VERIFICATION REPORT

INSTITUTE FOR ENVIRONMENT AND ENERGY CONSERVATION LTD

VERIFICATION OF THE INSTALLATION OF A NEW WASTE HEAT RECOVERY SYSTEM IN ALCHEVSK COKE PLANT, UKRAINE

THIRD PERIODIC FOR 2011

(01 JANUARY 2011 – 31 DECEMBER 2011)

REPORT NO. UKRAINE/0409/2011

REVISION NO. 01

BUREAU VERITAS CERTIFICATION

Date of first issue:	Organizational unit:
19/03/2012	Bureau Veritas Certification Holding SAS
Client:	**Client ref.:**
Institute for Environment and Energy Conservation	Vasyl Vovchak

Summary:

Bureau Veritas Certification has made the 3 periodic verification of the project "Installation of a new waste heat recovery system in Alchevsk Coke Plant, Ukraine" project of Institute for Environment and Energy Conservation, located in town Alchevsk, Lugansk region, Ukraine, and applying the methodology ACM0012 version 03.1, on the basis of UNFCCC criteria for the JI, as well as criteria given to provide for consistent project operations, monitoring and reporting. UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

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

The first output of the verification process is a list of Clarification, Corrective Actions Requests, Forward Actions Requests (CL, CAR and FAR), presented in Appendix A.

In summary, Bureau Veritas Certification confirms that the project is implemented as per determined changes. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions. The GHG emission reduction is calculated without material misstatements, and the ERUs issued totalize: 198 775 tonnes of CO_2 equivalent for the monitoring period from 01/01/2011 to 31/12/2011.

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

Report No.:	Subject Group:
UKRAINE-ver/0409/2011	JI

Project title:
"Installation of a new waste heat recovery system in Alchevsk Coke Plant, Ukraine"

Work carried out by:
Rostislav Topchiy – Team Leader, Lead Verifier
Vitaliy Minyaylo – Team Member, Verifier
Elena Mazlova – Team Member, Specialist

Work reviewed by:
Ivan Sokolov – Internal Technical Reviewer

Work approved by:
Ivan Sokolov – Operational Manger

Bureau Veritas Certification Holding SAS

Date of this revision:	Rev. No.:	Number of pages:
19/03/2012	01	30

☒ No distribution without permission from the Client or responsible organizational unit

☐ Limited distribution

☐ Unrestricted distribution

Table of Contents *Page*

1 INTRODUCTION 3
1.1 Objective 3
1.2 Scope 3
1.3 Verification Team 3

2 METHODOLOGY 4
2.1 Review of Documents 4
2.2 Follow-up Interviews 4
2.3 Resolution of Clarification, Corrective and Forward Action Requests 5

3 VERIFICATION CONCLUSIONS 6
3.1 Remaining issues and FARs from previous verifications 6
3.2 Project approval by Parties involved (90-91) 6
3.3 Project implementation (92-93) 6
3.4 Compliance of the monitoring plan with the monitoring methodology (94-98) 9
3.5 Revision of monitoring plan (99-100) Not applicable 11
3.6 Data management (101) 11
3.7 Verification regarding programmes of activities (102-110) Not applicable 13

4 VERIFICATION OPINION 13

5 REFERENCES 15

APPENDIX A: VERIFICATION PROTOCOL 20

1 INTRODUCTION

Institute for Environment and Energy Conservation has commissioned Bureau Veritas Certification to verify the emissions reductions of its JI project “Installation of a new waste heat recovery system in Alchevsk Coke Plant, Ukraine" (hereafter called “the project”) at town Alchevsk, Lugansk region, Ukraine.

This report summarizes the findings of the verification of the project, performed on the basis of UNFCCC criteria, as well as criteria given to provide for consistent project operations, monitoring and reporting.

1.1 Objective

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

The objective of verification can be divided in Initial Verification and Periodic Verification.

UNFCCC criteria refer to Article 6 of the Kyoto Protocol, the JI rules and modalities and the subsequent decisions by the JI Supervisory Committee, as well as the host country criteria.

1.2 Scope

The verification scope is defined as an independent and objective review of the project design document, the project’s baseline study, monitoring plan and monitoring report, and other relevant documents. The information in these documents is reviewed against Kyoto Protocol requirements, UNFCCC rules and associated interpretations.

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

1.3 Verification Team

The verification team consists of the following personnel:

Topchiy Rostislav
Bureau Veritas Certification Team Leader, Climate Change Lead Verifier

Minyaylo Vitaliy
Bureau Veritas Certification, Team Member, Climate Change Verifier

Elena Mazlova
Bureau Veritas Certification, Team Member, Technical Specialist

This verification report was reviewed by:

Ivan Sokolov
Bureau Veritas Certification, Internal Technical Reviewer

2 METHODOLOGY

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

In order to ensure transparency, a verification protocol was customized for the project, according to the version 01 of the Joint Implementation Determination and Verification Manual, issued by the Joint Implementation Supervisory Committee at its 19 meeting on 04/12/2009. The protocol shows, in a transparent manner, criteria (requirements), means of verification and the results from verifying the identified criteria. The verification protocol serves the following purposes:

- It organizes, details and clarifies the requirements a JI project is expected to meet;
- It ensures a transparent verification process where the verifier will document how a particular requirement has been verified and the result of the verification.

The completed verification protocol is enclosed in Appendix A to this report.

2.1 Review of Documents

The Monitoring Report (MR) submitted by "Institute for Environment and Energy Conservation" and additional background documents related to the project design and baseline, i.e. country Law, Project Design Document (PDD), Approved CDM methodology and/or Guidance on criteria for baseline setting and monitoring, Host party criteria, Kyoto Protocol, Clarifications on Verification requirements to be checked by an Accredited Independent Entity were reviewed.

The verification findings presented in this report relate to the:

- Annual Monitoring report for the period 01/01/2011 – 31/12/2011 version 01 dated 20/01/2012 and Annual Monitoring report for the period 01/01/2011 – 31/12/2011 version 02 dated 20/02/2012;
- Project as described in the determined PDD.

2.2 Follow-up Interviews

On 01/02/2012 Bureau Veritas Certification performed on-site interviews with project stakeholders to confirm selected information and to resolve

issues identified in the document review. Representatives of "Institute for Environment and Energy Conservation" and PJSC "ALCHEVSK BY-PRODUCT COKE PLANT" (PJSC "ALCHEVSKKOKS") were interviewed during site visit (see References for the list of interviewed persons). The main topics of the interviews are summarized in Table 1.

Table 1 Interview topics

Interviewed organization	Interview topics
PJSC "ALCHEVSKKOKS"	➢ Organizational structure. ➢ Responsibilities and authorities. ➢ Training of personnel. ➢ Quality management procedures and technology. ➢ Implementation of equipment (records). ➢ Metering equipment control. ➢ Metering record keeping system, database.
Institute for Environment and Energy Conservation	➢ Baseline methodology. ➢ Monitoring plan. ➢ Monitoring report. ➢ Deviations from PDD.

2.3 Resolution of Clarification, Corrective and Forward Action Requests

The objective of this phase of the verification is to raise the requests for corrective actions and clarification and any other outstanding issues that needed to be clarified for Bureau Veritas Certification positive conclusion on the GHG emission reduction calculation.

If the Verification Team, in assessing the monitoring report and supporting documents, identifies issues that need to be corrected, clarified or improved with regard to the monitoring requirements, it should raise these issues and inform the project participants of these issues in the form of:

(a) Corrective action request (CAR), requesting the project participants to correct a mistake that is not in accordance with the monitoring plan;

(b) Clarification request (CL), requesting the project participants to provide additional information for the Verification Team to assess compliance with the monitoring plan;

(c) Forward action request (FAR), informing the project participants of an issue, relating to the monitoring that needs to be reviewed during the next verification period.

The Verification Team will make an objective assessment as to whether the actions taken by the project participants, if any, satisfactorily resolve

the issues raised, if any, and should conclude its findings of the verification.

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

3 VERIFICATION CONCLUSIONS

In the following sections, the conclusions of the verification are stated.

The findings from the desk review of the original monitoring documents and the findings from interviews during the follow up visit are described in the Verification Protocol in Appendix A.

The Clarification, Corrective and Forward Action Requests are stated, where applicable, in the following sections and are further documented in the Verification Protocol in Appendix A. The verification of the Project resulted in 04 Corrective Action Requests, 04 Clarification Requests.

The number between brackets at the end of each section corresponds to the DVM paragraph (see references).

3.1 Remaining issues and FARs from previous verifications

It was verified the implementation of corrective action to FAR 01 from the previous verification. Corrective actions were not implemented. Verification team issued a Corrective Action Requests (CAR 01).

3.2 Project approval by Parties involved (90-91)

Written project approval by Japan and Ukraine has been issued by the DFP of that Party when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest.

The abovementioned written approval is unconditional.

3.3 Project implementation (92-93)

The JI project at PJSC “ALCHEVSKKOKS” Lugansk Region, Ukraine envisaged implementation of a new waste heat recovery system based on installation of Coke Dry Quenching facility (CDQ facility), 75 t/h highly-efficient boiler firing coke-oven gas (COG) and blast-furnace gas (BFG) and also installation of 9,13 MWe captive electricity generator together with steam turbine.

Before the project implementation PJSC “ALCHEVSKKOKS” was using conventional Coke Wet Quenching (CWQ) technology at batteries 5, 6, 7, 8 and 9-bis for coke quenching. In 2006 the coke battery 10-bis was launched in order to increase manufacturing capacity of the Plant. Additional coke battery 10-bis required installation of other quenching facility. In order to upgrade coke production technology to produce high quality coke the management of PJSC “ALCHEVSKKOKS” decided to install the CDQ facility. CDQ facility was set up to quench coke from battery 10-bis and partly from 9-bis. In comparison with CWQ technology, the CDQ technology has such major advantages: it is environmentally capable and more energy efficient.

Project implementation leads to GHG emission reductions.

Emission reductions are achieved due to (1) displacement of natural gas consumption that would have been burnt at the steam generators according to the baseline of the project, (2) displacement of grid electricity consumption by installation of captive electricity generator for own electricity production and (3) reduction of coke input per unit of pig iron production at the blast furnaces of Alchevsk Iron and Steel Works (AISW), by producing high-quality coke at CDQ facility.

In summary, the project activity comprises three components of GHG emissions reductions as follows:

1. GHG emissions reductions due to dismissing natural gas that would have been burnt at the baseline boilers for steam generation by installing CDQ waste heat recovery technology together with high-efficient boiler;

2. GHG emissions reductions due to replacing grid electricity by installing the power generator with CDQ waste heat recovery technology together with high-efficient boiler by improving the efficient use of COG and BFG;

3. GHG emissions reductions due to reducing coke input per unit of pig iron production at the blast furnace by installing CDQ waste heat recovery technology.

Other than GHG emissions the project activity entails significant environmental co-benefits. While CDQ enables PJSC “ALCHEVSKKOKS” to utilize waste heat and promote energy conservation, it also reduces emissions of air pollutants such as nitrogen oxides (NOx) and particulates from CWQ, boilers, and grid-connected power plants by replacing natural gas burning and grid electricity. In addition, the reduction of coke consumption at the blast furnace contributes to resource conservation.

According to the PDD, version 7 from 22/12/2009, the project envisaged the following basic stages of project implementation:

- Stage 1: Installation of CDQ facility (35 t/h of dry coke output x 3 boilers);
- Stage 2: Installation of steam generator firing BFG and COG (75 t/h of steam output);
- Stage F: Installation of 9,13 MWe captive electricity generator.

Stage 1 was completed on 30th of September 2007.

Stage 2 was completed in the beginning of year 2011.

Stage F was completed in the beginning of October 2011.

The delay in project implementation plan was caused by financial and other factors such as construction delay etc.

According to PDD version 07, emission reductions during 2011 monitoring period were expected 253735 tonnes of CO_2 equivalent. According Monitoring Report version 02 emission reductions achieved are 198775 tonnes of CO_2 equivalent.

Delay of stage F completion caused some insignificant deviations in comparison with monitoring plan in PDD. Basically, delay of stage F increased the level of baseline emissions.

Together with this deviation occurred regarding steam transportation method to the grid of the plant. In PDD it was envisaged that the total volumes of steam will be transported to the grid of the plant with high pressure of 40 atm, enthalpy = 790 kcal/kg, but actually in 2011 some portions of steam was transported with low pressure of 6 atm, enthalpy = 685 kcal/kg.

Also the level emission reductions from dry coke consumption at the blast furnaces of AISW was calculated (in PDD) based on estimated volumes of dry coke consumption and coke quality indicators. So when emission reductions from dry coke consumption were calculated (in the monitoring report) in accordance with actual data, a decrease of actual emission reductions from dry coke consumption was observed.

Such mentioned above deviations caused decrease of actual emission reductions in comparison with the level of emission reductions that are stated in the PDD.

The project leads to increase of energy efficiency, which reduces consumption of fuel and energy resources per output unit, and

improvement of the environment due to introduction of state-of-art equipment with environmentally friendly technologies.

In conventional CWQ technology, the sensible heat of the hot coke from the coke-making process is emitted into the atmosphere in the form of steam during quenching. Also CWQ is a source of dust pollution to the surroundings. Hence, CDQ facility reduces noxious emissions of air pollutants such as nitrogen oxides (NOx), carbon monoxides (CO), sulfur dioxides (SO_2). CDQ technology also leads to a decrease of sewage waters, and therefore of dust, carbon oxides, ammonia, hydrogen sulfide, phenol, cyanic hydrogen emissions which would have been emitted during CWQ facility operation. In addition, the reduction of coke consumption at the blast furnaces contributes to reduction of harmful substances.

The identified areas of concern as to Project implementation, project participants response and BV Certification's conclusion are described in Appendix A Table 2 (refer to CL 01, CL 02).

3.4 Compliance of the monitoring plan with the monitoring methodology (94-98)

The monitoring occurred in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website.

For calculating the emission reductions, key factors, such as Fraction of total heat generated by the project activity using waste energy, Total amount of electricity generated in the project activity, Amount of electricity self-consumed by CDQ, Average amount of electricity generated in the most recent three years prior to the project activity, CDQ system operation hours, Average operating hours of existing captive power generators in the most recent three years prior to the project activity, The CO_2 emission factor for the electricity source, national electricity grid, displaced due to the project activity, Output/intermediate energy that can be theoretically produced, to be determined on the basis of maximum recoverable energy from the Waste Energy Carrying Medium (WECM), which would have been released (or WECM would have been flared or energy content of WECM would have been wasted) in the absence of JI project activity, Amount of steam generated in CDQ boiler in the project activity, Specific enthalpy of steam generated in CDQ boiler in the project activity, Specific enthalpy of feed water in CDQ boiler in the project activity, Specific enthalpy of feed water in CDQ boiler in the project activity, The CO_2 emission factor per unit of energy of natural gas in the baseline used in the existing boiler used by PJSC "ALCHEVSKKOKS" in absence of the project activity, Efficiency of the existing boiler that would have supplied heat to PJSC "ALCHEVSKKOKS"

in the absence of the project activity, Fraction of total heat that is used by PJSC “ALCHEVSKKOKS” in the project that in absence of the project activity would have been supplied by the existing boiler, Increased pig iron production due to dry coke input in a blast furnace, Decreased coke consumption due to dry coke input in a blast furnace, Index for coke hardness of coke produced in the baseline activity, Index for reduced coke abrasion for coke produced in the baseline activity, Index for reduced coke faction content over 80mm for coke produced the baseline activity, Total volume of coke consumed at blast furnaces, Index for coke hardness of coke produced in the project activity, Index for reduced coke abrasion for coke produced in the project activity, Index for reduced coke fraction content over 80mm for coke produced in the project activity, influencing the baseline emissions and the activity level of the project and the emissions as well as risks associated with the project were taken into account, as appropriate.

The monitoring equipment used for baseline and project emission calculation is present in the Annex 2 of Monitoring Report.

The Management and Operational System supporting GHG emission monitoring is a part of the company’s Quality Management System certified to ДСТУ ISO 9001:2009 (ISO 9001:2008).

The procedures of receiving data for monitoring and responsibility for its realization at PJSC “ALCHEVSKKOKS” are regulated by the normative documents of PJSC “ALCHEVSKKOKS” and by the “Guiding Meteorological Instructions” which are developed in accordance with ДСТУ ISO 9001:2009 (ISO 9001:2008).

Data are collected and stored in electronic database and in paper format. The data is reported in the monthly report of PJSC “ALCHEVSKKOKS” which are compiled into an annual monitoring report for verification process.

The Chief Metrological Specialists of PJSC “ALCHEVSKKOKS” is in charge of maintenance of the facility and monitoring equipment as well as of their accuracy. In case of defect, discovered in the monitoring equipment, the actions of the staff are determined in Guiding Metrological Instructions. The measurements are conducted constantly in accordance with national standards.

All measuring equipment is included in the verification schedule and verified with established periodicity. According to the schedule of verification, all devices are in satisfactory condition.

The measurement results are being used by the Chief power-engineering specialist department, by the following services and technical staff of the Plant. They are reflected in the technological instructions of production processes regime and also in the “Guiding Metrological Instructions” revised versions. The monitoring data and calculations are under the competence of the Chief power-engineering specialist assistants in accordance to the interior order of PJSC “ALCHEVSKKOKS”.

The documented instructions to operate the facilities are stored at the working places.

Monitoring Report provide sufficient information about the elements of the system related to assigning roles, responsibilities and authorities for implementation and maintenance of monitoring procedures including control of data. The verification team confirms effectiveness of this management system. The personnel responsible for monitoring are trained in an appropriate manner.

Data sources used for calculating emission reductions or enhancements of net removals, such as (plant records, Statistics of PJSC “ALCHEVSKKOKS”, “Ukraine – Assessment of new calculation of CEF” Annex 2 “Standardized emissions factors for the Ukrainian electricity grid, Management Directive, USSR Ministry of Ferrous Metallurgy, 1996 IPCC Guidelines for National Greenhouse Inventories) are clearly identified, reliable and transparent.

Emission factors, including default emission factors, are selected by carefully balancing accuracy and reasonableness, and appropriately justified of the choice.

The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner.

3.5 Revision of monitoring plan (99-100)

Not applicable.

3.6 Data management (101)

The data and their sources, provided in monitoring report, are clearly identified, reliable and transparent.

The monitoring at PJSC “ALCHEVSKKOKS” and AISW is conducted on monthly basis according to monitoring plan.

Two operational managers are in charge for monitoring of GHG emissions and ERUs and preparation of annual monitoring reports.

The data required to monitor the project are routinely collected within the normal operation of the Companies and therefore monitoring is also an integral part of routine monitoring. All data are collected into electronic database of the Companies. Data are complied in day-to-day records, monthly records and annual records.

The appropriate data for GHG monitoring are fed into the Monitoring Database.

The Project Developers are also supervising the implementation of the Monitoring Plan for the project at regular intervals.

The management of PJSC “ALCHEVSKKOKS” has organized appropriate staff training to operate the project equipment. Quality assurance and quality control training was conducted as well. Practical training programs will continue on-the-job during project operation.

The data and their sources, provided in monitoring report, are clearly identified, reliable and transparent.

The implementation of data collection procedures is in accordance with the monitoring plan, including the quality control and quality assurance procedures.

The function of the monitoring equipment, including its calibration status, is in order, but taking into account that the list of monitoring equipment was not in accordance with this monitoring period, the project developer has revised and updated it. The list of monitoring equipment is now in accordance with this specific monitoring period. Revision and update of the monitoring equipment was done by taking into account the following reasons:

1) some monitoring equipment were sent on scheduled or unscheduled verifications/calibrations and were replaced by another monitoring equipment (same type but other serial number);
2) some monitoring equipment were removed from the data accounting and data accounting was conducted on other equipment;
3) additional monitoring equipment was installed in order to monitor the same indicators;
4) after the monitoring equipment were removed from one accounting spot and after verifications/calibrations were conducted, the monitoring equipment were installed at the other accounting spot for data accounting;
5) monitoring equipment were changed on another and sent in order to conduct repairing works;
6) the list of monitoring equipment was improved in comparison with the list for the previous monitoring period by taking into account all inaccuracies that were made in the past.

All facts of monitoring equipment substitution are reflected in the internal journals of monitoring equipment substitution.

In case of having problems with certain monitoring equipment, the accounting system is organized in such way that allows double checking of all the data.

The evidence and records used for the monitoring are maintained in a traceable manner.

The data collection and management system for the project is in accordance with the monitoring plan.

The identified areas of concern as to Data management, project participants response and BV Certification's conclusion are described in Appendix A Table 2 (refer to CAR 01, CAR 02, CAR 03, CAR 04, CL 03, CL 04).

3.7 Verification regarding programmes of activities (102-110)

Not applicable.

4 VERIFICATION OPINION

Bureau Veritas Certification has performed the 3 periodic verification of the project "Installation of a new waste heat recovery system in Alchevsk Coke Plant, Ukraine" Project in Ukraine, which applies the methodology ACM0012 version 03.1. The verification was performed on the basis of UNFCCC criteria and host country criteria and also on the criteria given to provide for consistent project operations, monitoring and reporting.

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

The management of Institute for Environment and Energy Conservation is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions of the project on the basis set out within the project Monitoring Plan as per determined changes. The development and maintenance of records and reporting procedures in accordance with that plan, including the calculation and determination of GHG emission reductions from the project, is the responsibility of the management of the project.

Bureau Veritas Certification verified the Project Monitoring Report version 02 for the reporting period as indicated below. Bureau Veritas Certification confirms that the project is implemented as per determined changes. Installed equipment being essential for generating emission reduction runs reliably and is calibrated appropriately. The monitoring system is in place and the project is generating GHG emission reductions.

Bureau Veritas Certification can confirm that the GHG emission reduction is calculated without material misstatements. Our opinion relates to the project's GHG emissions and resulting GHG emissions reductions reported and related to the approved 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 01/01/2011 to 31/12/2011

Baseline emissions	:	2 467 233	tonnes of CO_2 equivalent.
Project emissions	:	2 268 458	tonnes of CO_2 equivalent.
Leakages	:	0	tonnes of CO_2 equivalent.
Emission Reductions	:	198 775	tonnes of CO_2 equivalent.

5 REFERENCES

Category 1 Documents:
Documents provided by Institute for Environment and Energy Conservation, of the company that relate directly to the GHG components of the project.

/1/ Monitoring Report, version 01, dated 20 January 2012

/2/ Monitoring Report, version 02, dated 20 February 2012

/3/ Project Design Document, version 07, dated 22 December 2009

/4/ Letter of Approval from National Environmental Investment Agency of Ukraine № 1588/23/7 dated 29/12/2009

/5/ Approval of a JI project and authorization of participation under the Kyoto Protocol by the Government of Japan dated 07 September 2009

/6/ Excel spreadsheet of the emission reductions calculation

Category 2 Documents:
Background documents related to the design and/or methodologies employed in the design or other reference documents.

№	Name of the document
1.	Conclusion of complex staff expertise №1685 dated 25.08.2005 the project "Technical revamping of coke oven batteries №11-12 (complex of coke batteries № 10-bis)" PJSC “ALCHEVSKKOKS”. " State Enterprise "Luhansk regional office of the Ukrainian State Investment Expertise"
2.	Permit №4411200000-177 emissions of pollutants into the atmosphere from stationary sources (30.04.2010-30.04.2015)
3.	Permit №4411200000-177a amending the Permit № 4411200000-177 emissions of pollutants into the atmosphere from stationary sources (21.07.2011-21.07.2016)
4.	Permit №4411200000-177b amending the permit № 4411200000-177 emissions of pollutants into the atmosphere from stationary sources (15.12.2011-15.12.2016)
5.	Report 2-TP air in 2011
6.	The documents, which substantiate the emissions permit for the emission of pollutants into the atmosphere from stationary sources for PJSC “ALCHEVSKKOKS”. "Zephyr Ltd.", 2011
7.	Report on inventory of pollutant emissions to PJSC “ALCHEVSKKOKS”, "Zephyr Ltd.", Lugansk. 2011
8.	Act № 143 dated 12.10.2011 of sampling stationary sources. Ltd. "Zephyr"
9.	Declaration of readiness to object to the operation of turbine

	building CDQ facility - object of the 2nd phase of the 1st start of the technical revamping of coke oven batteries № 11-12 in complex coke battery №10-bis
10.	Delivery and Acceptance Certificate number 303 of 28.10.2011. Turbogenerator plant SST-300
11.	Act dated 21.12.2010 of the end of the comprehensive test boiler E-75-3, 9/440 gm century. № 4 TSTS
12.	Information. Producing and releasing steam CDQ facility for the 4th quarter 2011
13.	Information. Power for the 4th quarter 2011
14.	Information. Energy consumption in CDQ facility for the 4th quarter 2011
15.	Information. Hours of CDQ facility for the 4th quarter 2011
16.	Information. Indicators of quality of coke (October-December 2011)
17.	Information. Indicators of quality of coke (January-June 2011)
18.	Information. Consumption of coke dry quenching in blast furnaces AMC during the first half of 2011
19.	Passport № 06-884 Metran 100 di 1160 №272545 workshop Cox-3
20.	Passport № 06-840 Metran 100 di 1160 №272546 workshop Cox-3
21.	Passport № 06-893 Metran 100 BH di 1161 №369048 workshop Cox-3
22.	Passport № 06-1133 Metran-100-Ex-DD №279874 workshop Cox-3
23.	Passport № 06-860 Metran-100-1442 DD №279562 workshop Cox-3
24.	Passport № 06-1124 Metran-100-1450 DD №273636 workshop Cox-3
25.	Passport № 06-1073 TSP-1088 №1133 workshop Cox-3
26.	Passport № 06-1106 TSP-1088 №1130 workshop Cox-3
27.	Passport № 06-916 MTM-400AD №1490 workshop Cox-3
28.	Passport № 06-1004 TSMU-0198 №0706022 workshop Cox-3
29.	Passport № 06-1008 TSM-1088 №024-88 workshop Cox-3
30.	Passport № 06-1102 MTM-201D №2705 workshop Cox-3
31.	Passport № 06-993 TSMU-0198 №0706021 workshop Cox-3
32.	Passport № 06-1130 THAU 0198 №0706100 workshop Cox-3
33.	Passport № 06-1131 MTM-400AD №2098 workshop Cox-3
34.	Passport № 061003 MTM-400AD №2096 workshop Cox-3
35.	Passport № 190 weigher for weighing of coke, serial №1217 (BF №3)
36.	Passport № 191 weigher for weighing of coke, serial №1218 (BF №3)
37.	Passport № 192 weigher for weighing of coke, serial №1221 (BF №4)
38.	Passport № 193 weigher for weighing of coke, serial №1220 (BF №4)
39.	Passport № 194 weigher for weighing of coke, serial №1219 (BF

	№5)
40.	Passport № 195 weigher for weighing of coke, serial №1224 (BF №5)
41.	Passport № 196 weigher for weighing of coke, serial №1222 (BF №1)
42.	Passport № 197 weigher for weighing of coke, serial №1223 (BF №1)
43.	Passport. Electricity meter LZQM 321.02.534, serial № 917425
44.	Passport. Electricity meter LZQM 321.02.534, serial № 648648
45.	Passport. Electricity meter LZQM 411.05.534, serial № 67865
46.	Protocol №20 meeting the Qualification Commission of 05.05.2011 retraining workers
47.	Protocol №137 Qualifications Commission meeting on 26.06.2011 retraining workers
48.	Protocol №222 Qualifications Commission meeting on 10.11.2011 retraining workers
49.	Certificate №705 of Sidorenko N.A. - The operator control panel CDQ facility
50.	Certificate №784 of Nesterenko A.S.- The operator control panel CDQ facility
51.	Certificate №36051 on the right works with high risk of Drovalov R.Y. - Operator of boilers
52.	Certificate №36053 on the right works with high risk of Vishnevskyi O.P. - Operator of boilers
53.	Certificate №36052 on the right works with high risk of Samylov O.V. - Operator of boilers
54.	Protocol №184 commission meeting on testing of 05.09.2011. Operation and maintenance of turbine generators Siemens SST-300
55.	Minutes of staff training dated 22.09.2011 Construction and maintenance of steam turbine Siemens SST-300
56.	Certificate №206 of Salov O.V.- Operator of steam turbines
57.	Certificate №306 of Pertsyev O.M. - Operator of steam turbines
58.	Certificate №312 of Zaitsev V.R. - Operator of steam turbines
59.	Certificate №310 of Prokhorov I.M. - Operator of steam turbines
60.	Certificate №248 of Bannik O.O. - Operator of steam turbines
61.	Certificate №247 of Fedorov T.G. - Operator of steam turbines
62.	Certificate №246 of Sabinin L.I. - Operator of steam turbines
63.	Certificate №34877 on the right works with high risk of Yemchenko I.O. - Operator boilers
64.	Certificate №34873 on the right works with high risk of Homov O.I. - Operator boilers
65.	Certificate №34869 on the right works with high risk of Ishchenko N.M. - Operator boilers
66.	Certificate №34871 on the right works with high risk of Saveliev

	S.V. - Operator boilers
67.	Certificate №34872 on the right works with high risk of Chernyatin L.Y. - Operator boilers
68.	Certificate №34878 on the right works with high risk of Gamul A.A. - Operator boilers
69.	Certificate №34874 on the right works with high risk of Kistanov I.I. - Operator boilers
70.	Certificate №34870 on the right works with high risk shy of Soroklivіy R.V. - Operator boilers
71.	Certificate №36056 on the right works with high risk of Polishchuk N.V. - Operator boilers
72.	Photo. Steam boiler E-75-3, 9/440 GM
73.	Photo. Turbogenerator unit Siemens SST-300
74.	Passport. Steam boiler E-75-3, 9/440 GM
75.	Passport. Turbogenerator unit Siemens SST-300
76.	Order №134 dated 16/03/12 to appoint responsible for monitoring for JI Project, as well as the monitoring data storage periods

Persons interviewed:

List persons interviewed during the verification or persons that contributed with other information that are not included in the documents listed above.

/1/	Kovkin K.A. - Member of Alchevsk City Council
/2/	Danilov A.B. - Chief Engineer of PJSC “ALCHEVSKKOKS”
/3/	Soloviev M. A. – Head of production and technical department of PJSC “ALCHEVSKKOKS”
/4/	Pyankov V.I. – Head of Quality control department of PJSC “ALCHEVSKKOKS”
/5/	Zhuchenko V.A. - Head of environment protection department of PJSC “ALCHEVSKKOKS”
/6/	Falchenko S.O.- Chief power engineer of PJSC “ALCHEVSKKOKS”
/7/	Vatulin F.V. - Head of control measurement device shop of PJSC “ALCHEVSKKOKS”
/8/	Boychuk V.M. - Head of energy-saving bureau of PJSC “ALCHEVSKKOKS”
/9/	Mohulenko A.G. – power engineer of coke shop #3 of PJSC “ALCHEVSKKOKS”
/10/	Shevchuk V.V. - Deputy Head of heat and power workshop of PJSC “ALCHEVSKKOKS”
/11/	Yevtushenko K.U. – Engineer of production and technical department of PJSC “ALCHEVSKKOKS”
/12/	Khakimzyanov Shamil – Consultant of “Institute for Environment and Energy Conservation ”

APPENDIX A: "INSTALLATION OF A NEW WASTE HEAT RECOVERY SYSTEM IN ALCHEVSK COKE PLANT, UKRAINE" VERIFICATION PROTOCOL

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
Project approvals by Parties involved				
90	Has the DFPs of at least one Party involved, other than the host Party, issued a written project approval when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines, at the latest?	DFPs of the Japan have issued written project approvals (LoAs) when submitting the first verification report to the secretariat for publication in accordance with paragraph 38 of the JI guidelines.	OK	OK
91	Are all the written project approvals by Parties involved unconditional?	Yes, all the written project approvals by Parties involved are unconditional.	OK	OK
Project implementation				
92	Has the project been implemented in accordance with the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	According to the Project Design Document (PDD) version 7 from 22/12/2009, the project envisaged the following basic stages of project implementation: - Stage 1: Installation of CDQ facility (35 t/h of dry coke output x 3 boilers); - Stage 2: Installation of steam generator firing BFG and COG (75 t/h of steam output); - Stage F: Installation of 9,13 MWe captive electricity generator. Stage 1 was completed on 30th of September 2007. Stage 2 was completed in the beginning of year 2011. Stage F was completed in the beginning of October		

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		2011. The delay in project implementation plan was caused by financial and other factors such as construction delay etc. Delay of stage F completion caused some insignificant deviations in comparison with monitoring plan in PDD. Basically, delay of stage F increased the level of baseline emissions. **CL 01.** Please, provide the copies of passports on steam generator E-75 and Siemens captive electricity generator (SST-300). **CL 02.** Please, provide definition of the measurement unit «9,13 MWe».	CL 01 CL 02	OK OK
93	What is the status of operation of the project during the monitoring period?	Monitoring report indicated the current status of the project activity implementation. Based on provided materials, there is known that all project equipments were operational in the reporting period.	OK	OK
Compliance with monitoring plan				
94	Did the monitoring occur in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and is so listed on the UNFCCC JI website?	Yes, monitoring occurs in accordance with the monitoring plan included in the PDD regarding which the determination has been deemed final and verified changes and is so listed on the UNFCCC JI website.	OK	OK
95 (a)	For calculating the emission reductions or	All key factors influencing the baseline emissions or net	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	enhancements of net removals, were key factors, e.g. those listed in 23 (b) (i)-(vii) above, influencing the baseline emissions or net removals and the activity level of the project and the emissions or removals as well as risks associated with the project taken into account, as appropriate?	removals and the activity level of the project and the emissions or removals as well as risks associated with the project were taken into account, as appropriate for calculating the emission reductions or enhancements of net removals.		
95 (b)	Are data sources used for calculating emission reductions or enhancements of net removals clearly identified, reliable and transparent?	The monitoring at PJSC "ALCHEVSKKOKS" and AISW is conducted on monthly basis according to monitoring plan. Two operational managers at each plants are in charge for monitoring of GHG emissions and ERUs and preparation of annual monitoring reports. The data required to monitor the project are routinely collected within the normal operation of the Companies and therefore monitoring is also an integral part of routine monitoring. All data are collected into electronic database of the Companies. Data are complied in day-to-day records, monthly records and annual records. The appropriate data for GHG monitoring are fed into the Monitoring Database. The Project Developers are also supervise the implementation of the Monitoring Plan for the project at regular intervals.	OK	OK
95 (c)	Are emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully	Emission factors, including default emission factors, if used for calculating the emission reductions or enhancements of net removals, selected by carefully balancing accuracy and reasonableness, and	OK	OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	balancing accuracy and reasonableness, and appropriately justified of the choice?	appropriately justified of the choice.		
95 (d)	Is the calculation of emission reductions or enhancements of net removals based on conservative assumptions and the most plausible scenarios in a transparent manner?	The calculation of emission reductions is based on conservative assumptions and the most plausible scenarios in a transparent manner. As a result of documents revision, all data connected with estimation of emission reduction are consistent through the Monitoring report and excel spreadsheet with calculation.	OK	OK
Applicable to JI SSC projects only				
96	Is the relevant threshold to be classified as JI SSC project not exceeded during the monitoring period on an annual average basis? If the threshold is exceeded, is the maximum emission reduction level estimated in the PDD for the JI SSC project or the bundle for the monitoring period determined?	N/a	N/a	N/a
Applicable to bundled JI SSC projects only				
97 (a)	Has the composition of the bundle not changed from that is stated in F-JI-SSCBUNDLE?	N/a	N/a	N/a
97 (b)	If the determination was conducted on the basis of an overall monitoring plan, have the project participants submitted a common monitoring report?	N/a	N/a	N/a

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
98	If the monitoring is based on a monitoring plan that provides for overlapping monitoring periods, are the monitoring periods per component of the project clearly specified in the monitoring report? Do the monitoring periods not overlap with those for which verifications were already deemed final in the past?	N/a	N/a	N/a
Revision of monitoring plan				
Applicable only if monitoring plan is revised by project participant				
99 (a)	Did the project participants provide an appropriate justification for the proposed revision?	During this verification monitoring plan has not been revised.	N/a	N/a
99 (b)	Does the proposed revision improve the accuracy and/or applicability of information collected compared to the original monitoring plan without changing conformity with the relevant rules and regulations for the establishment of monitoring plans?	N/a	N/a	N/a
Data management				
101 (a)	Is the implementation of data collection procedures in accordance with the monitoring plan, including the quality control and quality assurance procedures?	Procedures of data collection are implemented in compliance with the approved monitoring plan. Monitoring data of the project is monitored in compliance with scheduled frequency approved in the developed monitoring plan and monitoring procedure. Training logbook and results of operator training were presented to the verification team during the site visit.		

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		Position and roles of person in the GHG data management process are defined in the monitoring report and are implemented on-site. **CAR 01.** Documents that confirm data storage under the emission reductions project (records, log books) are absent. **CL 03.** Please, provide the positive environmental expertise conclusion regarding implemented measures (steam generator, electricity generator). **CL 04.** Please, provide the certificate on attestation of atmosphere pollution measurement laboratory.	CAR 01 CL 03 CL 04	OK OK OK
101 (b)	Is the function of the monitoring equipment, including its calibration status, is in order?	All monitoring equipments have calibration. It is calibrated with periodic frequency (passport states the calibration frequency for every device) according to the national regulations. During site visit verifiers received and reviewed passports and/or certificates on calibration of all measurement equipments. **CAR 02.** The list of monitoring equipment is incorrect. **CAR 03.** The dates of conducted verifications/calibrations of the monitoring equipment are incorrect.	CAR 02 CAR 03 CAR 04	OK OK OK

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
		CAR 04. Passports (with information on conducted verifications/calibrations) for the weighting batchers are absent.		
101 (c)	Are the evidence and records used for the monitoring maintained in a traceable manner?	Data collection are clearly defined in the monitoring report and are implemented on-site.	OK	OK
101 (d)	Is the data collection and management system for the project in accordance with the monitoring plan?	The data collection and management system for the project is in accordance with the approved monitoring plan. Implementation of monitoring system was checked through site visit, and concluded that monitoring system is completely in accordance with the monitoring plan. This fact is also confirmed by the documents.	OK	OK
Verification regarding programs of activities (additional elements for assessment)				
102	Is any JPA that has not been added to the JI PoA not verified?	N/A	N/A	N/A
103	Is the verification based on the monitoring reports of all JPAs to be verified?	N/A	N/A	N/A
103	Does the verification ensure the accuracy and conservativeness of the emission reductions or enhancements of removals generated by each JPA?	N/A	N/A	N/A
104	Does the monitoring period not overlap with previous monitoring periods?	N/A	N/A	N/A
105	If the AIE learns of an erroneously included JPA, has the AIE informed the JISC of its findings in writing?	N/A	N/A	N/A
Applicable to sample-based approach only				

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
106	Does the sampling plan prepared by the AIE: (a) Describe its sample selection, taking into account that: (i) For each verification that uses a sample-based approach, the sample selection shall be sufficiently representative of the JPAs in the JI PoA such extrapolation to all JPAs identified for that verification is reasonable, taking into account differences among the characteristics of JPAs, such as: − The types of JPAs; − The complexity of the applicable technologies and/or measures used; − The geographical location of each JPA; − The amounts of expected emission reductions of the JPAs being verified; − The number of JPAs for which emission reductions are being verified; − The length of monitoring periods of the JPAs being verified; and − The samples selected for prior verifications, if any?	N/A	N/A	N/A
107	Is the sampling plan ready for publication through the secretariat along with the	N/A	N/A	N/A

DVM Paragraph	Check Item	Initial finding	Draft Conclusion	Final Conclusion
	verification report and supporting documentation?			
108	Has the AIE made site inspections of at least the square root of the number of total JPAs, rounded to the upper whole number? If the AIE makes no site inspections or fewer site inspections than the square root of the number of total JPAs, rounded to the upper whole number, then does the AIE provide a reasonable explanation and justification?	N/A	N/A	N/A
109	Is the sampling plan available for submission to the secretariat for the JISC.s ex ante assessment? (Optional)	N/A	N/A	N/A
110	If the AIE learns of a fraudulently included JPA, a fraudulently monitored JPA or an inflated number of emission reductions claimed in a JI PoA, has the AIE informed the JISC of the fraud in writing?	N/A	N/A	N/A

Table 2 Resolution of Corrective Action and Clarification Requests

Draft report clarifications and corrective action requests by validation team	Ref. to checklist question in table 1	Summary of project participant response	Verification team conclusion
CL 01. Please, provide the copies of passports on steam generator E-75 and Siemens captive electricity generator (SST-300).	92	The copies of passports on steam generator E-75 and Siemens captive electricity generator (SST-300) are now provided to the verifier.	CL 01 is closed based on the documents provided.
CL 02. Please, provide definition of the measurement unit «9,13 MWe».	92	The abbreviation MWe stands for – "megawatt electrical". Such term refers to electric power and is used in electric power industry. Definition for such abbreviation is now included in the modified monitoring report.	CL 02 is closed based on the explanation provided.
CAR 01. Documents that confirm data storage under the emission reductions project (records, log books) are absent.	101 (a)	The order concerning the procedure for keeping monitoring data and indication of names of the personnel involved in the monitoring #134 dated 16/03/2012 was issued by PJSC "ALCHEVSKKOKS" and is now provided to the verifier.	CAR 01 is closed based on the documents submitted.
CL 03. Please, provide the positive environmental expertise conclusion regarding implemented measures (steam generator, electricity generator).	101 (a)	Positive environmental expertise conclusion regarding implemented steam generator E-75 is now provided to the verifier. Together with this, taking into account that operation of Siemens captive electricity generator does not lead to any emissions of harmful substances into the atmosphere, there was no need in receiving positive environmental expertise conclusion regarding this electricity generator.	CL 03 is closed based on the explanation provided.
CL 04. Please, provide the certificate on attestation of atmosphere pollution measurement laboratory.	101 (a)	The certificate regarding laboratory attestation was provided to the verifier during previous verifications.	CL 04 is closed based on the documents submitted.

CAR 02. The list of monitoring equipment is incorrect.	101 (b)	The list of monitoring equipment is now corrected. Please see modified monitoring report.	CAR 02 is closed based on due corrections made to the MR.
CAR 03. The dates of conducted verifications/calibrations of the monitoring equipment are incorrect.	101 (b)	Correct dates of conducted periodic verifications and calibrations are now included in the modified monitoring report.	CAR 03 is closed based on due corrections made to the MR.
CAR 04. Passports (with information on conducted verifications/calibrations) for the weighting batchers are absent.	101 (b)	Copies of passports (together with verification information) for weighting batchers are now provided to the verifier.	CAR 04 is closed based on the documents submitted.