VCS VERIFICATION / CERTIFICATION REPORT

VOLUNTARY CARBON STANDARD 2007

AMATITLAN GEOTHERMAL PROJECT IN GUATEMALA

VERIFICATION PERIOD:
10 FEBRUARY 2007 TO 11 DECEMBER 2008

REPORT Nº.2008-2075
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DET NORSKE VERITAS

VCS VERIFICATION / CERTIFICATION REPORT

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Client: EcoSecurities Group Plc	Client ref.: Steve Abrams - EcoSecurites

DET NORSKE VERITAS
CERTIFICATION AS

Climate Change Services

Veritasveien 1,
1322 HØVIK, Norway
Tel: +47 67 57 99 00
Fax: +47 67 57 99 11
http://www.dnv.com
Org. No: NO 945 748 931 MVA

Summary:
Det Norske Veritas Certification AS (DNV) has performed the verification of the emission reductions reported for the project activity "Amatitlan Geothermal Project" in Guatemala for the period from 10 February 2007 to 11 December 2008.
The project activity under consideration has already been validated by DNV (Report Nº: 2007-1945, Revision Nº 2, issued on 22 July 2008) and was registered as CDM project (UNFCCC reference number 2022) on 12 December 2008. The starting date of the crediting period of the CDM project activity is 12 December 2008. However, since the project was already in operation prior to the CDM registration of the project, the project developer has claimed the emission reductions that occurred prior to the CDM registration of project. These emission reductions can not be claimed as Certified Emission Reductions (CERs). The emission reductions are thus been claimed as Voluntary Carbon Units (VCU) under the Voluntary Carbon Standard 2007 (VCS2007). This is in accordance to the eminent VCS Guidance for projects that are registered in two GHG programs.
In DNV's opinion, the emission reductions reported for the "Amatitlan Geothermal Project" in the VCU monitoring report of 23 March 2009 are fairly stated. DNV is able to certify that the emission reductions from the "Amatitlan Geothermal Project" during the period from 10 February 2007 to 11 December 2008 amount to 104 344 tonnes of CO_2 equivalent.
DNV does not assume any responsibility towards the issuance and utilization of VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration. The verification of reported emission reductions is based on the information made available to DNV and the engagement conditions detailed in this report. Hence, DNV cannot be held liable by any party for decisions made or not made based on this report.

Report No.: 2008-2075	Subject Group: Environment	
Report title: Amatitlan Geothermal Project in Guatemala		
Work carried out by: David Freire da Costa, Marco A. Ratton		
Work verified by: Anjana Sharma		
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Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEF	Carbon Emission Factor
CER	Certified Emission Reduction(s)
CH_4	Methane
CO_2	Carbon dioxide
CO_2e	Carbon dioxide equivalent
DNV	Det Norske Veritas
FAR	Forward Action Request
GHG	Greenhouse gas(es)
GWP	Global Warming Potential
IETA	International Emissions Trading Association
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
PD	Project Description
PDD	Project Design Document
UNFCCC	United Nations Framework Convention for Climate Change
VCS	Voluntary Carbon Standard
VCU	Voluntary Carbon Unit

1 INTRODUCTION

EcoSecurities Group Plc have commissioned Det Norske Veritas Certification AS (DNV) to conduct the verification of emissions reductions reported for the CDM project activity "Amatitlan Geothermal Project"[1] (UNFCCC Reference Number 2022) for the period from 10 February 2007 to 11 December 2008 under the VCS program as per VCS 2007 standard. This verification covers the emission reductions that occurred prior to the registration of the "Amatitlan Geothermal Project" as a CDM project activity and thus prior to the start date of the CDM crediting period. This verification report includes the following:

(i) The findings from the verification according to Voluntary Carbon Standard 2007; and

(ii) VCU certification statement for the emission reductions.

For this initial verification of voluntary emission reductions, the period from 10 February 2007 to 11 December 2008 was considered and the verification process was carried out by DNV in accordance with the VCS 2007 standard, which came into effect on 19 November 2007.

1.1 Objective

Verification of "pre-registration" emission reductions from a project activity is an independent review and *ex-post* determination by a Verification Entity or Designated Operational Entity (DOE) (which is the approved verifier under CDM GHG program) of the monitored reductions in GHG emissions that have occurred as a result of the implementation of a CDM project activity during the period from the date when the project started to operate until the date when the project was actually registered as a CDM project activity by the CDM Executive Board (EB).

Certification is the written assurance by a Certification Entity that, during a specific period in time, a project activity achieved the emission reductions as verified.

The objective of this verification was to verify and certify the voluntary emissions reductions reported for the "Amatitlan Geothermal Project" for the period 10 February 2007 to 11 December 2008.

1.2 Scope and Criteria

1.2.1 Scope of the verification

The scope of the verification is:

- Verify whether the reductions generated by the project are in line with the VCS Verification Protocol and the information provided by the project participants contains all the necessary information to evidence the project's compliance with all criteria in the Voluntary Carbon Standard.
- Verify that the project was implemented as described in the Project Design Document (PDD) during the verification period.

[1] "Amatitlan Geothermal Project" was registered, as a CDM project activity, on 12 December 2008. Additional information regarding the referred project is available at the UNFCCC website: http://cdm.unfccc.int/Projects/DB/DNV-CUK1218173149.57/view.

- Confirm that the monitoring system was implemented and fully functional to generate emission reductions (VCU[2]) without any double counting during the whole verification period.
- By checking the monitoring records and the emissions reduction calculation, express a conclusion whether reported data are accurate, complete, consistent, and transparent, with a reasonable level of assurance and free of material error or misstatement.
- Validation of VCS requirements not covered by the CDM validation.

According to the VCS, the verification also includes an independent third party assessment of the project design. In particular, the project baseline, monitoring plan and the project compliance with relevant applicable protocols and criteria (i.e. UNFCCC, VCS, host Party and others) are to be validated in order to confirm that the project design, as documented, is sound and reasonable and meets the applicable criteria.

The project design, its eligibility as CDM project activity and the correct application of the approved CDM baseline and monitoring methodology ACM0002 (Version 6) /23/ were all already validated by the DOE Det Norske Veritas Certification AS (DNV) and the project was on 12 December 2008 registered as CDM project activity with the UNFCCC reference number 2022. The validation opinion by DNV is that the "Amatitlan Geothermal Project" as described in the PDD of 25 April 2008 (version 7) /3/ meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the approved baseline and monitoring methodologies ACM0002 (Version 6).

As the VCS recognizes the CDM as a GHG Program that meets its VCU Verification Criteria, this verification report thus only addresses VCS specific and unique criteria in terms of project design, applicability to the adopted methodology and additionality that have not been so far addressed in the Validation Report /8/ as per CDM requirements.

1.2.2 Validation Criteria for VCS requirements not covered by the CDM validation

As the project has already been validated under the CDM, a further validation shall be completed only for clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS Project Description template /29/ as required by the current VCS 2007 "Policy Announcement from the VCS Association - Further Guidance for Projects that are Registered in Two GHG Programs" /28/. The validation of these clauses was completed as part of the current VCU verification.

1.2.3 Verification Criteria

The verification team has focused on the identification of significant reporting risks and verifying the mitigation measures for these risks based on the recommendations in the "Validation and Verification Manual" /22/, "ISEA3000 (Revised) Assurance Engagements other than Audits or Reviews of Historical Financial Information" /24/ and/or "ISO/FDIS

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

14064-3 “Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions and employed a risk-based approach” /25/.

According to the requirements and guidance of VCS 2007, the criteria of this verification include the relevant applicable rules and steps for CER verification under the CDM excluding the following:

• The public availability of the VER/VCS Monitoring Report;

• The public availability the Verification Report and VCU Certification Statement.

1.3 VCS Project Description: Amatitlan Geothermal Project

1.3.1 Project Category

According to the VCS 2007 Guidelines and the list of Sectoral Scopes of the UNFCCC, the project is applicable under the following activity categories:

- Category 1 – Renewable energy (wind, PV, solar, thermal, biomass, liquid biofuels, geothermal, run-of-river hydro).

According to Annex A of the Kyoto Protocol, the project is applicable under the sectoral scope 1

- Energy Industries (renewable / non-renewable sources).

1.3.2 Geographic Location

The project is located at the Municipalities of San Vicente Pacaya, Amatitlan and Villa Canales, Guatemala. The exact location of the project is defined using GPS coordinates. These GPS coordinates are for the Amatitlan Geothermal Field:

Longitude 14º 23’ 00’’ N - 14º 25’ 00’’N

Latitude 90º 35’ 00’’W - 90º 37’ 00’’ W

1.3.3 Project Background

The Amatitlan Geothermal Project developed by Ortitlan Ltd. a geothermal power plant located in the Department of Escuintla, in Guatemala. The total installed capacity of the project is 25.2 MW. The plant utilizes 3 turbines (being two with installed capacities of 12 MW each, and one at 1.2 MW) and has an annual average power generation potential of 162,000 MWh per annum.

The purpose of the project is to utilize the geological resources of the Amatitlan Geothermal Field in a geothermal power plant to generate renewable energy and dispatch it to the Guatemalan Grid (“SIN – Sistema Nacional Interconnectada” / Interconnected National System). The electricity grid is relatively high carbon intensive, with an operating margin emission factor of 0.778 tCO_2/MWh and a build margin emission factor of 0.514 tCO_2/MWh. The CM – Combined Margin Emission Factor of the Grid is 0.646 tCO_2/MWh.

The electricity supplied to the grid by the project activity is measured by INDE (“Instituto Nacional de Electrificación” / National Electrification Institute), which has signed a Power Purchase Agreement (PPA) with Ortitlan Ltd..

While the project activity encompasses the installation of a new grid-connected renewable power plant, the project reduces GHG emissions by displacing electricity would otherwise

have been generated in the existing fossil fuel powered plants in the grid or by the addition of new generation.

The CDM baseline and monitoring methodologies used is ACM0002 – " Consolidated methodology for grid-connected electricity generation from renewable sources" (Version 6)

1.4 Level of assurance

As the VCS 2007 only recognizes verified emission reductions, DNV has focused on providing a reasonable level of assurance that the emission reduction calculation methodology used is appropriate and correctly applied, and that emission reductions have been accurately monitored.

For verifying/certifying VCUs, the desired level of assurance was based on the combined quantitative assessment of the accuracy of monitoring project performance and the identification of material risks, in accordance with the recommendations available in the Validation and Verification Manual (version 01) /22/. For this verification, DNV is able to give a reasonable level of assurance.

2 VERIFICATION METHODOLOGY

The verification of the emission reductions has assessed all factors and issues that constitute the basis for the emission reductions from the project according to applicable CDM baseline and monitoring methodology ACM0002 (Version 6).

Verification team

The verification team consisted of the following personnel:

				Type of involvement					
Role/Qualification	***Last Name***	***First Name***	***Country***	Desk review	Site visit / Interviews	Reporting	Supervision of work	Technical review	Expert input
GHGauditor / technical team leader	Ratton	Marco	Brazil	x			x		
GHG auditor	Costa	David	Brazil	x	x	x			
Technical reviewer	Sharma	Anjana	India					x	

Duration of verification

Preparations:	24 November 2008
On-site verification:	26 – 27 November 2008
Additional round of interviews and checking of documentation with the project participants:	15 – 18 December 2008
Reporting and QA/QC:	15 December 2008 to 01 June 2009

2.1 Review of Documentation

The following main documents were assessed as a part of the verification audit:

- The VER/VCU Monitoring Report (version 1) of 26 November 2008 for the period from 01 February 2007 to 31 October 2008 /1/;
- The VER/VCU Monitoring Report (final version) of 23 March 2009 for the period from 10 February 2007 to 11 December 2008 /2/; The monitoring report was revised in order to provide the correction and clarifications requested in the Verification Protocol (see Appendix B) and in order to extend the verification period until the date before the registration of the project as CDM project, which occurred on 12 December 2008. Hence, the revised verification period is 10 February 2007 to 11 December 2008.
- Monthly electricity sales receipts for the period from 10 February 2007 to 11 December 2008, issued by "Comercializadora Comertitlan S.A." to INDE ("Instituto Nacional de Electrificación" / National Electrification Institute) /4/. It is noteworthy that each assessed electricity sale receipt refers to electricity generated in the previous

month (i.e. electricity sale receipt for October 2007 corresponds to electricity exported to the grid in September 2007). These documents represent evidences of the amount of net electricity exported to the Guatemalan grid by the Amatitlan Geothermal Project;

- Monthly reports of electricity exported by Amatitlan Geothermal Project to the grid /7/. These reports are normally sent to INDE in a monthly basis for double-checking;
- The Environmental License RES. N° 942-2005/CANV/KC /21/, which was issued by the Guatemalan Ministry of Environmental and Natural Resources (Ministério de Ambiente y Recursos Naturales, Guatemala, C.A.) on 27 April 2007. It was thus confirmed that the project activity is in accordance to applicable requirements of the environmental legislation in the host country;
- The Operation License ME-016-2007 /20/, which was issued on 26 January 2007 by Majority Market Administrator (Administrador del Mercado Mayorista), which states that the project activity is in accordance to the local requirements established in the Commercial Coordination Norm N° 14 – "Commercial Measurement System" (Norma de Coordinación Comercial N° 14 – "Sistema de Medición Comercial");
- VCU calculation spreadsheets /5/ and /6/.

In addition, the project's Project Design Document (PDD), in particular the Monitoring Plan included in the PDD, and the Validation Report (Report Nº: 2007-1945, Revision Nº 2, issued on 22 July 2008 by DNV) were also assessed. The full list containing all the documents assessed during this verification process is available at the "References" section of this report.

2.2 Site Visit

On 26 and 27 November 2008, DNV conducted a site visit to the Amatitlan Geothermal Project's facilities.

During the visit, DNV was able to confirm the values of total installed electricity generation capacity (as described on sections 1.3 and 3.2 of this report), the project was implemented and has been operated as described in the registered version of the PDD /3/. DNV's assessment included in particular the verification of the internal measurement records, calculation spreadsheet evidences as well as the effectiveness of electricity generation and the monitoring of electricity exported to the Guatemalan grid. The consumption of electricity by Amatitlan Geothermal Project from the Guatemalan grid, as well as the monitoring records of all parameters related to project emissions, including but not limited to fossil fuel consumption, associated calculation spreadsheets and correlated documental evidences were also assessed and verified by DNV.

Moreover, the electricity sales receipts and internal spreadsheets/reports for daily exported and imported electricity (issued and maintained by staff of the power plant) were checked.

The verification of reported data was carried out by means of:

- Checking individual monthly sales receipts issued by "Comercializadora Comertitlan S.A." to "Instituto Nacional de Electrificación (INDE)".
- Confirmation of the correct aggregation of spreadsheets/reports for daily exported and imported electricity issued by Comertitlan and INDE. Comertitlan monthly

cross checks measurement reports for exported and imported electricity issued by INDE with such internal spreadsheets/reports.

- Verifying the effectiveness of the data quality assurance and control, including data associated to project emissions.

2.3 Assessment

The analysis of documentation, interviews and site visit allowed the assessment of the following processes and assumptions (including QA/QC related issues):

- Electricity generation, consumption and export to the grid is continuously monitored. The amount of electricity exported to the grid and consumed from the grid were verified by the assessment of electricity sales receipts issued by Comertitlan to INDE and cross checked using internal measurement records. In addition, there are electricity meters under the responsibility of INDE at the point where the power plant is connected to transmission lines of the Guatemalan grid. The net quantity of electricity exported to the grid is multiplied by the grid emission factor (0.646 tonCO_2/MWh) defined ex-ante in the registered CDM project activity;
- The steam flow at the power plant is measured by two Rosemount flow meters installed at the steam pipes. Flow meter tagged 2324 measures steam flow from wells AMF 1 and AMF 2, and flow meter tagged 2412 from wells AMF 5 and AMF 6. Data is sent to the control room via SCADA. Manual readings are taken every hour at the control room, then daily and monthly reports are generated digitally and hardcopies (logbooks) are kept at the control room. The internal electronic records registered by SCADA software has been utilized for working out monthly steam flows. The "total steam flow" data used in the emissions reductions calculation spreadsheet is obtained through the sum of the average values of steam flow, which is hourly measured by each of the two Rosemount flow meters (flow meters tagged 2324 and 2412), then, it is multiplied by 24 (hours per day) and again multiplied by the number of the days of each month, as described below:
    - Total Steam Flow = (Average values of steam flow #2324 + Average values of steam flow #2412) x 24 x days/month.
- Steam analyses of Non-Condensable Gases' (NCG) are periodically monitored. Staff of the geothermal plant takes steam samples according to the ASTM E1675 – 95a Standard. Samples are delivered to an external laboratory, named Thermochem, to be analyzed and obtain, among other gases and parameters, CO_2 and CH_4 fractions of the steam flow. The CO_2 and CH_4 fractions of the steam flow are used for the project emissions determination.
- Fossil fuel (diesel) consumption is constantly monitored for the determination of project emissions associated to the firefighting system and the emergency generator. Fossil fuel (diesel) consumption is monitored and used to determine project emission reductions.

The verification of reported data and information was conducted by means of:

- Checking individual internal measuring records for electricity generation;

- Confirmation of the correct compilation of emission reduction calculation spreadsheets (values included in the spreadsheet were individually checked against the records listed above);
- Verifying the effectiveness of the data quality assurance and control;
- Confirmation that the registered CDM project activity meets the methodology requirements and additional VCS 2007 requirements.

2.4 Report of Findings

Findings established during the verification may be that:

i) the verification is not able to obtain sufficient evidence for the reported emission reductions or part of the reported emission reductions. In this case these emission reductions shall not be verified and certified;

ii) the verification has identified material misstatements in the reported emission reductions.

While aiming to resolve any outstanding issues which needed be clarified about the project design, findings established during the verification can either be seen as a non-fulfilment of the VCU Verification Criteria or where a risk to the fulfilment of project objectives is identified. Emission reductions with material misstatements shall be discounted based on the verifiers' *ex-post* determination of the achieved emission reductions.

Corrective action requests (CAR) are issued, where:

i) mistakes have been made with a direct influence on project results requiring adjustments of the VERs/VCUs monitoring report;

ii) applicable methodological specific requirements have not been met.

A request for clarification (CL) may be used where additional information is needed to fully clarify an issue.

A forward action request (FAR) is be issued, where:

i) the actual project monitoring and reporting practices requires attention and /or adjustment for the next consecutive verification period, or

ii) an adjustment of the MP is recommended.

In the context of FARs, risks have been identified, which may endanger the delivery of high quality emissions reductions in the future, i.e. by deviations from standard procedures as defined by the monitoring plan. As a consequence, such aspects should receive a special focus during the next consecutive verification. A FAR may originate from lack of data sustaining claimed emission reductions.

DNV was able to verify that the GHG emission reductions reported for the "Amatitlan Geothermal Project" in the VCU monitoring report of 23 March 2009 are fairly stated.

No forward action request (FAR) was identified for the future verification of Voluntary Emission Reductions (VERs) under the Voluntary Carbon Standard (VCS) 2007.

3 VERIFICATION FINDINGS

This section summarises the findings from the verification of the voluntary emission reductions reported for the "Amatitlan Geothermal Project" for the period from 10 February 2007 to 11 December 2008. The findings of the verification are documented in more detail in the verification checklist given in Appendix A.

3.1 Remaining Issues from Previous Validation or Verification

As this is the first verification of Voluntary Carbon Units (VCU for Amatitlan Geothermal Project) under the Voluntary Carbon Standard (VCS) 2007, no previous CAR or FAR were identified with regards to remaining issues from any previous verification or from the validation stage. In addition, the Validation Report (Report Nº: 2007-1945, Revision Nº 2, issued on 22 July 2008 by DNV) was also assessed and no opened CAR or FAR was identified as well.

3.2 Project Implementation

As informed by the project participant and verified by DNV during the site visit, the actual installed capacity of Amatitlan Geothermal Project is in accordance to the capacity stated in the validated and registered PDD. The PDD states that Amatitlan Geothermal Project has 3 turbines, being two with installed capacities of 12 MW each, and one at 1.2 MW.

The project utilizes the geological resources of the Amatitlan Geothermal Field in a geothermal power plant to generate renewable energy and dispatch it to the Guatemalan Grid ("Sistema Nacional Interconnectada" / Interconnected National System).

DNV verified that the calibration of the electricity meter is assured by Power Measurement Company, which is the manufacturer of the power meters installed in the project activity. According to the User Guide of Power Logic ION 8600 /16/, the following is stated regarding the calibration of the power meters:

"*All ION meters are tested and verified at the factory according to IEC (International Electrotechnical Commission) standards. ION meters are digital and do not require calibration, only verification of their accuracy*".

An additional calibration certificate was issued, on 29 April 2009, by SEMELEC, S.A. /17/, which is a company hired by AMM (Administrador del Mercado Mayorista / Majority Market Administrator) for performing the verification of the power meters. AMM is the operative entity of INDE, which is the National Electrification Institute of Guatemala.

According to the calibration certificate /17/, the main meter has a discrepancy of - 0.276%. The accuracy range accepted by the AMM is +/- 0.2% (between -0.2% and +0.2%), according to the regulatory norm "NCC-14". Therefore, this indicates that the main electricity meter has been measuring 0.076% less electricity. In terms of electricity and ERs, this is equal to 166,613 kWh not invoiced by Ortitlan Ltd and 107 emission reductions not claimed by Amatitlan Geothermal Project. Hence, DNV considers that, even considering that a discrepancy was identified in the main power meter, the impact of such divergence in the project activity is considered conservative and, therefore, acceptable.

The control system at the geothermal power plant is automated and assures continuous operation of Amatitlan Geothermal Project.

3.2.1 Eligible GHGs

The project activity contributes to reductions in the emissions of carbon dioxide (CO_2) by generating electricity using a renewable source, thus, displacing electricity generation based on fossil fuels in the Guatemalan grid.

3.2.2 Project Start Date and Emission Reduction Start Date

The starting date of the project activity and consequently emission reduction start date was 10 February 2007.

3.2.3 Public Funding and Grants

The validation of the CDM project did not reveal any information that indicated that the project received any public funding.

3.2.4 Project Boundary/GHG Assessment Boundary

The project boundary is clearly defined as the site of the project activity as well as the system boundary which is defined as the Guatemalan grid system to which the project plant is connected by transmission lines.

3.2.5 Baseline Determination

While the baseline determination for the project activity was previously assessed by the Designated Operational Entity (DOE) Det Norske Veritas Certification AS (DNV) as part of the CDM validation of the project, it is confirmed that:

i) The project correctly applies the approved baseline and monitoring methodology ACM0002 (Version 6) titled " Consolidated methodology for grid-connected electricity generation from renewable sources".

ii) The baseline and monitoring methodologies have been correctly applied and the assumptions made for the selected baseline scenario are sound.

3.2.6 Project Additionality

While the assessment and demonstration of additionality for the project activity was previously assessed by DNV as part of the CDM validation, it is confirmed that project is not a likely baseline scenario, and that emission reductions resulting from the project are additional.

3.2.7 GHG Emission

While baseline and project GHG emissions were previously assessed by DNV as part of the CDM validation, it is confirmed that the approach for determining project and baseline emissions are appropriate and in accordance with the selected baseline and monitoring methodologies.

The calculation of the baseline emission factor was performed as required by the methodology. The parameters were calculated ex-ante. The Operating Margin (OM) emission factor calculation was based on the simple OM method, option (a) of the ACM0002. This method was selected because low cost/ must run resources constitute less than 50% of total grid generation in average of the five most recent years.

The Build Margin (BM) emission factor was also calculated ex-ante based on the most recent information available at the time of PDD submission (data from 2003 to 2005). Details about the data used for calculation of OM and BM emission factors were presented in the PDD and the sources of data were verified by the local assessor during the validation process.

The grid emission factor calculated ex-ante from OM and BM emission factors above mentioned and applied for baseline emission reductions estimative was 0.646 tCO_2/MWh, which is the combined margin emission factor.

Based on the monitored electricity supply to the grid and ex-ante grid emission factor, the reported GHG emission reductions from the project are 104 344 tonnes CO_2 equivalent (tCO_2) during the period from 10 February 2007 to 11 December 2008.

3.2.8 Secondary Effects

Regarding secondary effects (leakage), although no leakage calculation is needed, as explained in the applicable methodologies, no sources of leakage were identified given that the electricity generating equipment is not transferred from any other activity.

3.2.9 Impacts on Sustainable Development

While project environmental impacts and confirmation from the host country that the project assists in achieving sustainable development project contribution was previously assessed by DNV as part of the CDM validation, it is DNV's understanding that the project's social and environmental impacts have been sufficiently addressed. Furthermore, the DNA of Guatemala has provided confirmation that the project assists in achieving sustainable development, through the Letter of Approval issued on 22 November 2007 /30/.

3.3 Completeness of Monitoring

The monitoring period of Amatitlan Geothermal Project covers the period from 10 February 2007 to 11 December 2008. The key parameters needed to be monitored are the following:

i) The amount of electricity generated and electricity consumed by the geothermal plant (MWh/month). Data regarding the electricity generation and electricity consumption is obtained from the internal database records (electronic and manual logbooks) and from issued invoices. The emission factor of Guatemalan grid was determined ex-ante as 0.646 tCO_2/MWh.

ii) The total steam flow (tones/month). Readings are recorded continuously from the steam flow meters. Data is sent via SCADA and gathered at the control room.

iii) The steam analyses (parts per million (ppm)) of Non-Condensable Gases (NCG). Steam sampling was done under the ASTM E1675 – 95a Standard. Samples are taken from the wells and the mainstream line, and then analyzed in order to obtain their respective proportion of CO_2 and CH_4 emissions.

iv) Fossil fuel (diesel) consumption is constantly monitored for the determination of the project emissions from the firefighting system and the emergency generator. The fossil fuel (diesel) consumption is monitored and deducted from gross emissions reductions.

The project emissions worksheet /6/ contains the calculation of emissions from NCG and fossil fuel consumption.

The emissions reductions calculation worksheet contains the calculation of monthly and total emission reductions from the Amatitlan Geothermal Project claimed for the monitoring period from 10 February 2007 to 11 December 2008.

While the application of the monitoring methodology was previously assessed by DNV as part of the CDM validation, it is DNV's contention that the application of the monitoring methodology is transparent. For the considered verification period, all indicators stated in the applicable monitoring methodology ACM0002 (Version 6) were correctly monitored and reported.

The emission reductions for the period from 10 February 2007 to 11 December 2008 were correctly calculated on the basis of the monitoring methodology ACM0002 (Version 6).

3.4 Accuracy of Emission Reduction Calculations

According to the ACM0002 (Version 6), for the emissions reductions calculation, the following formulas are applied:

$$ER = BE - PE - L \quad (1)$$

$$BE = EG \times EF \quad (2)$$

$$PE = PE_{steam} + PE_{FF} \quad (3)$$

$$PE_{steam} = (W_{main\_CO2} + W_{main\_CH4} \times GWP_{CH4}) \times M_{steam} \quad (4)$$

$$PE_{FF} = \Sigma F_{diesel} \times COEF_{diesel} \quad (5)$$

The emission reductions (ER, expressed in tCO_2e) are the actual emission reductions resulting from the Baseline Emissions (BE, expressed in tCO_2e) minus the Project Emissions (PE, expressed in tCO_2e) minus leakage (which is zero).

The BE is the product of the grid Emissions Factor (EF, expressed in tCO_2e/MWh) multiplied by the net electricity supplied by the geothermal project to the grid (MWh). The emission factor of Guatemalan grid was determined ex-ante as 0.646 tCO_2/MWh as defined in the registered CDM project activity.

In case of Amatitlan Geothermal Project, the project emissions to be considered are:

i) The fugitive carbon dioxide and methane emissions that are accounted due to the release of NCGs from the produced steam (PE_{steam}, expressed in tCO_2e). Therefore, the average mass fractions of carbon dioxide (W_{main_CO2}, expressed in percentage) and methane (W_{main_CH4}, expressed in percentage) in the produced steam, the global warming potential of methane (GWP_{CH4} = 21 tCO_2/tCH_4) and the mass of steam produced (M_{steam}, expressed in tones/month), also need to be considered, and;

ii) The carbon dioxide emissions from fossil fuel combustion (PE_{FF}, expressed in tCO_2). Therefore, the sum of diesel consumption as fossil fuel (ΣF_{diesel}, expressed in tons of diesel/month) and the related coefficient emission factor of diesel ($COEF_{diesel}$, expressed in tCO_2e/tdiesel), also need to be considered;

iii) According to ACM0002 (Version 6) and the validation report of the registered PDD, there is no need to consider leakage in case of Amatitlan Geothermal Project.

The GHG emission reductions were calculated correctly on the basis of the approved CDM baseline and monitoring methodology ACM0002 (Version 6), the formulae given in the VCU monitoring report of 23 March 2009 and the project design document validated by DNV.

The CO_2 emissions reductions were correctly calculated using the net electricity exported to the Guatemalan grid through INDE and the validated grid emission factor of the Guatemalan grid of 0.646 tCO_2e/MWh, calculated ex-ante as combined margin according to the baseline methodology ACM0002 (Version 6).

In addition, the data related to the amount of electric energy sold to the grid, which was used in emissions reductions calculation spreadsheet, was crosschecked and all the information is in accordance with the monthly electricity sale receipts issued by Comertitlan to INDE from 10 February 2007 to 11 December 2008.

3.5 Quality of Evidence to Determine Emission Reductions

DNV was able to verify that Amatitlan Geothermal Project has automated control system, known as "SCADA", where the operation including the electricity generated, consumed and exported to the grid is continuously monitored, among several other parameters, such as: steam flow, steam temperature, steam pressure, status of operational equipments, etc.

The amount of electricity generated from renewable energy sources (geothermal) and dispatched to the grid is been continuously metered by revenue ION power meters. The metered data is sent via SCADA to the control room, where data is daily recorded digitally into hard disk and manually into logbooks. Every month the electronic data is downloaded and a monthly report is generated /7/, this report is submitted to Power Market Authority (Administrador del Mercado Mayorista [AMM]) for cross checking the information.

Once the electricity dispatched to the grid is certified by AMM an invoice will be processed by Ortitlan Limitada. Copies of the logbooks ("Bitacoras") /11/ /13/ and electricity sale receipts /4/ from February 2007 to November 2008 were provided by the project participants and assessed by DNV.

As electricity sale receipts are issued after the end of every month, the internal database records are the support documents used for verify the net electricity dispatched to the grid for the period from the 1st to 11th of December 2008.

The steam flow is measured by two Rosemount flow meters installed at the steam pipes. The flow meter tagged 2324 measures steam flow from wells "AMF 1" and "AMF 2", and the flow meter tagged 2412 from wells "AMF 5" and "AMF 6". Data is sent to the control room via SCADA. Manual readings are taken every hour at the control room, then daily and monthly reports are generated digitally and hardcopies (logbooks) are kept at the control room. The internal electronic records registered by SCADA software are been utilized for working out monthly steam flows.

For February 2007, in particular, there is no electronic information recorded regarding steam flow (tones/month). Emissions reductions and project emissions (from NCGs) calculation for February 2007 were adjusted based on the most conservative ratio obtained by the relation between the "total steam flow and the gross electricity generation (steam/kWh)". Values to obtain the referred ratio were based on data from the rest of the period, from 1 March 2007 to 11 December 2008. Calculations can be reviewed in the following spreadsheet: "171-Amatitlan_WB_2008Ver 4.xls (Raw Data)". The electricity generated during February 2007 was measured by the revenue electricity meters.

Staff of the geothermal plant takes steam samples according to the ASTM E1675 – 95a Standard. Samples are delivered to an external laboratory to be analyzed and obtain CO_2 and CH_4 fractions of the steam flow. Steam analyses have been periodically accomplished. For the whole monitoring period, four steam analyses of Non Condensable Gas (NCG) emissions have been carried out. The average of the four NCG fractions was used in order to calculate project emissions. Copies of the Non-Condensable Gases' (NCG) reports /18/ were provided by the project participants.

The project emissions associated to fossil fuel (diesel) consumption from the fire-fighting system and the emergency generator were monitored and deducted from the gross emissions reductions.

It is important to highlight that Amatitlan Geothermal Project uses its own generated electricity to power all ancillary equipment of the power plant. In case of emergencies, stoppages or lack of energy, if needed, the power plant makes use of their emergency generator (which is fuelled by diesel) or electricity imported from the grid. During the site visit on 26 and 27 November 2008, DNV was able to check that the operators of the plant keep manual and electronic records of all stoppages of the plants.

In addition, the electricity consumed by Amatitlan Geothermal Project from the grid is monitored by both Ortitlan and INDE. The amount of imported electricity is monthly indicated in the electricity sale receipts issued by Ortitlan to INDE and such amount of electricity is deducted from the total energy exported to the grid by Amatitlan Geothermal power plant. Therefore, DNV was able to verify that the emissions reductions of the project activity are indeed calculated only considering the net electricity exported to the grid, thus discounting the amount of electricity consumed from the grid by the geothermal power plant.

3.6 Management and Operation System

Data is collected according to well defined data collection procedures:

i) Data of electricity exported is collected by the power plant operator and recorded in a daily report datasheet;

ii) Monthly data is aggregated from daily report and the data is compared with the amount reported by INDE and the invoices are monthly issued to INDE.

iii) Data is processed by the electronic data management system (SCADA) and it is used to calculate emission reductions and to produce the VCU monitoring report.

The site visit at the Amatitlan Geothermal power plant confirmed that monitoring and reporting is carried out consistently and in line with established procedures.

As all data is registered on both paper and electronic format and cross checked with electricity sale receipts issued by Comertitlan to INDE, the VCU monitoring report can easily be retrieved from these records.

4 CERTIFICATION STATEMENT

Det Norske Veritas Certification AS (DNV) has performed the verification of the emission reductions reported for the CDM project activity "Amatitlan Geothermal Project" (UNFCCC Registration Ref. No. 2022) for the period from 10 February 2007 to 11 December 2008. As these emission reductions occur prior to the registration of the project as CDM project activity, these emission reductions cannot be claimed as Certified Emission Reductions (CERs). The emission reductions are thus claimed as Voluntary Carbon Units (VCU) under the Voluntary Carbon Standard 2007 (VCS 2007).

Ortitlan Ltd. and EcoSecurities Group Plc are responsible for the collection of data in accordance with the validated monitoring plan and the reporting of GHG emissions reductions from the project.

It is DNV's responsibility to express an independent verification statement on the reported GHG emission reductions from the project. The project design was previously assessed by the DNV as part of the CDM validation and registration of the project. DNV's validation opinion is that the project design as documented is sound, reasonable and meets the relevant UNFCCC and host Party criteria. The project was registered as a CDM project activity on 12 December 2008.

DNV conducted the verification on the basis of the CDM monitoring methodology ACM0002 – " Consolidated methodology for grid-connected electricity generation from renewable sources*" (Version 6), the monitoring plan included in the PDD of the project and the VCU monitoring report of 23 March 2009. The verification included i) checking whether the provisions of the monitoring methodology ACM0002 (Version 6) and the monitoring plan in the PDD were consistently and appropriately applied and ii) the collection of evidence supporting the reported data.*

DNV's verification approach draws on an understanding of the risks associated with reporting of GHG emission data and the controls in place to mitigate these. DNV planned and performed the verification by obtaining evidence and other information and explanations that DNV considers necessary to give reasonable assurance that reported GHG emission reductions are fairly stated.

In DNV's opinion, the GHG emissions reduction for the registered CDM project activity "Amatitlan Geothermal Project" as reported in the VCU Monitoring Report issued on 23 March 2009 are fairly stated and the project design meets all VCU Verification Criteria.

The GHG emission reductions were correctly calculated on the basis of the approved monitoring methodology of ACM0002 (Version 6) and the monitoring plan contained in the validated Project Design Document for the project.

Det Norske Veritas Certification AS is able to certify that the emission reductions from the "Amatitlan Geothermal Project" during the period 10 February 2007 to 11 December 2008 amount to 42,776 tons in 2007and 61,568 in 2008, and a total of 104,344 tonnes of CO_2 equivalent.

DNV does not assume any responsibility towards the issuance and utilization of the VCUs hereby verified and certified. Request for issuance of VCUs shall be made by the project proponent to an approved VCS Program Registry based on the requirements set out under the most recent version of the VCS Program Guidelines clause on VCS Registration.

The verification of reported emission reductions is based on the information made available to DNV and the engagement conditions detailed in this report. DNV cannot be held liable by any party for decisions made or not made based on this report.

Rio de Janeiro, 01 June 2009

David Freire da Costa
GHG Auditor

Oslo, 01 June 2009

Michael Lehmann
Technical Director

5 REFERENCES

/1/ EcoSecurities, *VER/VCU Monitoring Report – Amatitlan Geothermal Project*. Monitoring period: from 01 February 2007 to 31 October 2008, VER – CDM 2022-M1 of 26 November 2008.

/2/ EcoSecurities *VER/VCU Monitoring Report – Amatitlan Geothermal Project*. Monitoring period: from 10 February 2007 to 11 December 2008, VER – CDM 2022-M1 of 23 March 2009.

/3/ EcoSecurities *EcoSecurities Project Design Document* for *Amatitlan Geothermal Project* version 7 of 25 April 2008. Available at: http://cdm.unfccc.int/UserManagement/FileStorage/V2B1LC48WSXHUJ59GY0MQTA6PDNFEI

/4/ Monthly electricity invoices from 10 February 2007 to 11 December 2008, issued by "Comercializadora Comertitlan S.A." to INDE ("Instituto Nacional de Electrificación" / National Electrification Institute).

/5/ Spreadsheet for Calculation of Voluntary Emission Reductions (Amatitlan_Workbook_2007-2008.xls).

/6/ Spreadsheet for Calculation of Voluntary Emission Reductions (171-Amatitlan_WB_2008Ver 4.xls).

/7/ Ortitlan Limitada: Monthly reports of electricity exported by Amatitlan Geothermal Project to the grid and cross-checked in a monthly basis with INDE.

/8/ DNV: Validation Report – Amatitlan Geothermal Project. Report Nº: 2007-1945, Revision Nº 2, issued on 22 July 2008. Available at: http://cdm.unfccc.int/UserManagement/FileStorage/N1U70KQEM6GXD8A35JLHT4WIRSPY9F

/9/ Ortitlan Limitada: "ORT-No.15 Constitución de Unidad Económica" (ORT – Economic Unit Contract 15) – Proof of Title document.

/10/ Spreadsheet for the calculation of project emissions associated with diesel consumption (Amatitlan_DieselConsumption_2007-2008.xls).

/11/ Ortitlan Limitada: Internal manual records registered by the operators (logbooks), known as "bitacoras", for the period from March 2007 to June 2007.

/12/ Ortitlan Limitada: Internal electronic records registered in the SCADA software by the electronic measurement equipments/devices for the period from July 2007 to December 2008.

/13/ Ortitlan Limitada: Internal manual records registered by the operators (logbooks), known as "bitacoras", containing the gross energy reading data reported for the following months: Apr/07, May/07, Jul/07, Oct/07 and Dec/07.

/14/ ELVATRON S.A.: Calibration certificates of the two steam flow meters used in the project activity.

i) Flow Meter ID: FT 2324; Manufacturer: Rousemount Inc.; Model: 3095MFA5200ZC; Serial Number: 8120920; Calibration Certificate issued

on 02 December 2007 by ELVATRON S.A.;

ii) Flow Meter ID: FT 2412; Manufacturer: Rousemount Inc.; Model: 3051CDA2A22A; Serial Number: 485S160; Calibration Certificate issued on 02 December 2007 by ELVATRON S.A.

/15/ POWER MEASUREMENT: Calibration certificates of the two power meters used in the project activity.

i) Power Meter: Primary (Main); Manufacturer: Power Measurement; Model: ION8600; Part Number: P8600C4C0H6A0A0A; Serial Number: PT-0512A187-01; Certificate of Compliance and Calibration, issued on 21 December 2005, by Power Measurement;

ii) Power Meter: Secondary (Back-up); Manufacturer: Power Measurement; Model: ION8600; Part Number: P8600C4C0H6A0A0B; Serial Number: PT-0610A098-01; Certificate of Compliance and Calibration, issued on 10 October 2006, by Power Measurement.

/16/ Power Logic ION 8600: User Guide – Chapter 22, Verifying Accuracy – page 215 - May 2007

/17/ SEMELEC, S.A.: Calibration certificate (Certificate N° AMM-09-0240), issued on 29 April 2009.

/18/ THERMOCHEM: Non-Condensable Gases' (NCG) reports related to the monitoring period. The analysis results provided by Thermochem were issued as follows:

- 1st analysis results, issued on 16 October 2007, refers to samples taken on 10 August 2007;
- 2nd analysis results, issued on 04 April 2008, refers to samples taken between 19 – 27 December 2007;
- 3rd analysis results, issued on 30 July 2008, refers to samples taken between 20 – 21 May 2008;
- 4th analysis results, issued on 12 November 2008, refers to samples taken on 02 September 2008.

/19/ Technical specification of the engines used for emergency stoppage (back-up) and for fire emergencies as power generators:

i) Emergency Generator Manufacturer: Perkins Engines Company Limited; Model: 1000 Series, 1006-6T;

ii) Fire Fighting System Manufacturer: John Deere; Model: Deere Diesel, 6068TF250, Power Tech.

/20/ Operation License (ME-016-2007), issued by Majority Market Administrator (Administrador del Mercado Mayorista), on 26 January 2007.

/21/ Environmental License (RES. N° 942-2005/CANV/KC), issued by the Guatemalan Ministry of environmental and Natural Resources (Ministério de ambiente y Recursos Naturales, Guatemala, C.A.) on 27 April 2007.

/22/ Annex 3 of EB 44 Meeting Report of CDM Executive Board: *Validation and Verification Manual (version 01).*

Available at: http://cdm.unfccc.int/EB/044/eb44_repan03.pdf

/23/ Approved Consolidated Methodology: ACM0002 –" Consolidated methodology for grid-connected electricity generation from renewable sources" – Version 6

/24/ ISEA3000 (Revised) Assurance Engagements other than Audits or Reviews of Historical Financial Information.
http://www.ifac.org/IAASB/ProjectHistory.php?ProjID=0008

/25/ ISO/FDIS 14064-3 "Greenhouse gases – Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions and employed a risk-based approach.
http://www.iso.org/iso/en/CatalogueDetailPage.CatalogueDetail?CSNUMBER=38700ετscopelist=PROGRAMME

/26/ Voluntary Carbon Standard – VCS 2007: "*Voluntary Carbon Standard - Specification for the project-level quantification, monitoring and reporting as well as validation and verification of greenhouse gas emission reductions or removals*". Available at: http://www.v-c-s.org/documents.html

/27/ Voluntary Carbon Standard – VCS 2007: "*Program Guidelines, 19 November 2007*". Available at: http://www.v-c-s.org/documents.html

/28/ Voluntary Carbon Standard – VCS 2007: "*Policy Announcement from the VCS Association. Further Guidance for Projects that are Registered in Two GHG Programs, issued on 19 March 2008*". Available at: http://www.v-c-s.org/documents.html

/29/ Voluntary Carbon Standard – Project Description Template, 19 November 2007. Available at: http://v-c-s.org/docs/VCS%20PD.doc.

/30/ Letter of Approval for "Amatitlan Geothermal Project" issued on 22 November 2007 by the DNA of Guatemala. Available at:
http://cdm.unfccc.int/UserManagement/FileStorage/Y0KMCXR46O2LIJETZA5WB9DSGNHQ8V

Persons interviewed during the initial verification, or persons who contributed with other information that are not included in the documents listed above.

/31/ Miguel A. Galicia – Ortitlan Limitada – Plant Manager

/32/ Sayda D. Orozco – Ortitlan Limitada – Warehouse and Safety Official

/33/ Jose Ricardo Gill – Ortitlan Limitada – Operation Supervisor

/34/ Shalom Zivelin – Ormat – Product Support and Technical Manager

/35/ Joaquin Pereyra – Ecosecurities – Project Manager

/36/ Mauro Fadda – Ecosecurities – Verification Manager

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APPENDIX A

VERIFICATION CHECKLIST

Verification Checklist

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
A. Opening Session			
A.1. Introduction to audits	/3/	Ortitlan Ltd. and EcoSecurities Group Plc have commissioned Det Norske Veritas Certification AS (DNV) to carry out the verification and VCU certification of voluntary emission reductions generated by the Amatitlan Geothermal Project and reported for the period from 10 February 2007 to 11 December 2008 according to Voluntary Carbon Standard (VCS) 2007. This report contains the findings from the verification and a VCU certification statement for the voluntary emission reductions.	OK
A.2. Contractors for equipment and installation works *Who has installed the equipment? Who was contracted for planning etc.?*	/3/	The origin of the technology for main generating equipment is from an Israeli affiliate of Ormat Technologies, Inc., which is a U.S. company. Some components of the power plant were imported from Europe and other countries. The topping module consists of a 1.2 MW back-pressure steam turbine imported from Kato Engineering of Minnesota, U.S. The electricity is generated by the synchronous type Brush generator that the two Ormat Energy Converter (OEC) units, which use an Organic Rankine Cycle to convert the heat of the brine, are connected to, were imported from the Netherlands.	OK
A.3. Actual status of installation works *Project installation should be finished at time of initial verification in so far as the project should be ready to generate emission reductions afterwards.*	/3/	The Amatitlan Geothermal Project developed by Ortitlan Ltd. is a geothermal power plant in the Department of Escuintla, in Guatemala. The total installed capacity of the project is 25.2 MW. The plant utilizes 3 turbines (being two with installed capacities of 12 MW each, and one at 1.2 MW) and has an annual average power generation of 162,000 MWh per annum. The purpose of the project is to utilize the geological resources of the Amatitlan Geothermal Field in a geothermal power plant to	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		generate renewable energy and dispatch it to the Guatemalan Grid ("SIN – Sistema Nacional Interconnectada" / Interconnected National System). The plant started operating on 10 February 2007. The electricity supplied to the grid is measured by INDE ("Instituto Nacional de Electrificación" / National Electrification Institute), which has signed a Power Purchase Agreement (PPA) with the plant.	
B. Implementation of the project *This part is covering the essential checks during the on-site inspection at the project's site, which is indispensably for an initial verification*			
B.1. Physical components *Check the installation of all required facilities and equipment as described by the PDD.*	/3/	See A.3	OK
B.2. Project boundaries *Check whether the project boundaries are still in compliance with the ones indicated by the PDD.*	/3/	The project is located at the Municipalities of San Vicente Pacaya, Amatitlan and Villa Canales, Guatemala. The exact location of the project is defined using GPS coordinates. These GPS coordinates are for the Amatitlan Geothermal Field: Longitude 14º 23' 00'' N - 14º 25' 00''N and Latitude 90º 35' 00''W - 90º 37' 00'' W. The project boundary is clearly defined as the site of the project activity as well as the system boundary which is defined as the Guatemalan grid system to which the project plant is connected by transmission lines.	OK
B.3. Monitoring and metering systems *Check whether the required metering*	/3/	The energy is measured by the calibrated instruments of INDE, the electricity company of Guatemala and the buyer of electricity,	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
systems have been installed. The meters have to comply with appropriate quality standards applicable for the used technology.		cross checked by Ortitlan Ltd. through the local instruments. The steam flow is measured by two Rosemount flow meters installed at the steam pipes. Steam analyses of Non-Condensable Gases' (NCG) are periodically monitored. Samples are delivered to an external laboratory, named Thermochem, to be analyzed and obtain, among other gases and parameters, CO_2 and CH_4 fractions of the steam flow.	
B.4. Data uncertainty *How will data uncertainty be determined for later calculations of emission reductions? Is this in compliance with monitoring and metering equipment?*	/3/	The BE is the product of the grid Emissions Factor (EF, expressed in tCO_2e/MWh) multiplied by the net electricity supplied by the geothermal project to the grid (MWh). The emission factor of Guatemalan grid was determined ex-ante as 0.646 tCO_2/MWh as defined in the registered CDM project activity. In case of Amatitlan Geothermal Project, the project emissions to be considered are: i) The fugitive carbon dioxide and methane emissions that are accounted due to the release of NCGs from the produced steam (PE_{steam}, expressed in tCO_2e). Therefore, the average mass fractions of carbon dioxide (W_{main_CO2}, expressed in percentage) and methane (W_{main_CH4}, expressed in percentage) in the produced steam, the global warming potential of methane (GWP_{CH4} = 21 tCO_2/tCH_4) and the mass of steam produced (M_{steam}, expressed in tones/month), also need to be considered, and; ii) The carbon dioxide emissions from fossil fuel combustion (PE_{FF}, expressed in tCO_2). Therefore, the sum of diesel consumption as fossil fuel (ΣF_{diesel}, expressed in tons of diesel/month) and the related	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		coefficient emission factor of diesel ($COEF_{diesel}$, expressed in tCO_2e/tdiesel), also need to be considered; iii) According to ACM0002 (Version 6) and the validation report of the registered PDD, there is no need to consider leakage in case of Amatitlan Geothermal Project.	
B.5. Calibration and quality assurance *Check how monitoring and metering systems are subject to calibration and quality assurance routines* *a) with installation* *b) during future operation*	/3/	DNV verified that the calibration of the electricity meters are assured by POWER MEASUREMENT and that the calibration of the steam flow meter are assured by ELVATRON S.A.. Copies of the calibration certificates of the steam flow meters /14/ and the power meters /15/ used in the project activity were provided by the project participants. An additional calibration certificate was issued, on 29 April 2009, by SEMELEC, S.A. /17/, which is a company hired by AMM (Administrador del Mercado Mayorista / Majority Market Administrator) for performing the verification of the power meters. AMM is the operative entity of INDE, which is the National Electrification Institute of Guatemala. According to the calibration certificate /17/, the main meter has a discrepancy of - 0.276%. The accuracy range accepted by the AMM is +/- 0.2% (between -0.2% and +0.2%), according to the regulatory norm "NCC-14". Therefore, this indicates that the main electricity meter has been measuring 0.076% less electricity. In terms of electricity and ERs, this is equal to 166,613 kWh not invoiced by Ortitlan Ltd and 107 emission reductions not claimed by Amatitlan Geothermal Project. Hence, DNV considers that, even considering that a discrepancy was identified in the main power meter, the impact of such divergence in the project activity	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		is considered conservative and, therefore, acceptable.	
B.6. Data acquisition and data processing systems *Check the eligibility of used systems.*	/3/	DNV was able to verify that Amatitlan Geothermal Project has automated control system, known as "SCADA", where the operation including the electricity generated, consumed and exported to the grid is continuously monitored, among several other parameters, such as: steam flow, steam temperature, steam pressure, status of operational equipments, etc. The electricity generated from renewable sources (geothermal) and dispatched to the grid is been continuously metered by revenue ION power meters. The metered data is sent via SCADA to the control room, where data is daily recorded digitally into hard disk and manually into logbooks. Every month the electronic data is downloaded and a monthly report is generated /7/, this report is submitted to Power Market Authority (Administrador del Mercado Mayorista [AMM]) for cross checking the information. Once the electricity dispatched to the grid is certified by AMM an invoice will be processed by Ortitlan Limitada. Copies of the logbooks ("Bitacoras") /11/ /13/ and invoices /4/ from February 2007 to November 2008 were provided by the project participants and assessed by DNV. As the invoices are issued after the end of every month, the internal database records are the support documents used for verify the net electricity dispatched to the grid for the period from the 1st to 11th of December 2008. The steam flow is measured by two Rosemount flow meters installed at the steam pipes. The flow meter tagged 2324 measures steam flow from wells "AMF 1" and "AMF 2", and the flow meter tagged 2412 from wells "AMF 5" and "AMF 6". Data is sent to the control room via SCADA. Manual readings are taken every hour at the control room, then daily and monthly reports are generated digitally and hardcopies (logbooks) are kept at the control room. The internal electronic records registered by	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		SCADA software are been utilized for working out monthly steam flows. For February 2007, in particular, there is no electronic information recorded regarding steam flow (tones/month). Emissions reductions and project emissions (from NCGs) calculation for February 2007 were adjusted based on the most conservative ratio obtained by the relation between the "total steam flow and the gross electricity generation (steam/kWh)". Values to obtain the referred ratio were based on data from the rest of the period, from 1st March 2007 to 11th December 2008. Calculations can be reviewed in the following spreadsheet: "171-Amatitlan_WB_2008Ver 4.xls (Raw Data)". The electricity generated during February 2007 was measured by the revenue electricity meters. Staff of the geothermal plant takes steam samples according to the ASTM E1675 – 95a Standard. Samples are delivered to an external laboratory to be analyzed and obtain CO_2 and CH_4 fractions of the steam flow. Steam analyses have been periodically accomplished. For the whole monitoring period, four steam analyses of Non Condensable Gas (NCG) emissions have been carried out. The average of the four NCG fractions was used in order to calculate project emissions. Copies of the Non-Condensable Gases' (NCG) reports /18/ were provided by the project participants. The project emissions based on fossil fuel (diesel) consumption from the fire-fighting system and the emergency generator were monitored and deducted from the gross emissions reductions. It is important to highlight that Amatitlan Geothermal Project makes use of its own electricity generated to run all the equipments of the power plant. In case of emergencies, stoppages or lack of energy, the power plant makes use of their emergency generator, fueled with diesel, or electricity from the	

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
		grid, whether necessary. During the site visit on 26 and 27 November 2008, DNV was able to check that the operators of the plant keep manual and electronic records of all stoppages of the plants. In addition, the electricity consumed by Amatitlan Geothermal Project from the grid is monitored by both Ortitlan and INDE. The amount of electric energy is monthly indicated in the invoices issued by Ortitlan to INDE and this amount of electricity is deducted from the total energy dispatched to the grid by Amatitlan Geothermal power plant. Therefore, DNV was able to verify that the emissions reductions of the project activity are indeed calculated only considering the net electricity exported to the grid, discounting the amount of electricity consumed from the grid by the geothermal power plant.	
B.7. Reporting procedures *Check how reports with relevance for the later determination of emission reductions will be generated*	/3/	*See B.6*	OK
B.8. Documented instructions *Check whether the personnel performing tasks with sensitivity for the monitoring of emission reductions have access and knowledge of documented instructions, forming a part of the project's management system.*	/3/	Gathering of the monitoring data and compilation of emission reduction calculation spreadsheets are simple tasks which and don't need more complex instructions.	OK
B.9. Qualification and training *Check whether the personnel performing tasks with sensitivity for the monitoring of emission reductions has the appropriate competences, capabilities and*	/3/	The operators have training on system control provided by Ortitlan Ltd.. The certificates were provided to DNV by the project participants during the site visit.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
qualifications to ensure the required data quality.			
B.10. Responsibilities *Check whether all tasks required to gather data and prepare a monitoring report with the necessary quality have been allocated to responsible employees.*	/3/	Data is collected according to well defined data collection procedures: i) Data of electricity exported is collected by the power plant operator and recorded in a daily report datasheet; ii) Monthly data is aggregated from daily report and the data is compared with the amount reported by INDE and the invoices are monthly issued to INDE. iii) Data is processed by the electronic data management system (SCADA) and it is used to calculate emission reductions and to produce the VCU monitoring report. The site visit at the Amatitlan Geothermal power plant confirmed that monitoring and reporting is carried out consistently and in line with established procedures. As all data is registered on both paper and electronic format and cross checked with electricity sale receipts issued by Comertitlan to INDE, the VCU monitoring report can easily be retrieved from these records.	OK
B.11. Troubleshooting procedures *Check whether there are possibilities of redundant data monitoring in case of having problems with the used monitoring equipment. Such procedures may reduce risks for the buyers of emission reductions (e.g. the Client)*		*Not applicable*	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
C. Internal Data *Identifying the internal GHG data sources and ways in which the data have been collected, calculated, processed, aggregated and stored should be part of initial verification to assess accuracy and reliability of the internal GHG data..*			
C.1. Type and sources of internal data *Acquire information on type and source of internal GHG data, which is used in calculations of emission reductions. E.g.." continuous direct measurements", "site-specific correlations", "periodic direct measurements", "use of models" and/or "use of default emissions factors".*	/3/	*See B.6*	OK
C.2. Data collection *How is data collected and processed? What are the means of quantifying emissions from the different data sources?*	/3/	*See B.6*	OK
C.3. Quality assurance *Does internal data collection underlie sufficient quality assurance routines?*	/3/	*See B.10*	OK
C.4. Significance and reporting risks *Assess the significance and reporting risks related to the different internal data sources. Potential reporting risks may be related to the calculation methods, accuracy of data sources and data*	/3/	The figures are consistently verified by two parties.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
collection and/or the information systems from which data is obtained. The significance of and risks associated with the data source indicate the level of verification effort required at a later stage.			
D. External Data *Especially for data of baseline emissions there might be the necessity to include external data sources. The access to such data and a proof of data quality should be part of initial verification. If it is deemed to be necessary, an entity delivering such data should be audited.*			
D.1. Type and sources of external data *Acquire information on type and source of external data, which is used in calculations of emission reductions*	/3/	*See B.10*	OK
D.2. Access to external data *How is data transferred? How can reproducibility of data set be ensured?*	/3/	*See B.10*	OK
D.3. Quality assurance *Does external data underlie any quality assurance routines?*	/3/	*See B.10*	OK
D.4. Emergency procedures *Are there any procedures which will be applicable if there is no access to relevant external data?*		*Not applicable*	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
E. Environmental and Social Indicators *A Monitoring Plan may comprise environmental and/or social indicators which could be necessary to monitor for the success of the project activity.*			
E.1. Implementation of measures *A project activity may demand for the installation of measures (e.g. filtering systems or compensation areas), which are exceeding the local legal requirements. A check of the implementation or realization of such measures should be part of the initial verification.*		*Not applicable*	OK
E.2. Environmental assessment *A project activity must comply with environmental legislation in the host country.* *The Installation, Operation and/or other equivalent Environmental Licenses should be assessed during the verification in order to confirm that the project activity has operated in accordance to the requirements of the environmental legislation in the host country.*		The Environmental License (RES. N° 942-2005/CANV/K C) /21/, was issued by the Guatemalan Ministry of Environmental and Natural Resources (Ministério de Ambiente y Recursos Naturales, Guatemala, C.A.) on 27 April 2007. It was thus confirmed that the project activity is in accordance to the requirements of the environmental legislation in the host country.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
F. Management and Operational System *In order to ensure a successful operation of a Client project and the credibility and verifiability of the ERs achieved, the project must have a well defined management and operational system.*			
F.1. Documentation *The system should be documented by manuals and instructions for all procedures and routines with relevance to the quality of emission reductions. The accessibility of such documentations to persons working on the project has to be secured.*	/3/	*See B.6.*	OK
F.2. Qualification and training *The system should describe the requirements on qualification and the need of training programs for all persons working on the emission reduction project. Performed training programs and certificates should be archived by the system.*	/3/	*See B.9.*	OK
F.3. Allocation of responsibilities *The allocation of responsibilities should be documented in written manner.*	/3/	*See B.10*	OK
F.4. Emergency procedures *The system should contain procedures which provide emergency concepts in case of unexpected problems with data access*		*Not applicable*	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
and/or data quality.			
F.5. Data archiving *The system should provide routines for the archiving of all data which is required for verifying the project's performance in the context of consecutive verifications.*	/3/	*See B.10*	OK
F.6. Monitoring report *The system includes procedures for the calculation of emission reductions and the preparation of the monitoring report.*	/3/	*See B.10*	OK
F.7. Internal audits and management review *The system includes internal control procedures, which allow the identification and solution of problems at an early stage.*	/3/	*See B.10*	OK
G. Policy Announcement from the VCS Association - Further Guidance for Projects that are Registered in Two GHG Programs *In case the project has been validated under the CDM, a further validation shall be completed of clauses 1.12, 1.13, 1.14, 8.1 and 8.2 of the VCS Project Description template (available at: http://v-c-s.org/docs/VCS%20PD.doc).*			
G.1. (Clause 1.12) Demonstration to confirm that the project was not implemented to create GHG	/2/	The project consists of a plant that generates renewable electricity to supply electricity to the grid. There are no GHG emissions created for the purpose of its subsequent removal. The proje ct therefore complies with clause 1.12 of the VCS	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
emissions primarily for the purpose of its subsequent removal or destruction.		Project Description Template.	
G.2. (Clause 1.13) Demonstration that the project has not created another form of environmental credit (for example renewable energy certificates). *If the project has created another form of environmental credit, the proponent must provide a letter from the program operator that the credit has not been used and has been cancelled from the relevant program.*	/2/	There is no other environmental credit system other than CDM in place in Guatemala. The project can therefore not generate other environmental credits than VERs or CERs. The project therefore complies with paragraph 1.13 of the VCS Project Description Template.	OK
G.3. (Clause 1.14) Project rejected under other GHG programs (if applicable): *Projects rejected by other GHG programs, due to procedural or eligibility requirements where the GHG program applied have been approved by the VCS Board; can be considered for VCU but project proponents for such a project shall:* • *clearly state in its VCS PD all GHG programs for which the project has applied for credits and why the project was rejected, such information shall not be deemed commercially sensitive information; and* • *provide the VCS verifier and Registry with the actual rejection document(s)*	/2/	The project design, its eligibility as CDM project activity and the correct application of the approved CDM baseline and monitoring methodology ACM0002 (Version 6) /23/ were all already validated by the DOE Det Norske Veritas Certification AS (DNV) and the project was on 12 December 2008 registered as CDM project activity with the reference number 2022. The validation opinion by DNV is that the "Amatitlan Geothermal Project" as described in the PDD of 25 April 2008 (version 7) /3/ meets all relevant UNFCCC requirements for the CDM and all relevant host country criteria and correctly applies the approved baseline and monitoring methodologies ACM0002 (Version 6). As emission reductions occur prior to the registration of the project as CDM project activity, these emission reductions can not be claimed as Certified Emission Reductions (CERs). The emission reductions are thus claimed as Voluntary Carbon Units (VCU) under the Voluntary Carbon Standard (VCS) 2007. This is in accordance to the eminent VCS Guidance for projects that are registered in two GHG programs. In addition, the DNA of Guatemala has provided confirmation that	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
including explanation; and • *have the project validated against VCS program requirements.*		the project assists in achieving sustainable development, through the Letter of Approval issued on 22 November 2007 /30/. The project has been successfully validated and approved by the DNA of Guatemala as a CDM project. The project did not apply for registration or issuance of emission reduction credits under any other GHG program. The clause 1.14 of the VCS Project Description Template is therefore not applicable to this project.	
G.4. (Clause 8.1) Proof of Title: *Provide evidence of proof of title through one of the following:* • *A legislative right;* • *A right under local common law;* • *Ownership of the plant, equipment and/or process generating the reductions/removals;* • *A contractual arrangement with the owner of the plant, equipment or process that grants all reductions/removals to the proponent* *Projects rejected by other GHG programs, due to procedural or eligibility requirements where the GHG program applied have been approved by the VCS Board; can be considered for VCU but project proponents for such a project shall:* • *clearly state in its VCS PD all GHG programs for which the project has applied for credits and why the project*	/2/	The emission reductions associated to the project activity belong to the project participant Ortitlan Ltd. that is the power plant owner and operator, as can be demonstrated by the document "ORT-No.15 Constitución de Unidad Económica" (ORT – Economic Unit Contract 15) /9/. The project therefore complies with clause 8.1 of the VCS Project Description Template.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
was rejected, such information shall not be deemed commercially sensitive information; and • *provide the VCS verifier and Registry with the actual rejection document(s) including explanation; and* • *have the project validated against VCS program requirements.*			
G.5. (Clause 8.2) Projects that reduce GHG emissions from activities that participate in an emissions trading program (if applicable): *Project proponents of projects that reduce GHG emissions from activities that:* • *are included in an emissions trading Program; or* • *take place in a jurisdiction or sector in which binding limits are established on GHG emissions;* *shall provide evidence that the reductions or removals generated by the project have or will not be used in the Program or jurisdiction for the purpose of demonstrating compliance. The evidence could include:* • *a letter from the Program operator or designated national authority that emissions allowances (or other GHG credits used in the Program) equivalent*	/2/	The project does not take place in a jurisdiction or sector in which binding limits are established on GHG emissions. Emission reductions achieved by this program do not limit the emissions of projects that take place in an emissions trading program. The clause 8.2 of the VCS Project Description Template is therefore not applicable to this project.	OK

OBJECTIVE	Ref.	COMMENTS	Concl.(incl FARs/CARs)
to the reductions/removals generated by the project have been cancelled from the Program; or national cap as applicable or; • *purchase and cancellation of GHG allowances equivalent to the reductions/removals generated by the project related to the Program or national cap.*			

APPENDIX B

CORRECTIVE ACTION REQUESTS AND FORWARD ACTION REQUESTS

Corrective Action Requests (CARs) from the current verification

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
CAR 1	The "gross electricity generation" data of some months of 2007, presented in the emissions reductions calculation spreadsheet and in the first version of the monitoring report of 26 November 2008, are inconsistent with the internal records found in the database of the project facilities, as verified during the site visit on 26-27 November 2008. DNV requests to project participants to adjust the emissions reductions calculation spreadsheet as well as the monitoring report using the internal database records, which are the most accurate, credible and official source of information to be used.	PP EcoSecurities adjusted the gross electricity generated in the Monitoring report and the workbook using the internal database. PP Ortitlan Ltd supplied reviewed data for the monitoring period from February 2007 to 11th December 2008 in the following files: "Power_ION_download_2007.rar" "Power_ION_download_nov07_dec07_year2008.rar". -Amatitlan_MTR1_DigiLog_2008.xls -Amatitlan_Logbook_Dec2008.pdf And summarized in: -Ortitlan Energy_production_REVIEWED.xls -Plant Data for VERS calculations_REVIEWED.xls Copies of the logbooks (bitacoras) were submitted to DOE on site.	DNV verified the additional documents provided by the project participants. Both monitoring report and the emissions reductions calculation spreadsheet were revised and are in accordance to internal database records and the invoices issued to INDE. In addition, data regarding the "gross electricity generation" and the "electricity consumed from the grid", for the period from 01 November 2008 to 11 December 2008, which is the last day before the project's registration as a CDM project activity, were also included in the referred documents and cross-checked. The first version of the monitoring report /1/ presented 107 730 emission reductions. After the correction, the revised monitoring report /2/ presented 104 344 emission reductions. Therefore, this ~~CAR 1~~ is considered closed.
CAR 2	The "net electricity generation" data of May and August of 2008, presented in the emissions reductions calculation spreadsheet and in the first version of the monitoring report of 26 November 2008, are	PP EcoSecurities adjusted net electricity generation in the Monitoring report and the workbook using the internal database. PP Ortitlan Ltd supplied reviewed data for the months requested by the DOE in the following files	DNV verified the additional documents provided by the project participants. Both monitoring report and the emissions reductions calculation spreadsheet were revised and are in accordance to internal database records and the

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
	inconsistent with the internal records found in the database of the project facilities, as verified during the site visit on 26-27 November 2008. DNV requests to project participants to adjust the emissions reductions calculation spreadsheet as well as the monitoring report using the internal database records, which are the most accurate, credible and official source of information to be used.	"Power_ION_download_2007.rar" "Power_ION_download_nov07_dec07_year2008.rar". And summarized in: -Ortitlan Energy_production_REVIEWED.xls -Plant Data for VERS calculations_REVIEWED.xls Copies of the logbooks (bitacoras) were submitted to DOE on site.	invoices issued to INDE. In addition, data regarding the "net electricity generation", for the period from 01 November 2008 to 11 December 2008, which is the last day before the project's registration as a CDM project activity, was also included in the referred documents and cross-checked. Therefore, this ~~CAR 2~~ is considered closed.
CAR 3	The "total steam flow" data used in the emissions reductions calculation spreadsheet and in the first version of the monitoring report of 26 November 2008, for the period from March 2007 to October 2008, are not in accordance to the internal records found in the database of the project facilities, as verified during the site visit on 26-27 November 2008. DNV requests to project participants to adjust the emissions reductions calculation spreadsheet as well as the monitoring report using the internal database records. For the period from March 2007 to June 2007, the internal manual records registered by the operators should be used (due to the lack of electronic records) and for the	PP EcoSecurities adjusted the total steam flow in the Monitoring report and the workbook using the internal database, log books and data from the SCADA system. PP Ortitlan Ltd supplied reviewed data for all the monitoring period in the following zipped files -Steam_2007.rar -Steam_2008.rar -Amatitlan_Steam_Dec2008.xls And summarized in: -Ortitlan Energy_production_REVIEWED.xls -Plant Data for VERS calculations_REVIEWED.xls Copies of the logbooks (bitacoras) were submitted to DOE on site.	DNV verified the additional documents provided by the project participants. Both monitoring report and the emissions reductions calculation spreadsheet were revised and are in accordance to internal database records (log books and data from the SCADA system). The steam flow is measured by two Rosemount flow meters installed at the steam pipes. Flow meter tagged 2324 measures steam flow from wells AMF 1 and AMF 2, and flow meter tagged 2412 from wells AMF 5 and AMF 6. Data is sent to the control room via SCADA. Manual readings are taken every hour at the control room, then daily and monthly reports are generated digitally and hardcopies (logbooks) are kept at the control room.

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
	period from July 2007 to October 2008, the internal electronic records registered in the SCADA software by the electronic measurement equipments/devices should be used. In addition, DNV requests copies of these internal manual records registered by the operators, known as "bitacoras", for the period from March 2007 to June 2007 and the internal electronic records registered in the SCADA software by the electronic measurement equipments/devices for the period from July 2007 to October 2008.		The internal electronic records registered by SCADA software are been utilized for working out monthly steam flows. The "total steam flow" data used in the emissions reductions calculation spreadsheet is obtained through the sum of the average values of steam flow, which is hourly measured by each of the two Rosemount flow meters (flow meters tagged 2324 and 2412), then, it is multiplied by 24 (hours per day) and again multiplied by the number of the days of each month, as described below: Total Steam Flow = (Average values of steam flow #2324 + Average values of steam flow #2412) x 24 x days/month. DNV cross-checked all internal data records and calculations regarding the "total steam flow" and concluded that the results are deemed conservative and appropriate. In addition, data regarding the "total steam flow", for the period from 01 November 2008 to 11 December 2008, which is the last day before the project's registration as a CDM project activity, was also included in the monitoring report and in the emissions

CAR ID	Corrective action request	Response by Project Participants	DNV's assessment of response by Project Participants
			reductions calculation spreadsheet. All this additional data was also cross-checked. Therefore, this ~~CAR 3~~ is considered closed.
CAR 4	Due to the lack of registered information regarding the "total steam flow" data used in February 2007, for the emissions reductions calculation, the referred data shall be revised and adjusted based on the highest value/ratio achieved of the relation between the "total steam flow" and the "gross electricity generation" for the remaining period from March 2007 to October 2008. This is conservative.	Data was revised and adjusted by PP EcoSecurities and the most conservative value/ratio was used to calculate the steam flow for February 2007 as can be reviewed in the excel file: Amatitlan_Workbook_2007-2008-2.xls (raw data)	Project participants provided the revised version of the Monitoring Report of 23 March 2009 and the emissions reduction calculation spreadsheet with the corrections requested. Data was revised and adjusted by project participants using the most conservative value/ratio of the relation between the "total steam flow" and the "gross electricity generation" for the remaining period from March 2007 to December 2008 in order to calculate the steam flow for February 2007. Therefore, ~~CAR 4~~ was closed.

Clarification Requests (CLs) from the current verification

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 1	DNV requests copies of the calibration certificates of the two flow meters and the two power meters used by the project activity.	Copies of these certificates were delivered to the DOE on site	Copies of the calibration certificates of the steam flow meters /14/ and the power meters /15/ /17/ used in the project activity were provided by the project participants. Therefore, ~~CL 1~~ is considered closed.

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
CL 2	DNV requests to project participants to provide the electronic file of the project emissions calculation spreadsheet related to the diesel consumption of the project activity during the monitoring period.	These files were submitted to the DOE by PP EcoSecuritues Amatitlan_DieselConsumption_2007-2008.xls	The project emissions calculation spreadsheet was provided by the project participants. Data and calculations were cross-checked with internal database records and are considered accurate and appropriate. Therefore, ~~CL 2~~ is considered closed.
CL 3	DNV requests to project participants to provide copies of the Environmental and Operation Licenses of the project activity, in order to demonstrate that the project has been operating in accordance to the regulatory laws of the host country.	Copies of these documents were submitted to DOE on site	Copies of the Environmental /21/ and Operation /20/ Licenses of the project activity were provided by the project participants. It was thus confirmed that the project activity is in accordance to the regulatory laws of the host country. Therefore, ~~CL 3~~ is considered closed.
CL 4	DNV requests to project participants to include in the monitoring report all the necessary assumptions, standard values, formulas, factors and/or definitions (including its references whenever applicable or necessary) used for the emissions reductions calculations.	PP had reviewed the Monitoring Report and included all necessary assumptions, formulas, factors and references used for the emission reductions calculation.	Project participants provided an updated monitoring report with complementary information, including all necessary assumptions, formulas, factors and references used for the emission reductions calculation. Therefore, ~~CL 4~~ is considered closed.
CL 5	DNV requests to project participants to provide copies of the internal manual records registered by the operators, known as "bitacoras", containing the gross energy reading data reported for the following months: Apr/07, May/07, Jul/07,	Copies of these documents of the referred months were delivered to the DOE on site	Copies of these documents for the referred months were provided by the project participants. Data was cross-checked and it is in accordance to internal database records. Therefore, ~~CL 5~~ is considered closed.

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
	Oct/07 and Dec/07.		
CL 6	DNV requests to project participants to provide copies of the technical specification regarding the specific consumption of diesel in the engines of the power generators used for emergency stoppage (back-up) and for fire emergencies.	Copies of these documents were delivered to the DOE on site	Copies of the technical specification of the engines /19/ used for emergency stoppage (back-up) and for fire emergencies as power generators, including the specific consumptions of diesel in these equipments, were provided by the project participants. The specific consumption values used for the calculation of the project emissions due to the use of diesel in the power engines are in accordance to the technical specification of the engines. Therefore, ~~CL 6~~ is closed.
CL 7	DNV requests to project participants to provide copies of the Non-Condensable Gases' (NCG) reports related to the monitoring period.	Copies of these reports were delivered to the DOE on site	Copies of the Non-Condensable Gases' (NCG) reports /18/ were provided by the project participants. Staff of the geothermal plant takes steam samples according to the ASTM E1675 – 95a Standard. Samples are delivered to an external laboratory, named Thermochem, to be analyzed and obtain, among other gases and parameters, CO_2 and CH_4 fractions of the steam flow. Steam analyses have been periodically accomplished. For the whole monitoring period, from 10 February 2007 to 11 December 2008, four steam analyses of Non Condensable Gas (NCG) emissions

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
			have been carried out. The average of the four NCG fractions is used in order to calculate project emissions. The CO_2 and CH_4 fractions of the steam flow presented in the analysis results provided by Thermochem were used as follows: - 1st analysis results, which refers to samples taken on 10 August 2007, were used for the period from February 2007 up to July 2007; - 2nd analysis results, which , refers to samples taken between 19 – 27 December 2007, were used for the period from August 2007 up to December 2007; - 3rd analysis results, which refers to samples taken between 20 – 21 May 2008, were used for the period from January 2008 up to July 2008; - A 4th analysis result, which refers to samples taken on 02 September 2008, were used for the period from August 2008 up to December 2008. Data and calculations were cross-checked with internal database records and are considered accurate and

CL ID	Clarification request	Response by Project Participants	DNV's assessment of response by Project Participants
			appropriate. Therefore, ~~CL 7~~ is considered closed.

Forward Action Requests (FARs) from the previous verification

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR #	As this is the first VCU verification, no Forward Action Request (FAR) was identified from the previous verification process.	Not applicable.	Not applicable.

Forward Action Requests (FARs) from the current verification

FAR ID	Forward action request	Summary of how FAR has been addressed in this reporting period	Assessment of how FAR has been addressed
FAR #	No forward action request was identified for the next verification process.	Not applicable.	Not applicable.

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