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Verification Report

Utilization of Coal Mine Methane at the Coal Mine named after A.F. Zasyadko Donetsk, Ukraine

Third Periodic JI Verification

Utilization of Coal Mine Methane at the Coal Mine named after A.F. Zasyadko in Ukraine

Report No. 1276184

February 19th, 2009

TÜV SÜD Industrie Service GmbH
Carbon Management Service
Westendstr. 199 - 80686 Munich - GERMANY

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Subject:	Third periodic JI verification (Fifth periodic verification according to TÜV SÜD VER+ Standard)
Executing Operational Unit:	TÜV SÜD Industrie Service GmbH Carbon Management Service Westendstr. 199 80686 Munich, Germany
Client:	Lease Enterprise "Coal Mine named after O.F. Zasyadko" Prospekt Zasyadko, Donetsk, 83054, Ukraine
Contract approved by:	Werner Betzenbichler
Report Title:	Third periodic JI verification (Fifth periodic verification according to TÜV SÜD VER+ standard) of: "Utilization of Coal Mine Methane at the Coal Mine named after A.F. Zasyadko", GHG mitigation project in Donetsk, Ukraine
Number of pages	20 (excluding cover page and annexes)

Summary:

The certification body "Climate and Energy" of TÜV SÜD Industrie Service GmbH has been ordered by Lease Enterprise "Coal Mine named after AO.F. Zasyadko" in Donetsk, Ukraine, to carry out the third periodic JI verification (Fifth periodic verification according to TÜV SÜD VER+ standard) of the project "Utilization of Coal Mine Methane at the Coal Mine named after A.F. Zasyadko".

The verifier confirms that the project is implemented and is running as planned and described in determined project design documents. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project does generate GHG emission reductions.

The verifier can confirm that the GHG emission reduction for the whole monitoring period is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the valid project baseline and monitoring, and its associated documents. Based on the information we have seen and evaluated we confirm the following statement:

Reporting period: from October 1, 2008 to December 31, 2008.

Verified emission in the above reporting period:

Baseline Emissions:	173,302 t CO_2
Project Emissions :	19,366 t CO_2
Emission Reductions:	**153,936 t CO_2**

Work carried out by:	Thomas Kleiser (Assessment Team Leader), Karin Wagner, Olena Maslova and Dr. Albert Geiger	**Internal Quality Control by:** Rachel Zhang

Abbreviations

Abbreviations that have been used in the report here:

AIE	Applicant Independent Entity
CAR	Corrective Action Request
CHP	Combined Heat and Power
CMM	Coal Mine Methane
DFP	Designated National Focal Point
ERU	Emission Reduction Unit
FAR	Forward Action Request
GHG	Greenhouse Gas
GWP	Global Warming Potential
IETA	International Emission Trading Association
IPCC	Intergovernmental Panel on Climate Change
IVC	Initial Verification Checklist
JI	Joint Implementation
KP	Kyoto Protocol
MP	Monitoring Plan
MVP	Monitoring and Verification Protocol
NMHC	Non Methane Hydrocarbons
PDD	Project Design Document
PPA	Power Purchase Agreement
PVC	Periodical Verification Checklist
TÜV SÜD	TÜV SÜD Industrie Service GmbH
UNFCCC	UN Framework Convention on Climate Change
VPS	Vacuum Pump Station
VVM	Validation and Verification Manual

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1 INTRODUCTION

Lease Enterprise "Coal Mine named after A.F. Zasyadko" in Donetsk, Ukraine has commissioned an independent verification by TÜV Industrie Service GmbH (TÜV SÜD) of the JI project "Coal Mine Methane at the Coal Mine named after A.F. Zasyadko" in Donetsk, Ukraine. The order comprises the third periodic verification of the JI project (fifth Periodic Verification of the project according to TÜV SÜD VER+ standard) and is related to emission reductions achieved during the 4th quarter of the year 2008.

Verification is the periodic independent review and ex post determination by the Designated Operational Entity / Independent Entity of the monitored reductions in GHG emissions during the defined verification period.

This report summarizes the findings of the JI verification of the 4th quarter of the year 2008. It is based on the Periodic Verification Report Template Version 3.0, December 2003, which is part of the Validation and Verification Manual (VVM) published by International Emission Trading Association (IETA).

This Verification consisted of a desk review of the project documents including the monitoring report and the associated calculation sheet (October 1st, 2008 - December 31th, 2008).

The results of the determination were documented by TÜV SÜD in the determination report: "Coal Mine Methane at the Coal Mine named after A.F. Zasyadko", Draft Final Determination Report No. 913421, rev. No. 2, dated March 29th, 2007 (and actualised on March 27th, 2008 in the context of uploading the project for approval as JI Track 2 project at JI-SC).

The second JI periodic verification report (monitoring period: 1st of July till 30th of September 2008, Report No. 1264102 from February 18th, 2009) indicated no forwarded requests with relevance for this verification.

The verification team consists of the following personnel:

Thomas Kleiser	TÜV SÜD Munich	Project Manager, Assessment Team Leader
Dr. Albert Geiger	TÜV SÜD Munich	Auditor, Technical expert
Karin Wagner	TÜV SÜD, Munich	GHG Auditor
Olena Maslova	TÜV SÜD, Munich	GHG Auditor

1.1 Objective

The objective of the periodic verification is to verify that actual monitoring systems and procedures are in compliance with the monitoring systems and procedures described in the monitoring plan; further more the periodic verification evaluates the GHG emission reduction data and ex-

press a conclusion with a high, but not absolute, level of assurance about whether the reported GHG emission reduction data is free of material misstatements; and verifies that the reported GHG emission data is sufficiently supported by evidence, i.e. monitoring records. During the periodic verification it also has to be assessed whether Forward Action Requests remaining from former verifications already have been solved or at least that there is a significant progress in solving these issues finally and that no major risks remain for the successful verification.

The verification shall consider both quantitative and qualitative information on emission reductions.

Quantitative data comprises the monitoring reports submitted to the verifier by the project entity. Qualitative data comprises information on internal management controls, calculation procedures, and procedures for transfer, frequency of emissions reports, review and internal audit of calculations/data transfers.

The verification is based on criteria set by UNFCCC, the Kyoto Protocol and JI as well as CDM modalities and procedures.

1.2 Scope

Verification scope is defined as an independent and objective review and ex post determination by the Designated Operational Entity of the monitored reductions in GHG emissions. The verification is based on the submitted monitoring report and the validated project design documents including its monitoring plan. The monitoring report and associated documents are reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations. TÜV SÜD has, based on the recommendations in the Validation and Verification Manual employed a risk-based approach in the verification, focusing on the identification of significant risks of the project implementation and the generation of ERUs.

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

The audit team has been provided with a Monitoring Report and underlying data records in January the 8th, 2008 (version 1.2), covering the period for generating emissions reductions from October 1st, 2008 to December 31th, 2008. This document serves as the basis for the assessment presented herewith.

A final revised Monitoring report (Version 2.6, dated February the 18th, 2009) was submitted at the end of the verification process and serves as basis for the final conclusion in this report.

Studying the existing documentation belonging to this project, it was obvious that the competence and capability of the audit team performing the verification has to cover at least the following aspects:

- Knowledge of Kyoto Protocol and the Marrakech Accords
- Environmental and Social Impact Assessment
- Knowledge of recent decisions by JI supervisory committee - http://ji.unfccc.int
- Quality assurance
- Technical aspects of coal mine methane capture and utilization in CHP plants and as fuel
- Monitoring technologies and concepts
- Political, economical and technical conditions in host country

According to these requirements TÜV SÜD has composed a project team in accordance with the appointment rules of the TÜV certification body "climate and energy":

Thomas Kleiser is the Assessment Team Leader of the project with a background in physics and meteorology. Till 31th of December 2008 he was head of the division CDM and JI at TÜV SÜD Industrie Service GmbH conducting more than 90 validations and verifications of CDM and JI projects. In this position he was responsible for validation, verification and certifications processes for GHG mitigation projects as well as trainings for internal auditors. Since 1st of January he is head of the "Certification Body" of TÜV SÜD.

Karin Wagner is an auditor in the "Carbon Management Service" department of TÜV SÜD Industrie Service GmbH in Munich, Germany. She holds a M.Sc. in geological sciences and has gathered experience in environmental consulting for the mining industry before joining TÜV SÜD. Karin Wagner specializes in the assessment of CDM / JI projects in the sector of mining/mineral production, waste handling and disposal as well as renewable energies.

Olena Maslova is an auditor in the "Carbon Management Service" department of TÜV SÜD Industrie Service GmbH in Munich, Germany. She is chemical engineer and host country expert for projects in Ukraine and Commonwealth of Independent States. Olena Maslova specializes in the assessment of CDM / JI projects in the sector of chemical industries and waste handling and disposal.

Dr. Albert Geiger is a GHG auditor for CO_2-emission reduction projects of the scopes 8, 10 and 13 at the department "Environmental Service" of TÜV SÜD. He has done more than 15 CDM and JI projects and holds a PHD in geological sciences and does environmental consulting at TÜV SÜD since 1999.

The audit team covers the above mentioned requirements as follows:

- Knowledge of Kyoto Protocol and the Marrakech Accords (ALL)
- Environmental and Social Impact Assessment (ALL)
- Knowledge of recent decisions by JI supervisory committee (ALL)
- Quality assurance (Kleiser)
- Technical aspects of coal mine methane capture and utilization in CHP plants and as fuel (Kleiser)
- Monitoring technologies and concepts (ALL)
- Political, economical and technical conditions in host country (Maslova, Kleiser, Geiger)

Responsibility for the internal quality control of the project was Rachel Zhang, member of the certification body "climate and energy" within TÜV SÜD.

1.3 GHG Project Description

The purpose of this project is the avoidance of methane emissions into the atmosphere at Leasing Company "the Coal Mine named after A.F. Zasyadko", further referred to the Zasyadko mine or simply the mine.

Coal Mine Methane, drained and recovered in the operating mine works and from mine ventilation works, as well as methane produced by surface goaf wells at Zasyadko Mine, are **used to produce electricity** for mine works and the public grid (if there is a surplus); to **replace heat** currently produced by coal- and gas-fired boilers, including municipal boilers; and to **produce gas** for use as vehicle fuel.

The implementation status of the project in the verification period was as follows:

- Production of electricity and heat at the Vostochnaya site of the mine(12 CHPs)
- Utilisation of methane as vehicle fuel (Automobile Gas Filling Compressor Plant)

The on-site audit has been carried out on 16th of January, 2009. Audit participants on the part of Zasyadko Coal Mine were:

- Boris Bokiy; Deputy General Director of Zasyadko Coal Mine and responsible for the monitoring plan
- Yevgeniy Beresovskiy, CHP Director at Zasyadko Coal Mine
- Vyacheslav Kozyrenko, CHP Technical Director at Zasyadko Coal mine
- Maksim Myinka, Chief dispatch
- Valery Cherednikov, Monitoring engineer
- Vasiliy Natarin - Director gas filling station (AGFCP)

Technical Translator for German, English, Russian and Ukrainian on behalf of the mine:

- Alexander Posternikov

Participant at the audit on the part of Global Carbon BV was:

- Valery Sade, project manager
- Lennard De Klerk, director

Participants at the on-site audit on the part of TÜV SÜD

- Dr. Albert Geiger, GHG auditor
- Karin Wagner, GHG auditor
- Olena Maslova, GHG auditor

2 METHODOLOGY

In order to ensure transparency a verification checklist (VC) has been prepared based on the received documents (see Annex 1) according to the VVM.

These checklists serve the following purposes:

- it organizes details of the audit procedure and clarifies the requirements the project is expected to meet; and
- it documents the result of the verification.

During the verification a special focus was given to:

- the correct implementation of the project (installations, monitoring equipment and procedures, quality assurance procedures)
- the correctness of assumptions with impacts on the monitoring and verification process (e.g. baseline assumptions)
- sustainable development and environmental performance parameters
- training programs
- allocation of responsibilities
- the day-to-day operation of the system

After the document review the audit team conducted

- an on-site inspection at the coal mine gas assessing the CMM capture and utilization system
- interviews with the members of the owner and operator and the project developer responsible for writing the monitoring report

The findings are the essential part of this verification report, which is based on the verification protocol of the VVM. The structure of the tables in the periodic verification protocol is shown in the following:

Periodic Verification Checklist Table 1: Data Management System/Controls		
Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table.	A score is assigned as follows: **Full** all best-practice expectations are implemented. **Partial** a proportion of the best practice expectations is implemented **Limited** this should be given if little or none of the system component is in place.	Description of circumstances and further commendation to the conclusion. This is either acceptable based on evidence provided (**OK**)**,** or a **Clarification Request (CR)** in case the information given in the monitoring report ids deemed insufficient but correct or a **Corrective Action Request (CAR)** of risk or non-compliance with stated requirements. The corrective action requests are numbered and presented to the client in the Verification report. The Initial Verification has additional Forward Action Requests (FAR). FAR indicates essential risks for further periodic verifications

Periodic Verification Checklist Table 2: GHG calculation procedures and management control testing		
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
Identification of potential reporting risks based on an assessment of the emission estimation procedures.	Identification of the key controls for each area with potential reporting risks. Assessment of adequacy of the key controls and eventually test that the key controls are actually in operation.	Identification of areas of residual risks, i.e. areas of potential reporting risks where there are no adequate management controls to mitigate potential reporting risks
Identification of key source data. Focus on those risks that impact the accuracy, completeness and consistency of	Internal controls include, Understanding of responsibilities and roles, Reporting, reviewing and formal management approval of data;	Areas where data accuracy, completeness and consistency could be improved are highlighted.

Periodic Verification Checklist Table 2: GHG calculation procedures and management control testing		
Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
the reported data.	Procedures for ensuring data completeness, conformance with reporting guidelines, maintenance of data trails etc.	

Periodic Verification Checklist Table 3: Detailed audit testing of residual risk areas and random testing		
Areas of residual risks	**Additional verification testing performed**	**Conclusions and Areas Requiring Improvement (including *FARs*)**
List of residual areas of risks of Periodic Verification Checklist Table 2 where detailed audit testing is necessary. *In addition, other material areas may be selected for detailed audit testing.*	*The additional verification testing performed is described. Testing may include:* ▪ *Sample cross checking of manual transfers of data* ▪ *Recalculation* ▪ *Spreadsheet 'walk throughs' to check links and equations* ▪ *Inspection of calibration and maintenance records for key equipment* ▪ *Check sampling analysis results* *Discussions with process engineers who have detailed knowledge of process uncertainty/error bands.*	*Having investigated the residual risks, the conclusions are noted here. Errors and uncertainties are highlighted.*

Four CARs were encountered during the verification process. These CARs could be solved during the verification process.

CRs appear whenever

- Given information in the monitoring report was deemed to be insufficient.

Three CRs have been identified and solved during this verification process.

Furthermore FARs (Forward Action Requests) for a better understanding can be issued, whenever

- the current status requires a special focus on this item for the next consecutive verification, or
- an adjustment of the MVP is recommended
- more detailed information appears a beneficial to the project
- QM procedures are available but should be collected in one central document (QM Manual).

No Far has been issued.

Duration of the verification

Preparations: January 2009

On-site verification: 16th of January

Monitoring Period:

From October 1st, 2008 to December 31th, 2008

2.1 Review of Documentation and Site Visits

The verification was performed as a desk review of the project documents including monitoring plan, last verification report, monitoring report (from October 1st , 2008 to December 31th, 2008) and further documentations.

The site visit included an on-site inspection at the coal mine with focus on the methane capture and utilization system, further a focus on the QM system (mainly data processing, work instructions etc.), interviews with the management as well as operators and workers and with a representative of the project developer, Dutch company Global Carbon BV.

2.2 Resolution of Corrective and Forward Action Requests

The objective of this phase of the verification was to resolve the corrective action request which needed to be clarified for TÜV SÜD`s positive conclusion on the GHG emission reduction calculation. Quality and accuracy of the data and documents presented during the on site visit was high

and therefore only four minor CARs and three CRs had to be reported. To guarantee the transparency of the verification process, the requests raised and responses that have been given are summarized in chapter 3 below and documented in more detail in the verification protocol in annex 1.

3 PERIODIC VERIFICATION FINDINGS

In the following sections the findings of the verification are stated. The verification findings for each verification subject are presented as follows:

The findings from the desk review of the final monitoring report and the findings from interviews during the follow up visit are summarized. A more detailed record of these findings can be found in the Verification Protocol in annex 1.

1) Where TÜV SÜD had identified issues that needed clarification or that represented a risk to the fulfilment of the project objectives, a Clarification Request or Corrective or Forward Action Request, respectively, have been issued. The Clarification Requests as well as Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in annex 1. The verification of the project resulted in four Corrective Action Requests and three Clarification Requests.
2) In the context of Forward Action Requests, risks have been identified, which may endanger the delivery of high quality ERUs in the future, i.e. by deviations from standard procedures as defined by the MP. 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. Forward Action Requests are understood as recommendation for future project monitoring; they are stated, where applicable, in the following sections and are further documented in the Verification Protocol in annex 1.
3) The final conclusions for verification subject are presented.

The verification findings relate to the project implementation as documented and described in the final monitoring report.

3.1 Remaining issues, CARs, FARs from the last verification

3.1.1 Discussion

One task of third periodic verification is to check remaining issues from the previous verification or issues which are clearly defined for assessment in the PDD.

3.1.2 Findings

None

3.1.3 Conclusion

TÜV SÜD confirms that there are no open FARs from previous verifications.

3.2 Completeness of Monitoring

3.2.1 Discussion

All monitoring parameters described in the Monitoring Report have been checked against the Monitoring Plan of the approved PDD. It can be stated by TÜV SÜD that the monitoring has been carried out in accordance with the monitoring plan. All parameters were monitored and determined as per the Monitoring Plan.

The monitoring data of the monitoring period were stored electronically according to the approved PDD and handed over to the audit team during the on-site visit. The data sets reflect continuous measurements by the meters as required by the registered project. Additionally, handwritten data books were presented.

3.2.2 Findings

OBJECTIVE	COMMENTS	Concl.
Monitoring	**Corrective Action Request 2:** The monitoring report should include a clear description of the overall project activity including the different utilization methods of the extracted gas (section A.3). The correct versions of the applied tools should be mentioned (A.5.1). The formulas and equations applied in order to calculate the baseline emission, project emissions as well as overall emission reductions should be clearly presented in the report. The relations between the parameters and the meters should be clearly shown. The procedure regarding the internal power consumption as well as the external power supply (import, export) should also be made transparent in the report. It should also be clearly indicated which meter is used as a cross-check or back-up meter and which meter is actually used to calculate the ERUs. The temperature and pressure transmitter associated with the flow meters should be added to the equipment list.	Section A.3. has been revised. The description clearly describes the present situation. The version numbers of the tools have been inserted. The relation between variables monitored (electricity, heat, gas) and the actual meters has been described in the relevant section B.1.2. including cross-checking. Temperature and pressure sensors (transmitters) were included in the meter overviews. ☑
Monitoring	**Clarification Request 3:** Less information is provided for electricity meters compared to Q3 MR: no manufacturer, no uncertainty lever, no beginning and end meter reading. Page 6, footnote 8 & 9 are mixed up and one is missing, at least compared to Q3. Special Event Log (B.4): Please revise according to Q3.	The omissions were corrected in the latest MR. ☑

3.2.3 Findings

The monitoring report is transparent and complete. The status of the project is clearly described in chapter A.3. All parameters and formulae mentioned in the PDD are described in detail (chapter B and D). The relationship between meters and parameters is clearly demonstrated. All me-

ters are unambiguously identified by their serial numbers and ID numbers. The location of the meters is shown on overviews or is described. The calibration specifications are clearly shown.

Hence, TÜV SÜD confirms that the monitoring as described in the monitoring report complies fully with the monitoring plan of the approved PDD.

3.3 Accuracy of Emission Reduction Calculations

3.3.1 Discussion

For metering only calibrated meters have been used according to our check of the calibration documents (see 2.4 till 2-6 of the document list). Inspection of calibration and maintenance records for key equipment was performed for all relevant meters. All calibrations fulfil the calibration requirements of the Ukraine and the approved PDD (see also CR1 below).

The raw data have been checked randomly using data from secondary meters and written meter values of the logbooks. The values used in the calculation file (excel file) have been checked against the raw data. No errors have been detected.

All default values used in the calculations have been checked against the approved PDD. The values fully comply with the PDD default values.

All calculations of the emission reductions have been done according to the formulae of the registered PDD using Microsoft excel. The correctness of the calculations has been checked by TÜV SÜD during the on-site visit in doing exemplary recalculations. Due to the approved methodology there is no need to make corrections for data uncertainty.

3.3.2 Findings

OBJECTIVE	COMMENTS	Concl.
Calculation	**Corrective Action Request No. 3:** Please justify why formula 10 and not formula 11 of the PDD has been used for calculating $BE_{use,el,y}$. Please insert PC_{CH4} into the excel sheet as indicated in the PDD.	The justification is clearly shown in the latest version of the MR. Because PC_{NMHC} is less than 1 % PC_{CH4} is not relevant. ☑
Calibration	**Clarification Request 1:** Please explain how you think the discrepancy between the accuracy of the gas flow meters indicated in the PDD (1-2%) and on the calibration records (2.5%) has been taken into account.	Additional documents of the calibration institute have been provided showing that the accuracy of the flow meters is less than 1 %. ☑

3.3.3 Conclusion

The settled Car and CR have been answered sufficiently

TÜV SÜD confirms that:

- **the applied raw data are accurate**
- **the emission reduction calculations are transparent and correctly done according to the Monitoring Plan of the approved PDD.**
- **the Monitoring Report fully complies with the approved PDD concerning the accuracy of the calculations.**

3.4. Quality of Evidence to Determine Emission Reductions

3.4.1 Discussion

The calculation of emission reductions was based on internal data (the external grid emission factor was fixed ex-ante). The origin of those data was explicitly checked.

The external grid emission factor finally needs to be approved by the Ukrainian DFP.

The entering and processing of the data and the used excel sheets were checked, where predefined algorithms compute the annual value of the emission reductions. All equations and algorithms used in the different workbook sheets follow the methodology and were checked successfully.

The manual transfer of data was checked on a random basis and spot checks. No mistakes have been detected.

The observations of the auditing team left no doubt that the monitoring process, defined in the Monitoring Plan and the Monitoring Manual, has been followed and is being followed completely.

3.4.2 Findings

None.

3.4.3 Conclusion

TÜV SÜD confirms that the project complies fully with the JI requirements in respect to the quality of evidence.

3.5 Management System and Quality Assurance

3.5.1 Discussion

The monitoring activities are strictly organised and written down in the Monitoring Manual. The responsibilities are determined and quality assurance measures are implemented on-site. The clear distribution of the monitoring duties has been demonstrated by the staff during the on-site visit.

However, the Monitoring had to be improved according to the following CARs and CR.

3.5.2 Findings

The findings are summerised in the following table:

OBJECTIVE	COMMENTS	Concl.
Quality Assurance	**Corrective Action Request No. 1:** The monitoring report should include an outline of the persons who were in charge of the monitoring responsibilities, and the reporting of the measured data during the given monitoring period including the names of the responsible persons. Any changes from the last monitoring period should be well documented. Performed training sessions should also be presented in a more detailed manner (topics, dates, etc.).	Names of responsible persons were included (see sections A.10 and C.1.1. of the MR). The training section (C.1.2. of the MR) has been revised ☑
Documentation	**Corrective Action Request No. 4 (identical with FAR2 and FAR3 of the last verification):** Internal control procedures should be included in more detail in the monitoring manual. In addition, the procedures for the periodic internal verification of the data and the calculations of the GHG reductions including cross-check measures should be transparently described in the manual using a step-by-step approach.	The monitoring manual has been revised according to the CARs (see also 3.1 of this report). ☑
Documentation	**Clarification Request 2 (resulting from FAR4 of last verification):** Please provide TÜV SÜD with a list with the applied programs and codes for the automated data monitoring system (IT system) that were observed and checked on various computers during the on-site visit (See also FAR4 of last verification). Data protection measures should be demonstrated. A summary of the testing procedures performed on the IT system should be included in the manual.	The monitoring manual has been revised according to the CARs see also 3.1 of this report). ☑

3.5.3 Conclusion

The two CARs and the CR have been solved. Due to the straightforward approach for calculating GHG emission reductions the existing management system is assessed to be appropriate and the quality assurance is on a high level guaranteed.

Hence, TÜV SÜD confirms that the project complies fully with the approved PDD concerning the Management System and the QAS.

4. PROJECT SCORECARD

The conclusions on this scorecard are based on the latest version of the monitoring report.

Risk Areas		Conclusions			Summary of findings and comments
		Baseline Emissions	Project Emissions	Emission Reductions	
Completeness	Source coverage/ boundary definition	✓	✓	✓	All relevant sources are covered by the monitoring plan and the boundaries of the project are defined correctly and transparently.
Accuracy	Physical Measurement and Analysis	✓	✓	✓	State-of-the-art technology is applied in an appropriate manner. Appropriate back-up solutions are provided.
	Data calculations	✓	✓	✓	Emission reductions are calculated correctly.
	Data management & reporting	✓	✓	✓	Data management and reporting were found to be satisfying. Potential for improvement is indicated by 4 FARs.
Consistency	Changes in the project	✓	✓	✓	Results are consistent to underlying raw data.

5 VERIFICATION STATEMENT

TÜV SÜD Industrie Service GmbH has performed the third periodic JI verification (fifth periodic verification according to TÜV SÜD VER+ standard) of the project "Utilization of Coal Mine Methane at the Coal Mine named after A.F. Zasyadko".

The verification is based on requirements of the UN Framework Convention on Climate Change (UNFCCC). In this context, the relevant documents are the "Marrakech Accords" and the recent rules and regulations as well as guidance given by JI-Supervisory committee.

The management of Zasyadko Coal Mine is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the document "Monitoring Report; period 1st of October up to 31th of December 2008" (Global Carbon B.V., final document version 2.6, dated February 18th, 2009).

The verifier confirms that the project is implemented as planned and described in the validated project design document. Installed equipment being essential for generating emission reduction and for metering the data defined in the monitoring plan runs reliably and is calibrated appropriately. The monitoring system is in place and works correctly and the project generates GHG emission reductions according to the approved methodology.

The verifier can confirm that the GHG emission reduction is calculated without material misstatements for the whole monitoring period.

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

Based on the information we have seen and evaluated, we confirm the following statement:

Reporting period: from October 01, 2008 to December 31, 2008.

Verified emission in the above reporting period:

Baseline Emissions:	173,302 t CO_2
Project Emissions:	19,366 t CO_2
Emission Reductions:	**153,936 t CO_2**

Munich, February 19h, 2009

Thomas Kleiser
Project Manager

Munich, February 19th, 2009

Rachel Zhang
Deputy Head of certification body Climate and Energy"

Table 1: Data Management System/Controls

The project operator's data management system/controls are assessed to identify reporting risks and to assess the data management system's/control's ability to mitigate reporting risks. The GHG data management system/controls are assessed against the expectations detailed in the table. A score is assigned as follows:

- Full - all best-practice expectations are implemented.
- Partial - a proportion of the best practice expectations is implemented
- Limited - this should be given if little or none of the system component is in place.

Expectations for GHG data management system/controls	Score	Verifiers Comments (including *Forward Action Requests*)
1. Defined organisational structure, responsibilities and competencies		

1.1. Position and roles *Position and role of each person in the GHG data management process is clearly defined and implemented, from raw data generation to submission of the final data. Accountability of senior management must also be demonstrated.*	Partial	The responsibilities and authorities for monitoring and reporting are in accordance with the responsibilities and authorities stated in the monitoring plan. The GHG data management process is clearly defined and the staff is totally aware and also fully capable of their positions and associated tasks. **Corrective Action Request No. 1:** The monitoring report should include an outline of the persons who were in charge of the monitoring activities, and the reporting of the measured data during the given monitoring period including the names of the responsible persons. Any changes from the last monitoring period should be well documented. Performed training sessions should also be presented in a more detailed manner (topics, dates, etc.).
1.2. Responsibilities *Specific monitoring and reporting tasks and responsibilities are included in job descriptions or special instructions for employees.*	Full	The responsibilities are clearly defined and described in the actual monitoring manual. The interviewed employees were fully aware of their tasks and responsibilities.

1.3. *Competencies needed* *Competencies needed for each aspect of the GHG determination process are analysed. Personnel competencies are assessed and training programme implemented as required.*	Full	The competencies for each aspect of the GHG determination process have been thoroughly checked. Experiences in implementation of monitoring concepts at the Zasyadko Coal Mine as well as in development of monitoring reports at Global Carbon BV and at the side of DBT in providing and installing the monitoring equipment provider guarantee a high level of competence. The competencies of the involved companies and persons in the monitoring team could be demonstrated equally well. Meanwhile gathered high level generic experience with methane utilisation (at Zasyadko Coal Mine) is available as well as detailed knowledge of the CHPs and their operational monitoring process. Global Carbon BV has comprehensive knowledge in developing PDDs for JI projects as well as developing monitoring reports for such projects. DBT is the responsible company for monitoring the pure methane consumption at the CHPs and has also long-term experiences in monitoring emissions from coal mine exploration in Western European countries. Several trainings were performed throughout 2008, which could be well documented and demonstrated during the site visit in January 2009. Hence the minimum requirement of the forward action request 1 from the second verification (i.e. annual training) is fully met.
2. The Conformance with monitoring plan		

2.1. Reporting procedures *Reporting procedures should reflect the monitoring plan content. Where deviations from the monitoring plan occur, the impact of this on the data is estimated and the reasons justified.*	Partial	The monitoring plan presents the monitoring concept on a rather high level. The reporting procedures are described in the emission monitoring manual (version 2, updated on January 7, 2009). **Corrective Action Request 2:** The monitoring report should include a clear description of the overall project activity including the different utilization methods of the extracted gas (section A.3). The correct versions of the applied tools should be mentioned (A.5.1). The formulas and equations applied in order to calculate the baseline emission, project emissions as well as overall emission reductions should be clearly presented in the report. The relations between the parameters and the meters should be clearly shown. The procedure regarding the internal power consumption as well as the external power supply (import, export) should also be made transparent in the report. It should also be clearly indicated which meter is used as a cross-check or back-up meter and which meter is actually used to calculate the ERUs. The temperature and pressure transmitter associated with the flow meters should be added to the equipment list.

2.2. Necessary Changes *Necessary changes to the monitoring plan are identified and changes are integrated in local procedures as necessary.*	Partial	All required metering systems have been identified and checked during the on-site visits. The monitoring and metering equipment has been described in detail in the monitoring manual and report, inclusive calibration dates and calibration frequencies. **Clarification Request 1:** Please explain how you think the discrepancy between the accuracy of the gas flow meters indicated in the PDD (1-2%) and on the calibration records (2.5%) has been taken into account.
3. Application of GHG determination methods		
3.1. Methods used *There are documented description of the methods used to determine GHG emissions and justification for the chosen methods. If applicable, procedures for capturing emissions from non-routine or exceptional events are in place and implemented.*	Full	The method to determine GHG emissions is fully documented (however, see CAR2). Procedures for capturing emissions from exceptional events (steam trap failures, start / stops etc) are extensively covered. Back-up procedures in case of meter failures exist and are described in the manual.
3.2. Information/process flow *An information/process flow diagram, describing the entire process from raw data to reported totals is developed.*	Full	An overall flow diagram has been developed and inserted into the actual emission monitoring manual.

3.3. Data transfer *Where data is transferred between or within systems/spreadsheets, the method of transfer (automatic/manual) is highlighted - automatic links/updates are implemented where possible. All assumptions and the references to original data sources are documented.*	Partial	The data transfer process has been widely automated in order to avoid transfer failures. All data sources are clearly referenced. The transfer of the data is explained in the monitoring manual. **Clarification Request 2:** Please provide TÜV SÜD with a list with the applied programs and codes for the automated data monitoring system (IT system) that were observed and checked on various computers during the on-site visit. Data protection measures should be demonstrated. A summary of the testing procedures performed on the IT system should be included in the manual.
3.4. Data trails *Requirements for documented data trails are defined and implemented and all documentation are physically available.*	Full	All documents with the primary data are available and all primary data which were retrieved on a random basis could be confirmed. No meters were replaced during the given monitoring period. Primary data are directly entered into the workbook sheets, without any in-between steps.
4. Identification and maintenance of key process parameters		
4.1. Identification of key parameters *The key physical process parameters that are critical for the determination of GHG emissions (e.g. meters, sampling methods) are identified.*	Full	Yes, all key parameters are identified. This could further be verified during the site visit.

4.2. Calibration/maintenance *Appropriate calibration/maintenance requirements are determined.*	Full	The calibration documents of all monitoring meters have been checked. Result: All calibration / maintenance requirements are met. However, the electricity meters are not completely described **Clarification Request 3:** Less information is provided for electricity meters compared to Q3 MR: no manufacturer, no uncertainty lever, no beginning and end meter reading. Page 6, footnote 8 & 9 are mixed up and one is missing, at least compared to Q3. Special Event Log (B.4): Please revised according to Q3.
5. GHG Calculations		

5.1. Use of estimates and default data *Where estimates or default data are used, these are validated and periodically evaluated to ensure their ongoing appropriateness and accuracy, particularly following changes to circumstances, equipment etc. The validation and periodic evaluation of this is documented.*	Full	Default values (either IPCC or data locally acquired as boiler efficiency, fuel consumption of the vehicles and grid factor) already have been described in the PDD and have been confirmed in the determination report. No additional estimates or default data have been used during the verification period nor does the monitoring concept foresee the use of such data. Formula 10 of the PDD has been used for calculating $BE_{use,el,y,}$ However, it has not been shown that the electricity generated by the project activity was less than the total amount of electricity consumed by the mine. **Corrective Action Request No. 3:** Please justify why formula 10 and not formula 11 of the PDD has been used for calculating $BE_{use,el,y}$. Please insert PC_{CH4} into the excel sheet as indicated in the PDD.
5.2. Guidance on checks and reviews *Guidance is provided on when, where and how checks and reviews are to be carried out, and what evidence needs to be documented. This includes spot checks by a second person not performing the calculations over manual data transfers, changes in assumptions and the overall reliability of the calculation processes.*	Partial	In the monitoring manual version 2 (dated 07.01.2009) the quality assurance issue is still only partially described, although the whole procedure was discussed during the on-site visit. Hence the forward action requests 2 of the last report remain still open: **Corrective Action Request No. 4:** Internal control procedures should be included in more detail in the monitoring manual. In addition, the procedures for the periodic internal verification of the data and the calculations of the GHG reductions including cross-check measures should be transparently described in the manual using a step-by-step approach.

5.3. Internal verification *Internal verifications include the GHG data management systems, to ensure consistent application of calculation methods.*	Full	According to the on-site findings the internal control procedures are in general working well. The methods to calculate the GHG reductions appear to be consistently applied. No anomalies were observed. The internal control procedures were included in the revised monitoring manual in section V.
5.4. Internal validation *Data reported from internal departments should be validated visibly (by signature or electronically) by an employee who is able to assess the accuracy and completeness of the data. Supporting information on the data limitations, problems should also be included in the data trail.*	Full	The reported data is checked and transferred from daily spreadsheet into monthly spreadsheets by the assigned staff. Interviews, discussions and on-site checks on-site confirmed that the responsible persons are fully qualified for these tasks.
5.5. Data protection measures *Data protection measures for databases/spreadsheets should be in place (access restrictions and editor rights).*	Full	In the new emission monitoring manual some data protection measures are described in detail. However, see CR2.
5.6. IT systems *IT systems used for GHG monitoring and reporting should be tested and documented.*	Partial	In the latest monitoring manual the IT systems are only described rudimentary. See CR2.

Table 2: GHG calculation procedures and management control testing

Identification of potential reporting risk	Identification, assessment and testing of management controls	Areas of residual risks
Failure of the monitoring meters	Errors because of technical failure or insufficient calibration are possible.	All monitoring meters are controlled permanently from the control room. The meters are calibrated according to the requirements of the manufacturer by external organisations. Hence, a severe failure of the monitoring meters is rather unlikely.
Failure in data collection and management.	Failures because of incorrect computer handling or incorrect data input are possible.	The computers are handled by specialists. The data input is mostly automatically. Hence, errors in data collection and management are unlikely.
Errors in calculation	Errors because of wrong data input or false formulae are possible	The calculation spreadsheets have been checked. The input of the data is done by an expert. Hence the risk of calculation errors is considered to be low.

Table 3: Detailed audit testing of residual risk areas and random testing

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Human mistakes in measurements and data processing	During the on-site visit the persons involved in the data acquisition process have been interviewed and asked concerning their role and competencies, furthermore they had to describe the procedures for which they are responsible.	All interviewed staff showed competence and has been trained well. The data management is widely done automatically. Hence, human mistakes in measurements and data processing are very unlikely.
Random testing of the data and calculations	• Sample cross checking of transfers of data: All data which were used in the Excel sheet of the calculation file were explicitly checked. On a random basis data were checked at their primary source.	The data files have been checked on the basis of primary data. No errors have been found. Hence, data errors are very unlikely.
	• Re-calculation Recalculation of the workbook files was performed.	The done calculation has been checked random wise. No errors have been found.
	• Spreadsheet 'walk throughs' to check links and equations All equations and algorithms used in the different workbook sheets were checked.	
	• Inspection of calibration and maintenance records for key equipment The seals and the documents for the key equipment were inspected.	The calibration of all monitoring meters has been checked. For all meters valid calibration protocols have been delivered. Hence, severe calibration errors are unlikely (however see CR1).

Areas of residual risks	Additional verification testing performed	Conclusions and Areas Requiring Improvement (including *Forward Action Requests*)
Uncommon events	Uncommon events are described in the logbooks.	Uncommon events are documented. However, the document procedures should be described in detail in the monitoring manual (see CAR above).

Table 4: Compilation of open issues

Corrective and Forward Action Requests by audit team	Summary of project owner response	Audit team conclusion
Corrective Action Request No. 1: The monitoring report should include an outline of the persons who were in charge of the monitoring activities, and the reporting of the measured data during the given monitoring period including the names of the responsible persons. Any changes from the last monitoring period should be well documented. Performed training sessions should also be pre-sented in a more detailed manner (topics, dates, etc.).	Names of responsible person for this monitoring period were included. Refer please section A.10 and sections C.1.1. Recently performed trainings were included in section C.1.2.	The request is sufficiently answered. ☑
Corrective Action Request 2: The monitoring report should include a clear description of the overall project activity including the different utilization methods of the extracted gas (section A.3). The correct versions of the applied tools should be mentioned (A.5.1). The formulas and equations applied in order to calculate the baseline emission, project emissions as well as overall emission reductions should be clearly presented in the report. The relations between the parameters and the meters should be clearly shown. The procedure regarding the internal power consumption as well as the external power supply (import, export) should also be made transparent in the report. It should also be clearly indicated which meter is used as a cross-check or back-up meter and which meter is actually used to calculate the ERUs. The temperature and pressure transmitter associated with the flow meters should be added to the equipment list.	A description of the overall project activity was included in section A.3. The version numbers of the tools were included in section A.5. The formulae where included in section D. The relation between the variables monitored (electricity, heat and gas) and the actual meters was clearly described in the relevant section B.1.2 including some cross-checking. Temperature and pressure sensors (transmitters) were included in the meter overviews. ID numbers to all meters were added and indicated in the Figures	Section A.3. has been revised. The description clearly describes the present situation. The version numbers of the tools have been inserted. The relation between variables monitored (electricity, heat, gas) and the actual meters has been described in the relevant section B.1.2. including cross-checking. Temperature and pressure sensors (transmitters) were included in the meter overviews. The request is sufficiently answered. ☑

Corrective and Forward Action Requests by audit team	Summary of project owner response	Audit team conclusion
Corrective Action Request No. 3: Please justify why formula 10 and not formula 11 of the PDD has been used for calculating $BE_{use,el,y}$. Please insert PC_{CH4} into the excel sheet as indicated in the PDD.	In accordance with the monitoring plan it has first been checked whether the net electricity generated at the CHP is larger or smaller than the net electricity consumption of the mine. Actually $GEN_{CHP}<EL_{cons}$. Further details have been included in section B.1.2. PC_{NMHC} concentration is less than 1% for this monitoring period (measurements were provided) and has been excluded. Therefore PC_{CH4} is an irrelevant factor as well and has been excluded in the calculations. Also refer to relevant notes in section D.1 of the MR.	The request is sufficiently answered. ☑
Corrective Action Request No. 4 : Internal control procedures should be included in more detail in the monitoring manual. In addition, the procedures for the periodic internal verification of the data and the calculations of the GHG reductions including cross-check measures should be transparently de-scribed in the manual using a step-by-step approach.	Internal control procedures, both for data control and MR control, have been included in the Monitoring Manual (MM). Cross-check procedures were included as well.	The monitoring manual has been revised according to the CARs (see also 3.1 of this report). ☑
Clarification Request 1: Please explain how you think the discrepancy between the accuracy of the gas flow meters indicated in the PDD (1-2%) and	The calibration records show an uncertainty of 1% for a range in which the CHP-unit can operate which is in line	Additional documents of the calibration institute have been provided showing that the accuracy of the

Corrective and Forward Action Requests by audit team	Summary of project owner response	Audit team conclusion
on the calibration records (2.5%) has been taken into account.	with the PDD. Refer to the calibration certificates provided where the 1% uncertainty is confirmed for gas flows of the (operating) range 1000-5000 m3 per annum. Only for very low gas flows (lower than 250m^3 on an annual basis) the uncertainty is 2.5%. However, such low flow does not occur as a CHP-unit would not be able to operate being undersupplied with fuel gas. The uncertainty and accuracy are equal.	flow meters is less than 1 %. ☑
Clarification Request 2 : Please provide TÜV SÜD with a list with the applied programs and codes for the automated data monitoring system (IT system) that were observed and checked on various computers during the on-site visit. Data protection measures should be demonstrated. A summary of the testing procedures performed on the IT system should be included in the manual.	The list with the applied programs and codes for the automated data monitoring system (IT system) that were observed and checked on various computers during the on-site visit (See also FAR4 of last verification) will be submitted as separate document. Please refer to the Monitoring Manual version 2.3 chapter V. A summary of the testing procedures performed on the IT system was included in the manual.	The monitoring manual has been revised according to the CAR (see also 3.1 of this report). ☑
Clarification Request 3: Less information is provided for electricity meters compared to Q3 MR: no manufacturer, no uncertainty lever, no beginning and end meter reading.	Omission were corrected.	The MR has been correctly revised. ☑

Corrective and Forward Action Requests by audit team	Summary of project owner response	Audit team conclusion
Page 6, footnote 8 & 9 are mixed up and one is missing, at least compared to Q3. Special Event Log (B.4): Please revise according to Q3.		

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Category 1 Documents:

Documents provided by the Client that relate directly to the GHG components of the project. These have been used as direct sources of evidence for the initial verification conclusions.

1-1	PDD "Utilisation of Coil Mine Methane at the Coil Mine named after A. F. Zasyadko", Version 04, 02/02/2007, Global Carbon B. V.
1-2	JI Monitoring Report Version 1.2 from 8th of January 2009, Global Carbon B. V.
1-3	JI Monitoring Report Version 2 from 27th of January, 2009, Global Carbon B. V.
1-4	JI Monitoring Report Version 2.2 from 3rd of February, 2009, Global Carbon B. V.
1-4.1	JI Monitoring Report Version 2.3 from, 4th of Feburary, 2009, Global Carbon B. V.
1-4.2	JI Monitoring Report Version 2.4 from 13th of February, 2009, Global Carbon B. V.
1-4.3	JI Monitoring Report Version 2.5 from 17th of February, 2009, Global Carbon B. V.
1-5	JI Monitoring Report Version 2.6 from 18th of February, 2009, Global Carbon B. V.
1-6	Excel spread sheet with the calculation of the emission reductions, 8th of January 2009
1-6.1	Excel spread sheet with the calculation of the emission reductions version 2.5, 17th of February 2009, Lease Enterprise Mine named after A. F. Zasyadko
1-7	Logbook of CHP unit concerning of volume of mining gas, 01/10-31/12/2008, Lease Enterprise Mine named after A. F. Zasyadko
1-8	Amount of generated electricity according to electric meters, 01/10-31/12/2008, Lease Enterprise Mine named after A. F. Zasyadko
1-9	Volume of the heat meter SA94/2 for October till December 2008, Lease Enterprise Mine named after A. F. Zasyadko
1-10	Computer tables of electricity amount, gas consumption and methane content, 01/10-31/12/2008, Lease Enterprise Mine named after A. F. Zasyadko
1-11	Amount of electricity production, ignition gas and AGFCP for the period 01/10-31/12/2008, Lease Enterprise Mine named after A. F. Zasyadko
1-12	The input data for calculation of emission reductions, 01/10-31/12/2008. Lease Enterprise Mine named after A. F. Zasyadko
1-13	Handwritten data books
1-14	Confirmation of electricity consumption at Zasyadko coal mine for the period October-December 2008, issued by chief power engineer of Zasyadko coal mine
1-15	Reports of quarterly NMHC analysis for 2008

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Category 2 Documents:

Background documents related to the design and/or methodologies employed in the design or other reference documents. These documents have been used to cross-check project assumptions and confirm the validity of information given in the Category 1 documents and in verification interviews.

2-1	Approved consolidated baseline methodology ACM0008 "Consolidated baseline methodology for coal bed methane, coal mine methane and ventilation air methane capture and use for power (electrical or motive) and heat and/or destruction by flaring or catalytic oxidation", ACM0008 – Version 04, 15.10.2007, UNFCCC
2-2	Tool for the demonstration and assessment of additionality, Version 05, 16/05/2008, UNFCCC
2-3	Clarification regarding the public availability of documents under the verification procedure under the Joint Implementation Supervisory Committee (version 03)
2-4	Calibration documents for gas analyzers at vacuum pumping stations, shown on-site
2-5	Calibration documents for the flow meters, shown on-site
2-6	Calibration documents for the electricity meters, shown on-site
2-7	Information about the research institute "Respirator", which is responsible authority for calibration works
2-8	List of equipment that will be calibrated in 2009 by research institute "Respirator"
2-9	Passports for electricity meters incl. transformation coefficients
2-10	List of software incl. description for data collection, calculation and reporting implemented at CHP
2-11	Emission Monitoring Manual for Mine name after A. F. Zasyadko, 2008,. Lease Enterprise Mine named after A. F. Zasyadko, version 2.3 from January 28th, 2009
2-12	Excel calculation sheets, Lease Enterprise Mine named after A. F. Zasyadko
2--13	List of CHP staff, Lease Enterprise Mine named after A. F. Zasyadko
2-14	Vacation plan of CHP staff in 2008, Lease Enterprise Mine named after A. F. Zasyadko
2-15	Logbook of CHP staff working hours in 2008, Lease Enterprise Mine named after A. F. Zasyadko
2-16	Documentation of the daily works at CHP in 2008, Lease Enterprise Mine named after A. F. Zasyadko

2-17	Trainings conducted at coal mine in 2008, Lease Enterprise Mine named after A. F. Zasyadko
2-18	Calculation of the flow rate of all CHP-units, 5th of February 2009
2-19	Calibration reports of the flow meters, 18th of July 2008