Voluntary Carbon Standard Version 2007.1

Final Verification Report:

53217308-08/463

Name of Verification company:	Date of the issue:
TÜV NORD CERT GmbH	2010-05-04
Report Title:	Approved by:
1 MW Jiwa Small Hydel Project in Kullu, Himachal Pradesh.	Rainer Winter
Client:	Project Title:
Chevron Hydel Private Limited.	1 MW Jiwa Small Hydel Project in Kullu, Himachal Pradesh.
Summary:	

Chevron Hydel Private Limited has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project “1 MW Jiwa Small Hydel Project in Kullu, Himachal Pradesh.”, with regard to the relevant requirements of the VCS Guidelines/ VCSA Rules for project activities, as well as criteria for consistent project operations, monitoring and reporting.
The purpose of this project activity is to generate GHG free electrical energy from run of the river power project that replaces GHG intensive grid electricity. The technology consists of conversion of the potential energy available in the water head to mechanical energy using a hydro turbine and by connecting to a generator, mechanical energy is converted into electricity energy. In this process there occurs no greenhouse gas emissions or burning of any fossil fuels. Thus electricity is generated through sustainable means without causing any negative effect on the environment.
AMS I.D/Version 13: “Grid Connected Renewable Electricity Generation”, an approved methodology of UNFCCC CDM program has been applied.

There are no restrictions or uncertainties faced related to the verification of the project.

A risk-based approach has been followed to perform this verification. In the course of the verification, two (02) Corrective Action Requests (CARs), one (01) Forward Action Request (FAR) and one (01) Clarification Requests (CL) were raised and successfully closed.

The verification is based on the monitoring report, Validated PD, VCS Validation report and other supporting documents made available to the verifiers by project proponent.

The calculation of the project emission reductions is carried out in a transparent and conservative manner, so that the achieved actual net emission reduction for the period 04-01-2007 to 03-01-2009 is 10,539 tCO2e.

The conclusions of this report show, that the project, as it was described in the PD and the MR, is in line with all criteria applicable for the verification. 04-01-2007 to 03-01-2009 is 10,539 tCO2e.

Work carried out by:	Number of pages:
Mr. Archak Pattanaik Mr. Pankaj Mohan Mr. Abhishek K. Srivastava Mr. MP Kanal Mr. Lokesh Chandra Dube Ms. Arshi Vimal	18

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1 Introduction

1.1 Objective

The purpose of this verification, by means of independent checking of objective evidence, is as follows:

- to verify that the project is implemented as described in the VCS Project Description/PD/ for the monitoring period from 04-01-2007 to 03-01-2009;
- to confirm that the monitoring system is implemented and fully functional to generate voluntary emission reduction units (VERs/VCUs)[1] without any double counting during the monitoring period, and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation/XLS1/XLS2/XLS3.

1.2 Scope and Criteria

The verification of this VCS project is based on the monitoring plan of the VCS Project Description/PD/, the monitoring report/MR1/MR2/MR3/, the emission reduction excel sheet/XLS1/XLS2/ and other supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

The TÜV NORD JI/CDM CP has employed a risk-based approach in the verification, focusing on the identification of significant risks and reliability of project monitoring and generation of emission reductions.

1.3 VCS project Description

The purpose of this project activity is to generate GHG free electrical energy from run of the river power project that replaces GHG intensive grid electricity. The technology consists of conversion of the potential energy available in the water head to mechanical energy using a hydro turbine and by connecting to a generator, mechanical energy is converted into electrical energy. In this process there occurs no greenhouse gas emissions or burning of any fossil fuels. Thus electricity is generated through sustainable means without causing any negative effect on the environment.

1.4 Level of assurance

The verification report is based on the VCS Project Description/PD1/PD2/, the monitoring report/MR1/MR2/MR3/, the emission reduction excel sheet/XLS1/XLS2/XLS3 and

[1] As per VCS, Verified Emission Reductions (VERs) are considered to be VCUs only after the successful registration in an approved VCS registry.

other supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. The verification opinion is assured through the credibility of all documents checked.

2 Methodology

The verification of the project was carried out from February 2009 to May 2010
Preparations : 2009-02-24 to 2009-03-14
On-site verification: 2009-03-25 to 2009-03-26
(Draft) Reporting : 2009-03-31
Final Reporting : 2010-05-04

The verification consisted of the following steps:

- A desk review of the VCS 2007.1 Project Description/PD/ and supporting documents against the requirements of the VCS 2007.1;
- A desk review of the Monitoring Report/MR1/MR2/MR3/ and additional supporting documents which were submitted by the client.
- Review and verification of the emission reductions claimed in the calculation sheets/XLS1/XLS2/XLS3/ and cross checking it with the meter readings certified by the government body.
- Verification audit planning,
- On-Site assessment, of methodology adapted in archiving data relating to energy production, its accuracy (calibration of meters), break down records, preventive maintenance schedule, training records etc.
- Background investigation and follow-up interviews with personnel of the project developer,
- Verification reporting (Draft Verification Report no. 53217308-08/463 dated 2009/03/31 and Final Verification Report).

The criteria of this verification include the relevant rules and steps as set out in the VCS 2007.1/VCS/.

3 Verification Findings

The findings of verification are summarised in table 3-1

Verification topic (Cp VCS Verification Report Template)	No. of CAR	No. of FAR	No. of CL
D- Project Description	01	-	-
B- Baseline and additionality	-	-	-
M- Monitoring plan	-	01	-

Verification topic (Cp VCS Verification Report Template)	No. of CAR	No. of FAR	No. of CL
C- Calculation of GHG emissions	01	-	01
E- Environmental Impact	-	-	-
L- Local Stakeholder Comments	-	-	-
SUM	**02**	**01**	**01**

3.1 Remaining issues, including any material discrepancy, from previous validation

There was one FAR raised at the time of Validation . This was checked and found that the installation of check meter will again be checked during next verification. There were no other remaining issues, including material discrepancies from the earlier validation or determination stage of the project.

3.2 Project Implementation

The project has been implemented as described in the validated VCS Project Description/PD/. This was checked during site visit. The project activity involves the installation of 1000 KW run - of - the river small hydro project developed by Chevron Hydel Pvt. Ltd. for power generation on Jiwa Khad, a tributary of river Sainj in the Beas Basin. The project activity utilises hydro potential for generation of electricity. The technology consists of conversion of the potential energy available in the water head to mechanical energy using a hydro turbine and by connecting to a generator, mechanical energy is converted into electricity energy. The main meter was installed at site. The check meter installation was not carried out by the state electricity board (SEB) in spite of several requests from project proponent. The same were verified from the letters dated 4th June 2008 and 4th May 2009$^{/LTR/}$. The letters were checked and found to be satisfactory. During this period main meter has not gone out of order and the state electricity board is taking the measurements for joint meter readings which is a third party and not a project proponent. Hence this was accepted by the verification team. Since there is no Check meter installed, PP has kept one backup main meter in standby mode. In case the Main meter fails, in the absence of the Check Meter (to be installed by SEB), the Main meter will be replaced with the spare Main Meter kept as standby, in presence of Concern Authorities i.e. state electricity board.

Also, the Emission reductions are being claimed on the basis of Net Electricity Exported to the Grid recorded in the JMRs & Bill Invoices. Therefore, in case the meter does not work, the Energy Units will not get recorded and hence the same will not be claimed in the JMR and Bill Invoices. Therefore, the emission reductions will not be claimed in case if there is any malfunctioning of the main meter. This was found to be conservative approach hence accepted by verification team.

The project was found to be in line with the project description provided in the VCS Project Description/PD/ only one (01) CAR was raised and closed successfully.

	CAR D1			
Classification	☒**CAR**	☐**FAR**	☐**CL**	☐**None**
Description of finding	Project site address given at the cover page of monitoring report needs to be corrected as per actual location of the site			
Corrective Action #1	The project site address as mentioned on the cover page of the MR has been corrected.			
DOE Assessment #1	The DOE has checked that the address of the project site has been corrected on the cover page of the MR, this was matching with validated PD and hence the CAR is closed successfully.			
Conclusion	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements			

3.3 Completeness of Monitoring

The monitoring plan in the MR is clearly describing that only the main meter reading is being used for the billing purpose as no check meter is installed, it was also checked during the site visit. The check meter installation was not carried out by the state electricity board (SEB) in spite of several requests from project proponent. The same were verified from the letters dated 4th June 2008 and 4th May 2009/LTR/. The letters were checked and found to be satisfactory. Hence this needs to be checked during sub sequent verifications. Accordingly one (01) FAR is raised on this issue and will be checked during the subsequent verifications. All the calibration reports of main meter are checked and found appropriate by the verification team. Moreover the electricity export data and import data were taken from Joint meter reading (JMR) by SEB (Third party) in presence of personnel from project proponent side, therefore, considered authentic. The monitoring is carried out in accordance with the validated PD and approved validation report. This was checked during onsite and also by cross checking the JMR. The monitoring was also in line with the methodology used for the project activity.

Since there is no Check meter installed, PP has kept one backup main meter in standby mode (kept in stores by PP). In case the Main meter fails, in the absence of the Check Meter (to be installed by SEB), the Main meter will be replaced with the spare Main Meter (kept in stores by PP) kept as standby, in presence of Concern Authorities i.e. state electricity board.

Also, the Emission reductions are being claimed on the basis of Net Electricity Exported to the Grid recorded in the JMRs & Bill Invoices. Therefore, in case the meter does not work, the Energy Units will not get recorded and hence the same will not be claimed in the JMR and Bill Invoices. Therefore, the emission reductions will not be claimed in case if there is any malfunctioning of the main meter. This was found to be conservative approach hence accepted by verification team.

The Emission reduction calculations were also checked and found that the calculations has been carried out as per the validated PD and approved validation report. The ER calculations are rounded down now after corrections and hence accepted by the verification team.

	FAR M1			
Classification	☐ **CAR**	☒ **FAR**	☐ **CL**	☐ **None**
Description of finding	Check meter installation along with main meter at interconnection point as per the HPSEB norms is requested to facilitate for the crosschecking during next verification.			
Corrective Action #1	The PP will ensure that the check meter be installed with immediate effect and will be available for cross checking at the time of next verification.			
DOE Assessment #1	PP had insured that the check meter will be installed before second verification. Check meter needs to be checked during the second verification.			
Conclusion	☒ To be checked during the next periodic verification ☐ Appropriate action was taken ☐ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements			

3.4 Accuracy of Emission Reduction Calculations

The monitoring report[/MR2/MR3/] has been found to be in line with the validated PD, and also uses the same parameters for ensuring the accuracy of the emission reductions.

The formulas and factors used in the calculations of emission reductions are in accordance to the approved baseline methodology AMS-1.D, version 13. All aspects related to the direct and indirect GHG emissions relevant to the project activity have been addressed and calculations are presented in a transparent manner and are in line with the applied methodologies and tool.

No leakage is involved in the project activity, which is in line with the validated PD.

The set of calculations for the actual emission reduction of the 1st verification period (4th January 2007 to: 3rd January 2009) are transparently computed and presented in the spread sheet of VER calculation with the reference sources of data. Correct and

appropriate assumptions; default values; correction factors in accordance with AMS-1.D version 13 (including grid emission factor for project emission in accordance with tool to calculate the emission factor for an electricity system" – version 01.1 has been used for emission factor calculation by CEA version 4.) have been applied. The sources of project specific original data were cross–checked and found to be correct based on the evidence provided by the project developer.

The verification team has checked the underlying input values as well as the computation in the spreadsheet/xls2/xls3/. The VER sheet contains the actual emission reduction i.e. 10539 tCO2 under 1st verification (carried out in combination with validation) for 4th January 2007 to: 3rd January 2009 of 10 years of renewable crediting period.

Still one (01) corrective action request (CAR) and one (01) clarification request was raised and have been closed subsequently.

	CAR C1			
Classification	☒**CAR**	☐**FAR**	☐**CL**	☐**None**
Description of finding	In emission reduction calculation net export is taken into account for calculation of baseline emission; however it needs to be clearly indicated in the separate column in the table 3.			
Corrective Action #1	The net export figures are not required to be indicated in the separate column as the baseline emissions and project emissions are calculated separately and the net emission reduction has been clearly indicated in a separate column in table 3A and table 3B.			
DOE Assessment #1	It was checked by the DOE that net emission reduction figures has been kept in a separate column of table 3A and 3B of Monitoring Report/MR2/. Hence the CAR was closed successfully.			
Conclusion	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☐ The project complies with the requirements			

	CL C1			
Classification	☐**CAR**	☐**FAR**	☒**CL**	☐**None**
Description of finding	In VCS PD section 3.3 electricity import value is taken zero which shows that project is not supposed to import electricity, while as indicated in MR electricity is being imported from grid from initiation of project. This needs clarification.			

	CL C1
Corrective Action #1	During the start up of a hydro project there is a requirement for importing electricity from the grid which is a negligible amount hence it has been taken as zero. And the electricity imported during the running of the project has been accounted for in the monitoring report but there is no way in which the approx import can be calculated hence it has not been included in the VCS –PD.
DOE Assessment #1	The DOE is satisfied with the response of the PP that only the negligible amount of electricity is used during the start up of the hydro project so import of electricity is taken zero but the parameter is mentioned in the Monitoring Plan of the PD/PD/,and actual import in the Monitoring Report/MR/ hence accepted and closed.
Conclusion	☐ To be checked during the next periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

3.5 Quality of Evidence to Determine Emission Reductions

Proper data management inclusive of data acquisition and aggregation, data management system is being followed for the project activity.

All records needed for monitoring are archived in line with the requirements of the validated monitoring plan/PD/. No significant, lack of evidence and missing data were detected during on-site verification.

It is evident from the monitoring data that the monitoring system ensures for continuous operation.

All internal data are subjected to QA/QC measures as per the requirements of the validated monitoring plan/PD/. The QA/QC measures like calibration, data storage and archieving etc.

The monitoring personnel at site are well trained and follow reproducible routines. The people are well trained and this was checked by interviewing the personnal/IM01/. Thus, they are competent to carry out the relevant tasks with sufficient accuracy. All necessary monitored and measured raw data were checked during on-site verification (Ref Annex-2 of this report).

The emission reductions are calculated on the basis of the main meter readings at the project location. The electrical meters are locked and sealed and thus are tamper free. The PP submitted the documents/JMR/LTR/ as evidence to determine emission reductions and to cross check the values. These values were cross checked and the

verification team is satisfied with the quality of the evidence used to determine emission reductions. All the calibration reports /CAL/ of main meter are checked and found appropriate by the verification team. Moreover the electricity generation data are taken from Joint meter reading, therefore, considered authentic.

3.6 Management and Operational System

The allocation of responsibilities is documented and is followed as described in the validated PD. Routines for the archiving of data are defined and documented. Calculations laid down in the monitoring report are in line with validated PD/PD/. The overall authority of the project site belongs to company management.

All JMR data are subjected to QA/QC measures. All monitored data are archived in Physical form. The data will be kept for the whole crediting period as given in the validated PD/PD/.

The suitability of the monitoring system was assessed first during the desk review, followed by site visit and the interviews. The management and operation of the project has been found to be sufficient as per the monitoring plan of the VCS PD/PD/. The system in place on site has been found to be satisfactory as it ensures that the quality of the emission reductions achieved by the project is maintained.

4 Verification conclusion

The scope of this verification covers the determination of voluntary greenhouse gas emission reductions generated by the above mentioned project as per VCS 2007.1/VCS/. The verification is based on the VCS-PD/PD/, validation report/VAL/, monitoring report/MR1/MR2/ and the supporting documents made available to the verifiers by the project proponent.

As a result of the verification, the verifier confirms that:

- All operations of the project are implemented and installed as planned and described in the project description. The monitoring system is in place and functional.
- The installed equipment essential for generating emission reductions were also running and giving reliable readings as checked during the site visit.
- The monitoring plan is in accordance with the applied approved CDM methodology AMS-I.D, version 13.

As a result, the verifier confirms that GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. Also all the documents checked during site visit and verification process will be kept confidential and will not be disclosed at any time other than the Project Proponent consent as required by VCSA.

The monitoring period for which the verification has been conducted is from 04-01-2007 to 03-01-2009.

Verified emission in the above reporting period: 10,539 tCO_2e.

Project emissions	0	t CO_2 equivalents
Baseline emissions	10,539	t CO_2 equivalents
Emission reductions	10,539	t CO_2 equivalents

04-01-2007 to 31-12-2007 = 4859 tCO2e
01-01-2008 to 03-01-2009 = 5680 tCO2e

Archak Pattanaik
Verification Team Leader
Baroda, 2010-05-04

Rainer Winter
Final approval
Essen, 2010-05-04

Annexure I

Table 5-1: Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CL	Clarification Request
DDT	Dividend Distribution Tax
ER	Emission Reduction
GHG	Greenhouse gas(es)
MP	Monitoring Plan
MR	Monitoring Report
MW	Megawatt
MWh	Megawatt Hours
NEWNE	North East West North Eastern
PD	Project Description
PP	Project Participant
PPA	Power Purchase Agreement
QA/QC	Quality Assurance / Quality Control
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCSA	VCS Association
VCU	Voluntary Carbon Units
VER	Voluntary Emission Reduction
VVM	Validation Verification Manual

Annexure II

Table 6-1: Documents provided by the project participants as well as background investigation and assessment documents:

Reference	Document
/AMS-I.D./	Grid connected renewable electricity generation"; version 13 (EB 36)
/CAL/	Calibration reports of main meter serial number 06606097 dated 06-10-2006, 29-01-2009. (Meter replaced with second meter i.e. 08030221 on 4th June 2008). Calibration reports of main meter serial number 08030221 dated 04-06-2008. (Meter replaced with first meter i.e. 06606097 on 4th May 2009)
/CC/	Commissioning Certificates
/CEA/	CO_2 Baseline Database for the Indian Power Sector, November 2008, published by Central Electricity Authority, Ministry of Power, Government of India
/CON/	The signed contract between TUV NORD and CHPL for carrying out validation and verification of voluntary emission reduction dated 06-November-2008.
/ET/	"Tool to calculate the emission factor for an electricity system", version 01.1
/GHG-P/	GHG Protocol for project accounting Chapter 7.
/ISO/	ISO- 14064-2
/LTR/	Letter dated 4th June 2008 and 4th May 2009
/MR1/	Monitoring Report version 1 dated 05-03-2009
/MR2/	Monitoring Report version 2 dated 02-09-2009
/MR3/	Monitoring Report version 3 dated 19-03-2010
/PD/	Validated VCS Project Description version 2
/VCS /	The Voluntary Carbon Standard 2007.1 The Voluntary Carbon Standard Project Description template, dated 19 November 2007 Guidelines for The Voluntary Carbon Standard, dated 18 November 2008, VCSA rules.
/VVM/	CDM Validation and verification manual, Ver.1.1 EB 51
/XLS-1/	Spreadsheet version 1
/XLS-2/	Spreadsheet version 2

Reference	Document
/XLS-3/	Spreadsheet version 3

Table 6.2: Websites used

Reference	Link	Organisation
/unfccc/	http://www.cdm.unfccc.int	UNFCCC
/vcs/	http://www.v-c-s.org/	Voluntary Carbon Standard
/MoP/	www.powermin.nic.in	Ministry of Power , Government of India
/CEA/	www.cea.nic.in	Central Electricity Authority, Ministry of Power, Government of India
/MNRE/	http://mnes.nic.in	Ministry of New and Renewable Energy

Table 6-3: List of interviewed persons

Reference		Name	Organisation / Function
/IM01/	☒ Mr. ☐ Ms.	Neeraj Kanwar	Director, Chevron Hydel Pvt. Ltd.
/IM01/	☒ Mr. ☐ Ms.	Madan Lal	Site Incharge, CHPL
/IM01/	☒ Mr. ☐ Ms.	Suraj Kumar	Shift Incharge, CHPL
/IM02/	☒ Mr. ☐ Ms.	Anurag Juyal	Consultant, Gensol Consultant Pvt. Ltd.

1) Means of Interview: (Telephone, E-Mail, Visit)