCS Standard version 3.3 dated 04/10/2012
- /11/ Technical Administrative Code of Electric Energy Metering (DL/T 448-2000)
- /12/ Verification Regulation of Electrical Energy Meter with Electronics (JJG 596-1999)
- /13/ Operation license of the project proponent
- /14/ Business license of the project proponent
- /15/ Diagram of power connection system of the Project
- /16/ Nameplates of the turbines and generators
- /17/ Signed Power Purchase Agreement (PPA) dated 01/05/2009, 01/01/2010 and 31/12/2010
- /18/ Construction completion reports of the Project dated 02/06/2009 and 28/07/2009
- /19/ Commissioning report of the Project
- /20/ Implementation log of the Project
- /21/ Monthly Reading Records of the Project
- /22/ Electricity Transaction Notes (ETNs) issued by the Grid Company
- /23/ Meters replacement record of the Project issued by the Grid Company
- /24/ Statement on start using of back-up line and meter M2
- /25/ Calibration Records/Certificates
- /26/ Certificates of metrological authorization to Metrology and Quality Inspection Center Wanzhou in Chongqing (Yu) Fa Ji (2006) No.001 with the valid period from 26/12/2006 to 25/12/2009 and (Yu) Fa Ji (2009) No.001 with the valid period from 22/09/2009 to 21/09/2014
- /27/ Reservoir surface area measurement reports issued by Chongqing Survey and Design Institute of Water Resource, Electric Power and Architecture dated 01/11/2009 and 01/11/2010
- /28/ Survey Qualification certificate of Chongqing Survey and Design Institute of Water Resource, Electric Power and Architecture [Yi Ce Zi No.5001077], valid from 06/03/2005 to 05/03/2010 and from 03/03/2010 to 02/03/2015
- /29/ Monitoring & Management Manual
- /30/ Internal Training Records and Qualification Certificate of Operation Staff

Persons interviewed:

Chongqing Bashan Hydropower Development Co., Ltd

/1/	TAN Lei	Chief Executive and General Manager
/2/	WAN Youyong	Deputy Director
/3/	SUN Weifeng	Engineer
/4/	WU Lihong	Deputy Director
/5/	ZHENG dacheng	Deputy General Manager
/6/	WEN Liang	Project Manager
Beijing Cronus Technology Consultancy Centre		
/7/	YANG Yi	Director

7 CURRICULUM VITAE OF THE VERIFICATION TEAM MEMBER

Mr. Peter Huang Qin	Bureau Veritas Certification, China	Team Leader, Climate Change Lead Verifier, He holds a Master Degree in Industrial Ecology. Before joining BV in Jan 2010, he gained almost two years of CDM audit experience and two years of technical experience in power industry. He obtained the certificate of GHG Auditor, Lead Auditor for EMS ISO 14001 and has successfully completed the course assessment for ISO 14064:2006.
Ms. Zhang Chen	Bureau Veritas Certification, China	Technical Reviewer, Climate Change Lead Verifier. She holds Master Degree in Environmental Economics and Environmental Engineering. Before joining BV in 2010, she has gained various experiences in project financing evaluation, policy cost-benefit analysis and environmental management. She is a member of Sino-Franco Urban Sustainable Development Association. She obtained the certificate of ISO 14064.



Ms. Zhang Chen

Internal Technical Reviewer

31 Jan 2013



Mr. Peter Huang Qin

Team Leader

31 Jan 2013

APPENDIX A: RESOLUTION OF CORRECTIVE ACTION /CLARIFICATION / FORWARD ACTION REQUESTS

Draft report clarifications and corrective action requests by verification team	Summary of project participant response	Verification team conclusion
CAR 1 Latest version of PD template has not been used.	The latest version of PD template is used in the revised version.	The latest version of PD template has been used in the revised PD. Hence this CAR is closed.
CAR 2 The project start date and the start date of crediting period have not been correctly indicated in the PD and MR.	The project start date and the start date of crediting period in the PD and MR is corrected.	The project start date and the start date of crediting period in the revised PD and MR have been corrected and are in compliance with the VCS requirement. Hence this CAR is closed.
CAR 3 The estimated GHG emission reductions and total number of crediting years have not been correctly indicated and thus the project scale has not been appropriately identified in the PD section 1.7.	The estimated GHG emission reductions and total number of crediting years are corrected and the project scale is also corrected in the PD section 1.7.	The estimated GHG emission reductions and total number of crediting years have been corrected and the project scale has been appropriately identified as Large project in the revised PD. Hence this CAR is closed.
CAR 4 Information provided in PD section 1.12.2, 1.12.3 and 1.12.4 are not fully in compliance with the VCS Standard version 3.3. e.g. CDM has been mentioned in section 1.12.2 and 1.12.4 which is not relevant. CDM registration number has not been provided in section 1.12.3.	The information in PD section 1.12.2, 1.12.3 and 1.12.4 are revised to be compliance with VSC standard version 3.3.	Information provided in revised PD section 1.12.2, 1.12.3 and 1.12.4 has been checked and found to be in compliance with VCS version 3.3. Hence this CAR is closed.
CAR 5 Ex ante Parameter “CAP _{BL} and A _{BL} ” has not been reported in the MR.	CAP _{BL} and A _{BL} are added in MR	The parameter “CAP _{BL} and A _{BL} ” has been reported in the revised MR. Hence this CAR is closed.
CAR 6 The serial number of meter M1 indicated in the MR (00000345) is not consistent with the one in the calibration report and meter replacement	Serial number of M1 is revised in the MR.	The Serial number of M1 has been revised and checked to be consistent

Draft report clarifications and corrective action requests by verification team	Summary of project participant response	Verification team conclusion
records (20071213020381).		with the relevant evidence. Hence this CAR is closed.
CAR 7 The position of meter M1 indicated in the line diagram of the MR is not consistent with the description in the PDD and PPA.	PP's 1st response: Position of M1 is revised. DOE's follow-up request: The position of M1 is still not correct as the PPA states that the monitoring point is at 10kV line of the on-site substation. PP's 2nd response: The M1 is changed to be at the 10kV line.	The line diagram in section 3.3 of the MR has been revised and checked to be consistent with the description in the PDD and PPA. Hence this CAR is closed.
CL 1 Please provide license of operation as evidence of right of use.	The license of operation is provided	The license of operation has been provided and checked to be valid as evidence of right of use. Hence this CL is closed.
CL 2 Please specify the technical specifications of the main equipment in section 2.1 of the MR.	The specifications of the main equipment in section 2.1 of the MR is added.	The technical specifications of the main equipment have been specified in the revised MR. Hence this CL is closed.
CL 3 Please indicate construction completion date and the commissioning date of each turbine in section 2.1 of the MR.	The completion date and commissioning date of each turbine is added in section 2.1 of the MR.	The construction completion date and the commissioning date of each turbine have been provided in the revised MR and checked to be consistent with relevant evidence. Hence this CL is closed.
CL 4 Please specify in section 2.1 of the MR which meter was replaced during the monitoring period and also explain why back-up line meter was not in place before May 2010, relevant	PP's 1st response: In section 2.1 of the MR, the replaced meter is added. The back-up line was put in use since May	Meter replacement and the implementation status of the back-up line have been further specified in

Draft report clarifications and corrective action requests by verification team	Summary of project participant response	Verification team conclusion
evidence shall be provided.	2010, so the back-up line meter was not in place before May 2010. The explanation is added in page 6 section 3.2 of the MR and the relevant evidence is attached. DOE's follow-up request: Please add the implementation status of the back-up line in section 2.1 of the MR as well. PP's 2nd response: The back-up line information is added in section 2.1 of the MR.	section 2.1 of the revised MR. Hence this CL is closed.
CL 5 Please correctly specify the source of data, measurement methods and procedures for all the monitored parameters.	The source of data, measurement methods and procedures for all the monitored parameters are added in the MR.	The measurement methods and procedures for all the monitored parameters have been specified in the revised MR. Hence this CL is closed.
CL 6 Please provide complete calibration information of the backup line meter M2 in the MR and submit relevant evidence to DOE.	The calibration information of backup line meter M2 is added in MR and the evidence is provided.	Calibration information of the backup line meter has been provided in the revised MR and checked to be consistent with the evidence. Hence this CL is closed.
CL 7 Please list all monitored data as per the prescribed recording frequency in the MR or provide a reference to other supplementary documents e.g. spreadsheet.	The reference to the spreadsheet is added. The description of "Value monitored" for A_{PJ} was revised in section 3.2 of the MR.	PP has listed the monitored data as per the prescribed frequency or provided references to spreadsheet. Hence this CL is closed.
CL 8 Please indicate the name of the entity who has conducted the reservoir surface area measurement, the certificate no. and it's validity period in the MR.	PP's 1st response: The entity that conducted the reservoir surface area measurement is added and the certification no., validity period is also added.	Information relevant to the survey entity has been added in the revised MR and checked to be consistent with the evidence. Hence this CL is closed.

Draft report clarifications and corrective action requests by verification team	Summary of project participant response	Verification team conclusion
	DOE's follow-up request: Please provide the qualification certificate of the survey entity whose validity period is 03/03/2010-02/03/2015. PP's 2nd response: The certificate is provided.	
CL 9 Please provide the description of data collection procedures for all the monitored parameters in the MR.	The description of data collection procedures for all the monitored parameters is added in the MR.	Description of data collection procedures for all the monitored parameters has been provided in the revised MR. Hence this CL is closed.
CL 10 Please provide the calculation process of the power density and the justification of $PE_y=0$ in the MR.	PP's 1st response: The calculation process of the power density and justification of $PE_y=0$ is added in the MR. DOE's follow-up request: The calculation formula of Power Density is not fully consistent with the methodology. PP's 2nd response: The calculation formula is revised to be consistent with the methodology.	Calculation process of the power density and relevant justification has been provided in the revised MR. Hence this CL is closed.