VERIFICATION AND CERTIFICATION REPORT

Chemplast Sanmar Ltd

Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd

SGS Climate Change Programme
SGS United Kingdom Ltd
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Date of Issue:	Project No.:
20th September 2007	CDM.VER0201
Project Title	Organisational Unit:
Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd	SGS United Kingdom Limited
Revision Number	Client:
01	Chemplast Sanmar Ltd

Summary:

SGS United Kingdom Ltd has performed the first verification of the CDM project "Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd" and UNFCCC Ref. Number 0499. The verification includes confirming the implementation of the monitoring plan of the registered PDD Version 1.1 10th January 2006 (Project No. 0499) and the application of the monitoring methodology as per AM0001 Version 3 dated 13th May 2005. A site visit was conducted to verify the data submitted in the monitoring report.

The project activity is to reduce Greenhouse Gas (GHG) emissions by decomposing HFC-23 at refrigerant (HCFC 22) manufacturing facility of Chemplast Sanmar Limited (CSL) at Town: Mettur, District: Salem, State: Tamil Nadu, India. CSL has been in the business of manufacturing and selling CFC-11, CFC-12 and HCFC-22. HFC-23 is an inevitable by-product generated during production of HCFC-22. The project activity uses Thermal Oxidation to decompose HFC-23. Thermal Oxidation (Incineration) is an engineered process designed to effect complete oxidation of the organic materials present in waste streams.
The emission reductions for the project activity in terms of tCO2e is a function of the amount of pure HFC23 incinerated and the GWP of HFC23 (GWP of HFC23 is 11,700).

SGS confirms that the project is implemented in accordance with the validated and registered Project Design Document. The monitoring system is in place and the emission reductions are calculated without material misstatements. Our opinion relates to the projects GHG emissions and the resulting GHG emission reductions reported and related to the valid and registered project baseline and monitoring and its associated documents. Based on the information seen and evaluated we confirm that the implementation of the project has resulted in Insert emission reductions tCO2e during period 16/02/2007 up to 31/08/2007.

Subject.:			
CDM project Verification			**Indexing terms**
Report Title			
Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd			
Technical Review (name and date)			
Irma Lubrecht; 20-09-2007 and 27-09-2007			☒ No distribution without permission from the Client or responsible organisational unit
Authorized Signatory (name and date)			
Siddharth Yadav; 27th September 2007			☐ Limited distribution
Date of Final Decision: 27th September 2007	Number of Pages: 17		☐ Unrestricted distribution

Abbreviations

CAR	Corrective Action Request
CDM	Clean Development Mechanism
CEA	Central Electricity Authority
CER	Carbon Emission Reduction
CO2	Carbon Dioxide
CSL	Chemplast Sanmar Limited
DNA	Designated National Authority
DOE	Designated Operational Entity
EIA	Environmental Impact Assessment
GC	Gas Chromatography
GHG	Green House Gases
GWP	Global Warming Potential
IPCC	Intergovernmental Panel on Climate Change
KW	Kilo Watt
KWh	Kilo Watt Hour
MT	Metric Tonnes
MW	Mega Watt
NaOH	Sodium hydroxide (Industrial name – Caustic soda)
Na2CO3	Sodium Sulphite
NIR	New Information Request
%	Percentage
QC	Quality Control
tCO2e	Tonnes of CO2 equivalent
TNEB	Tamil Nadu Electricity Board
TNPCB	Tamil Nadu Pollution Control Board
UNFCCC	United Nations Framework Convention on Climate Change

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1. Introduction

1.1 Objective

SGS United Kingdom Ltd has been contracted by Chemplast Sanmar Ltd (CSL) to perform an independent verification of its CDM project "*Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd" UNFCCC ref No 0499*. CDM projects must undergo periodic audits and verification of emission reductions as the basis for issuance of Certified Emission Reductions (CERs).

The objectives of this verification exercise are, by review of objective evidence, to establish that:

- The emissions report conforms with the requirements of the monitoring plan in the registered PDD and the approved methodology; and
- The data reported are complete and transparent.

1.2 Scope

The scope of the verification is the independent and objective review and ex post determination of the monitored reductions in GHG emission by the project activity. The verification is based on the validated and registered project design document and the monitoring report. The project is assessed against the requirements of the Kyoto Protocol, the CDM Modalities and Procedures and related rules and guidance.

SGS 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 reporting risks and the reliability of project monitoring.

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 design.

1.3 Project Activity and Period Covered

This engagement covers emissions and emission reductions from anthropogenic sources of greenhouse gases included within the project boundary of the following project and period.

Title of Project Activity:	*Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd*
UNFCCC Registration No:	*0499*
Monitoring Period Covered in this Report	*16/02/2007* up to 31*/08/2007*
Project Participants	*Chemplast Sanmar Ltd*
Location of the Project Activity:	*Latitude - 11.520N and the longitude - 77.500E. Town: Mettur, District: Salem, State: Tamil Nadu,*

The project activity is to reduce Greenhouse Gas (GHG) emissions by decomposing HFC-23 at refrigerant (HCFC 22) manufacturing facility of Chemplast Sanmar Limited (CSL) at Town: Mettur, District: Salem, State: Tamil Nadu, India.

HFC-23 is an inevitable by-product generated during production of HCFC-22. The project activity uses thermal oxidation technology to decompose HFC-23. Thermal Oxidation (Incineration) is an engineered process designed to effect complete oxidation of the organic materials present in waste streams.

The emission reductions for the project activity in terms of tCO2e is a function of the amount of pure HFC23 incinerated and the GWP of HFC23 (GWP of HFC23 is 11,700).

2. Methodology

2.1 General Approach

SGS's approach to the verification is a two-stage process.

In the first stage, SGS completed a strategic review and risk assessment of the projects activities and processes in order to gain a full understanding of:

- Activities associated with all the sources contributing to the project emissions and emission reductions, including leakage if relevant;
- Protocols used to estimate or measure GHG emissions from these sources;
- Collection and handling of data;
- Controls on the collection and handling of data;
- Means of verifying reported data; and
- Compilation of the monitoring report.

At the end of this stage, SGS produced a Periodic Verification Checklist which, based on the risk assessment of the parameters and data collection and handling processes for each of those parameters, describes the verification approach and the sampling plan.

Using the Periodic Verification checklist, SGS verified the implementation of the monitoring plan and the data presented in the Monitoring Report for the period in question. This involved a site visit and a desk review of the monitoring report. This verification report describes the findings of this assessment.

2.2 Verification Team for this Assessment

Name	*Role*	*SGS Office*
Mr. Shivananda Shetty	Team Leader	SGS India
Mr. Kamesh Iyer	Local Assessor	SGS India

2.3 Means of Verification

2.3.1 Review of Documentation

The validated PDD, the monitoring report submitted by the client and additional background documents related to the project performance were reviewed. A complete list of all documents reviewed is attached in section 8 of this report.

2.3.2 Site Visits

As part of the verification, the following on-site inspections have been performed

Location: CSL Plant I (Project Activity)
Date: 14th-15th September 2007

Coverage	***Source of information / Persons interviewed***
Management Approach to GHG commitment	Mr. G Sankarasubramanian - CDM project Director Mr. S Venkatraghavan – GM Marketing
Assessment of Project Boundary	Physical Verification/DCS flow diagram
Physical components	Physical Verification /SAP data/DCS/Commissioning certificates Mr. G Sankarasubramanian - CDM project Director Mr. Arun Kumar – Sr. Inst. Engineer Mr. S Gokula Krishnan – Process Engineer
Qualification and Training	Supplier Training Certificate/ Interviews Mr. P Shreeram – HR Mr. G Sankarasubramanian - CDM project Director Mr. Arun Kumar – Sr. Inst Engineer
Plant Operations	Plant Manual/
Roles and responsibility	”GHG performance procedures” Manual/ SOPs/ Interview Mr. G Sankarasubramanian - CDM project Director
Monitoring and measuring system • *Collection of measurements* • *Observations of established practices* • *Testing of the accuracy of monitoring equipment* • *DCS logging and transmitter accuracy* • *Data Verification of monitoring parameters* • *GC LAB*	Physical Verification /logs/SAP data/DCS/ Calibration procedures/ Calibration certificates/Zero Check procedures/Zero Check records/Excise records/GC Lab test/GC Chromatogram Lab records/ QC Manual/Supplier data/transportation record/External Lab reports (ISO 17025 certified) Mr. G Sankarasubramanian - CDM project Director Mr. S Venkatraghavan – GM Marketing Mr. Arun Kumar – Sr. Inst. Engineer Mr. S Gokula Krishnan – Process Engineer
CDM monitoring & reporting documentation	”GHG performance procedures” Mr. G Sankarasubramanian - CDM project Director Mr. Ashutosh Pandey - Consultant
Quality Assurance – Management and operating system	Internal Audit procedure/ Internal Audit records. Mr. G Sankarasubramanian - CDM project Director Mr. Arun Kumar – Sr. Inst. Engineer Mr. S Gokula Krishnan – Process Engineer
Emergency procedures	PLC/ P & I Diagrams/DCS Mr. Arun Kumar – Sr. Inst. Engineer

	Mr. S Gokula Krishnan – Process Engineer
Environmental Monitoring	TNPCB consents/ TNPCB Ambient Air quality/Stack monitoring/ monitoring report/ External Lab monitoring reports (ISO 17025 certified) Environmental Engineer
Social Indicator(s)	Employment record Mr. P Shreeram – HR

2.4 Reporting of Findings

As an outcome of the verification process, the team can raise different types of findings.

In general, where insufficient or inaccurate information is available and clarification or new information is required the team shall raise a New Information Request (NIR) specifying what additional information is required.

Where a non-conformance arises the team shall raise a Corrective Action Request (CAR). A CAR is issued, where:

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

II. the verification has identified misstatements in the reported emission reductions. Emission reductions with misstatements shall be discounted based on the verifiers ex-post determination of the achieved emission reductions

The verification process may be halted until this information has been made available to the assessors' satisfaction. Failure to address a NIR may result in a CAR. Information or clarifications provided as a result of an NIR may also lead to a CAR.

Observations may be raised which are for the benefit of future projects and future verification actors. These have no impact upon the completion of the verification activity.

Corrective Action Requests and New Information Requests are detailed in Periodic Verification Checklist. The Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.

2.5 Internal Quality Control

Following the completion of the assessment process and a recommendation by the Assessment Team, all documentation will be forwarded to a Technical Reviewer. The task of the Technical Reviewer is to check that all procedures have been followed and all conclusions are justified. The Technical Reviewer will either accept or reject the recommendation made by the assessment team.

3. Verification Findings

3.1 Project Documentation and Compliance with the Registered PDD

The starting date of 16th February 2007 for the first monitoring period coincides with the date listed on the CDM website. The monitoring report version 2 dated 18th September 2007 reflects the monitoring plan in the registered PDD and the version of the methodology AM0001 Version 3 dated 13th May 2005. The parameters mentioned in the monitoring plan are described in the monitoring report version 2 dated 18th September 2007. The monitoring approach for each parameter described in the PDD for monitoring the parameters is consistent in terms of units, measurement procedures and monitoring frequency. QA/QC procedures are consistent as mentioned in the registered PDD. The following CARs were raised during verification of project documentation and compliance with the registered PDD:

CAR1 was raised as the start date of the storage of HFC23 was given as 16th February 2007 whereas the SAP data for the plant shows storage start date from 2nd March 2007. The project proponent clarified that the plant production of HFC23 and HCFC22 had started on 17th February 2007 and the HFC23 storage starts when the HFC23 has attained the desired purity. Till the purity is obtained it is refluxed back into the distillation process. The storage had indeed started on 2nd March 2007 as per SAP records. These technical details were confirmed onsite by the verifier along with the details on the SAP/plant records. The MR version 2 had also incorporated the corrected date. Hence, CAR1 was closed.

CAR2 was raised as the recording frequency for quantity of waste stream supplied to the destruction process (q_HFC23y) according to the registered PDD was continuous however MR version 1 stated that it as monthly. The proponent clarified that it was a typing error in MR version1. This was accepted as it was observed and verified on site that the recording of the parameter was continuous through DCS and MR version 2 was revised accordingly. Hence, CAR2 was closed.

3.2 Monitoring Results

The monitoring results for each of the parameters for the project activity is discussed in brief:

The quantity of Waste Stream supplied to the destruction process (q_HFC23) was checked initially using MR version 1 and spreadsheet along with the records. CAR3 was raised as the closing stock data for HFC23 was not matching in MR version 1 and spreadsheet. In response to the raised CAR the proponent revised the MR (version 2) as per the records and spreadsheet. This was verified and found accurate hence, CAR3 was closed. The calibration records for the Mass flow meters and their calibration were checked along with the zero check procedure and records (weekly checks were carried out) and found OK.

The purity of HFC23 in the Waste stream supplied to the destruction process (P_HFC23) was checked against MR version 1and spreadsheet initially. While checking the GC chromatograms, in some of the GC chromatograms the air peak which eluted before HFC23 was not considered in the calculation of the purity. In response, the proponent explained that the GC software excluded areas for the peaks below a predefined value. In response the sensitivity of the GC analysis was increased so as the calculations and results included the smallest areas and the results were re-run and revised results were included. The Monitoring Report was also revised accordingly. These re-run GC chromatogram results submitted were verified and found OK. Hence, CAR4 was closed. The calibration records were checked and was found OK.

The quantity of HCFC22 produced in the plant generating the HFC23 waste (Q_HCFC22) was checked using MR version 1 and spreadsheet. As per the registered PDD the annual cap for HCHC22 is 1694.59 MT. The first monitoring report covers production data from 16th Feb 07 – 31st Aug 07. The plant logs, excise records and SAP records were verified and cross-checked and found OK. The calibration charts of the level trolls were in place and data was verifiable.

The HFC23 as % of HCFC22 produced was on the stored quantity and not on pure supplied quantity in MR version 1. Hence NIR5 was raised. The proponent clarified that for baseline check, as per AM0001 (V3) the pure HFC23

(Q_HFC23) supplied to incinerator shall be within the capped quantity (w X Q_HCFC22) on an annual basis. The registered PDD limit Q_HCFC22 to historical maxima is stated 1694.59 MT. Further the proponent clarified that the baseline check has been performed on stored quantity of HFC23, where as the same shall be on pure HFC23 supplied to incinerator (Q_HFC23 ≤ w X Q_HCFC22). MR version 2 was corrected to include baseline check on Q_HFC23 and on Q_HCFC22 in the Appendix-2 to show that HCFC22 produced was less than 1694.59 MT. This was verified by the team along with the data for Q_HFC23 and on Q_HCFC22. MR version 2 had incorporated the baseline check based on pure quantity and this has to be verified during subsequent verifications annually. Hence, NIR5 was closed considering the annual component of historical maxima is within limits.

The quantity of HFC23 sold by facility generating HFC23 wastes (HFC23_sold) was checked against MR version 1, spreadsheet and excise records which clearly showed no sale.

The quantity of power used in destruction process (Q_Fpower) was verified against MR version 1, spreadsheet and log books. The physical verification was carried out at site and the calibration certificates examined and found OK.

The emission factor for Southern Grid was checked against the MR, spreadsheet and registered PDD. CAR6 was raised as the emission factor for the southern grid was taken from the registered PDD, however the emission factor had to be calculated yearly as per AM0001 Version 3. The proponent responded by revising the EF based on the CEA data for the southern grid, which is publicly available, in MR version 2. This was verified and found conservative. Hence, CAR6 was closed.

The quantity of NaOH (caustic soda) used in the effluent treatment plant (Q_NAOH) was checked and found OK against MR version 1, spreadsheet and logbooks.

The Power used for production of 1MT of NaOH (P_NAOH) was verified against MR version 1 and spreadsheet also with the MIS records for the quantity against power and the values were found OK.

For the following parameters - fuel used for Transportation of 1MT of NaOH (F_NAOH); Fuel used for Transportation of 1MT of Na2CO3 (F_Na2CO3); Fuel used for Transportation of 1MT of Hydrogen (F_Hydrogen), NIR7 was raised asking the proponent to elaborate the leakage calculations due to transportation. The proponent responded by elaborating the transportation calculations and included these in the spreadsheet. The calculations were verified and found OK. Hence, NIR7 was closed. These parameters were verified by checking transport records along with MR and spreadsheet.

The quantity of Na2SO3 (Sodium Sulphite) used in the effluent treatment plant (Q_Na2SO3) was verified against MR version 1, spreadsheet and logbooks. CAR8 was raised as the conversion unit reported for quantity of Sodium Sulphite used in effluent treatment plant did not match in the spreadsheet and MR version 1. The proponent corrected the units of weight and also revised MR version 2 accordingly. This was verified and found OK. Hence, CAR8 was closed.

The power used for production of 1MT of Na2CO3 (P_NA2CO3) was verified against MR version 1 and spreadsheet also with the industrial data (The historic data had been provided by the supplier and the highest value had been taken) and has been verified and found OK.

The quantity of Hydrogen used in the destruction process (Q_Hydrogen) was checked and found OK against MR version 1, spreadsheet and SAP data records.

Power used for production of 1NM3 of Hydrogen (P_Hydrogen) was checked and found OK; against MR version 1, spreadsheet and the MIS data from the sourcing plant.

The quantity of Compressed Air used in the destruction process (Q_Compressed Air) was checked against the MR, spreadsheet and the DCS records and the values were found OK. The calibration for the air flow meter was also checked and was found to be OK.

Power used for production of 1Nm3 of Compressed Air (F_Compressed) was verified against MR version 1, spreadsheet and log books. The physical verification was carried out at site and the calibration certificates examined and found OK.

In addition to this a check was done to ensure that cumulative HCFC22 produced and HFC 23 incinerated during the current year do not exceed the cap.

Year (current)	HCFC22 prodcuced during current year, MT	HCFC production cap for current yr, MT	HFC23 waste stream supplied for destruction, MT (q_HFC23)	HFC23 (pure) incinerated, MT	HFC23 incinerated as percentage of HCFC22 produced during current year	Waste stream generated during current year, MT	Stored waste stream of HFC23 eligible for Carbon credits, MT
16/02/07 to 31/08/07	845.732	1694.59	6.019	5.879	0.70%	20.402	14.383

3.3 *Remaining Issues, CAR's, FAR's from Previous Validation or Verification*

There are no pending issues.

3.4 Project Implementation

Project was implemented and equipment installed as described in the registered PDD.
The project activity has been operational since 14th August 2007. The storage whereas started on 2nd March 2007. Caloric Anlagenbau-Germany has supplied the incinerator (thermal oxidation) and had carried out the establishment and commissioning.

3.5 *Completeness of Monitoring*

The reporting procedures reflect the content of the monitoring plan. The monitoring mechanism is effective and reliable.

3.6 Accuracy of Emission Reduction Calculations

The calculation of emission reductions is found to be correct. The response to CARs and NIRs was satisfactory and hence these were closed.

3.7 Quality of Evidence to Determine Emission Reductions

Critical parameters used for the determination of the Emission Reductions are discussed above in section 3.2. All data recorded is in compliance with the monitoring report.

3.8 Management System and Quality Assurance

The company involved in the project has a quality assurance system implemented; therefore we can affirm that the management system in the CDM project is in place; with the responsibilities properly identified and in place.

In order to verify data quality, the company involves in the project works in accordance with a quality assurance procedure (Procedure for Monitoring Plan Implementation), which establishes the operational and management structure implemented.

3.9 Data from External Sources

IPCC and CEA data is used. The issue of CEA data has been briefed in Section 3.2 pertaining to CAR6.

4. Overview of Results

Assessment against the provisions of Decision 17/CP.7:

Is the project documentation in accordance with the requirements of the registered PDD and relevant provision of decision 17/CP.7, EB decisions and guidance and the COP/MOP?

Yes. The results of the compliance assessment are recorded in the verification checklist which is used as an internal report only.

Have on-site inspections been performed that may comprise, inter alia, a review of performance records, interviews with project participants and local stakeholders, collection of measurements, observations of established practices and testing of the accuracy of monitoring equipment?

Yes. Shivananda Shetty (Team Leader) and Kamesh Iyer (Local Assessor) visited the sites and undertook interviews, collected data, audited the implementation of procedures, checked calibration certificates and checked data, inter alia.

The results of the site visits are recorded in the verification checklist which is used as an internal report only.

The evidences have been checked and collected. The revised monitoring report is attached with this verification report.

Has data from additional sources been used? If yes, please detail the source and significance.

The external data that have been used are the GWP for HFC23 and the latest CEA data for the grid emission factor for the southern grid of India. During the verification the procedures for measuring, collecting and handling of these data were checked. The IPCC default values have referred wherever appropriated.

Please review the monitoring results and verify that the monitoring methodologies for the estimation of reductions in anthropogenic emissions by sources have been applied correctly and their documentation is complete and transparent.

Yes. The monitoring methodology has been correctly applied and the monitoring report and supporting references are complete and transparent.

Have any recommendations for changes to the monitoring methodology for any future crediting period been issued to the project participant?

No, the plant has already implemented correct monitoring methodology and following the same.

Determine the reductions in anthropogenic emissions by sources of greenhouse gases that would not have occurred in the absence of the CDM project activity, based on the data and information using calculation procedures consistent with those contained in the registered project design document and the monitoring plan.

*The data used in anthropogenic emission reduction calculation is consistent with those contained in the registered PDD and monitoring plan. The emission reduction is calculated for the first monitoring period from 16th February 2007 to 31st August 2007. The historical annual maxima (Q_HCFC22) and minima (waste generation rate) capped as per registered PDD is well within limits for the first monitoring period and shall be verified subsequently in following verifications and evaluated annually. The actual emission reduction has been verified as **68,777** tCO2 for the first monitoring period from 16th February 2007 to 31st August 2007.*

Sr.No	Nomenclature	Parameter	Result
1	**q_HFC23 y**	Quantity of Waste Stream supplied to the destruction process (MT)	**6.019**
2	**P_HFC23 y**	Purity of HFC23 in waste stream supplied to destruction facility (%)	**97.682**
3	**Q_HFC23 y**	Quantity of HFC23 incinerated (MT)	**5.879**
4	**E_DP y**	Project Emissions (tCO2e)	**3.77**
5	**L y**	Leakage(tCO2e)	**8.335**
6	**GWP_HFC23**	Global warming potential of HFC23	**11,700**
7	**B_HFC23 y**	HFC23 required to be destroyed by applicable regulation	**0**

ER y = (Q_HFC23 y - B_HFC23 y) * GWP_HFC23 - E_DP y – L y

ER y = (5.879 - 0) * 11,700 – 3.77 – 8.335

ER y = 68,777 tCO2e

Identify and inform the project participants of any concerns related to the conformity of the actual project activity and its operation with the registered project design document. Project participants shall address the concerns and supply relevant additional information.

No such non conformity of the actual project activity and its operation with the registered project design document has been observed.

Post monitoring report on UNFCCC website

Yes, the monitoring report is available at ref. 0499 on UNFCCC website
http://cdm.unfccc.int/Issuance/MonitoringReports

5. Calculation of Emission Reductions

Parameter	*Reported Value*	*Verified Value*
Quantity of Waste Stream supplied to the destruction process q_HFC23	6.019 MT	6.019 MT
Purity of HFC23 in the Waste stream supplied to the destruction process P_HFC23	97.735 %	97.682 %
The quantity of HCFC22 produced in the plant generating the HFC23 waste Q_HCFC22	845.732 MT	845.732 MT
The quantity of HFC 23 sold by facility generating HFC 23 waste HFC23_sold	0	0
Quantity of power used in destruction process Q_Fpower	4,900 MT	4,900 MT
Emission factor for Grid	0.814	0.86
Quantity of NaOH (caustic soda) used in the effluent treatment plant Q_NaOH	0.0176 MT	0.0176 MT
Power used for production of 1MT of NaOH P_NaOH	1,231 KWh/MT	1,231 KWh/MT
Fuel used for Transportation of 1MT of NaOH F_NaOH	0.25 KL/MT	0.25 KL/MT
Quantity of Na2SO3 (Sodium Sulphite) used in the effluent treatment plant Q_Na2SO3	181.1 MT	0.1811 MT
Power used for production of 1MT of Na2CO3 P_Na2SO3	475 KWh/MT	475 KWh/MT
Fuel used for Transportation of 1MT of Na2CO3 F_Na2SO3	7.25 KL/MT	7.25 KL/MT
Quantity of Hydrogen used in the destruction process Q_Hydrogen	27,718 NM^3	27,718 NM^3
Power used for production of 1NM3 of Hydrogen P_Hydrogen	0.1KWh/NM^3	0.1KWh/NM^3
Fuel used for Transportation of 1MT of Hydrogen F_Hydrogen	0.0012 L/ NM^3	0.0165 L/ NM^3
Quantity of Compressed Air used in the destruction process Q_Compressed Air	56698.8 NM^3	56698.8 NM^3
Power used for production of 1Nm3 of Compressed Air F_Compressed	0.0077 KWh/ NM^3	0.0077 KWh/ NM^3

Reporting periods: **16th February 2007 to 31st August 2007**

Quantity of Waste Stream supplied to the destruction process (MT): **6.019**
Purity of HFC23 in waste stream supplied to destruction facility (%): **97.682**
Quantity of HFC23 incinerated (MT): **5.879**
Project Emissions (tCO2e): **3.77**
Leakage (tCO2e): **8.335**
Global warming potential of HFC23 (Conversion Factor) **11,700**
HFC23 required to be destroyed by applicable regulation: **0**

Verified Avoided emissions: (5.879 - 0) * 11,700 – 3.77 – 8.335 = **68,777 tCO2e**

6. Recommendations for Changes in the Monitoring Plan

No specific recommendation

7. Verification and Certification Statement

SGS United Kingdom Ltd has been contracted by *Chemplast Sanmar Ltd (CSL)* to perform the verification of the emission reductions reported for the CDM project "*Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd" UNFCC ref No 0499* in the period *16/02/2007 to 31/08/2007.*

The verification is based on the validated and registered project design document and the monitoring report for this project. Verification is performed in accordance with section I of Decision 3/CMP.1, and relevant decisions of the CDM EB and CoP/MoP. The scope of this engagement covers the verification and certification of greenhouse gas emission reductions generated by the above project during the above mentioned period, as reported in the first Monitoring report of 0499:*Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd" dated 18/09/2007 Version 2*.

The management of the *Chemplast Sanmar Ltd (CSL)* is responsible for the preparation of the GHG emissions data and the reported GHG emissions reductions on the basis set out within the project Monitoring Report version 2 *18/09/2007*. The development and maintenance of records and reporting procedures are in accordance with the monitoring report, including the calculation and determination of GHG emission reductions from the project is the responsibility of the management of the *Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd*.

It is our responsibility to express an independent GHG verification opinion on the GHG emissions from the project for the period 16/02/2007 to 31/08/07 and on the calculation of GHG emission reductions from the project for the period 16/02/2007 to 31/08/07 based on the reported emissions in the Monitoring Report 18/09/2007 for the period 16/02/2007 to 31/08/07.

Based on an understanding of the risks associated with reporting GHG emissions data and the controls in place to mitigate these, SGS planned and performed our work to obtain the information and explanations that we considered necessary to provide sufficient evidence for us to give reasonable assurance that this reported amount of GHG emission reductions for the period is fairly stated.

SGS confirms that the project is implemented as described in the validated and registered project design documents. Based on the information we have seen and evaluated, we confirm the following:

Name and Reference Number of Project	"Destruction of HFC-23 at refrigerant (HCFC-22) manufacturing facility of Chemplast Sanmar Ltd" UNFCC ref No 0499 CDM.VER0201
Registered PDD and Approved Methodology used for Verification	Registered PDD Version 1.1 dated 10th January 2006 AM0001 Version 3 dated 13th May 2005
Applicable Period	16/02/2007 up to 31/08/2007
Total GHG Emission Reductions Verified	68,777 tCO2e

Signed on behalf of the Verification Body by Authorized Signatory

Signature:

Name: Siddharth Yadav

Date: 27-09-2007

8. Document References

/1/ Registered PDD Version 1.1 dated 10th January 2006

/2/ AM0001 Version 3 dated 13th May 2005

/3/ Calibration details

/4/ CSL_HFC_Calculations_150907.xls

/5/ DCS records

/6/ Excise records

/7/ GC chromatograph Lab records

/8/ GHG Performance Audit Report

/9/ GHG performance procedures – CDM monitoring & reporting documentation

/10/ IPCC-Second & Third assessment report

/11/ Monitoring Report Version 1 dated 12th September 2007

/12/ Monitoring Report Version 2 dated 18th September 2007

/13/ Monitoring Report Version 3 dated 26th October 2007

/14/ Operating Manual – Plant

/15/ Power consumption records

/16/ SOP for Mass Flow Meter Zero checking

/17/ Zero check records

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