VOLUNTARY CARBON STANDARD 2007.1

VERIFICATION REPORT

2ND PERIODIC VERIFICATION

CHEMICAL RECOVERY PROJECT AT SATIA INDUSTRIES LTD. (SIL), FORMERLY KNOWN AS SATIA PAPER MILLS LTD., VILLAGE RUPANA, PUNJAB

Monitoring Period: 2008-11-01 to 2010-08-31

(incl. both days)

Report No: 8107630527 – 11/114

Date: 2011-09-08

TÜV NORD CERT GmbH
JI/CDM Certification Program
Langemarckstraße, 20
45141 Essen, Germany
Phone: +49-201-825-3335
Fax: +49-201-825-3290
www.tuev-nord.de
www.global-warming.de

Name of Verification company:	Date of the issue:
TÜV NORD CERT GmbH	2011-09-08
Report Title:	**Approved by:**
Chemical Recovery project at Satia Industries Ltd. (SIL), formerly known as Satia Paper Mills Ltd. , village Rupana , Punjab	Ingo Klein
Client:	**Project Title:**
Satia Industries Ltd. (SIL)	Chemical Recovery project at Satia Industries Ltd. (SIL), formerly known as Satia Paper Mills Ltd. , village Rupana , Punjab

Summary:

Satia Industries Ltd. (SIL) has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project "Chemical Recovery project at Satia Industries Ltd. (SIL), formerly known as Satia Paper Mills Ltd. , village Rupana , Punjab" in Muktsar, Punjab, India with regard to the requirements of VCS 2007.1 Standard.

The project activity involves recovery of Soda and utilization of the same in the industry and compensates the soda purchase from the open market in the baseline. This project activity also resulted in recycling of white liquor used in the paper industry.
Reporting period: From 01-11-2008 to 31-08-2010.

In the course of the verification 06 Corrective Action Requests (CARs), 02 Clarification Requests (CLs) were successfully closed.

The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the validated PD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

As the result of the 2nd periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Emission reductions 39031 t CO2 equivalents

Work carried out by:	Number of pages:
Mr. Pankaj Mohan (TL) Mr. Prakash Kumar Mishra (TM) Ms. Arshi Vimal (TM) Mr. Manojkumar Borekar(TM)	34

Abbreviations

BAU	Business as usual
CA	Corrective Action / Clarification Action
CAR	Corrective Action Request
CDM	Clean Development Mechanism
CO_2	Carbon dioxide
CO_{2e}	Carbon dioxide equivalent
CP	Certification Program
CRP	Chemical Recovery Plant
CL	Clarification Request
DNA	Designated National Authority
EB	CDM Executive Board
EIA	Environmental Impact Assessment
ER	Emission Reduction
E&Y	Ernst and Young
FAR	Forward Action Request
FO	Furnace Oil
GHG	Greenhouse gas(es)
IPCC	Intergovernmental Panel on Climate Change
MP	Monitoring Plan
MR	Monitoring Report
SIL	Satia Industries Ltd.
QC/QA	Quality control/Quality assurance
UNFCCC	United Nations Framework Convention on Climate Change
VCS	Voluntary Carbon Standard
VCS - PD	VCS - Project Description
VCU	Voluntary Carbon Unit
VVM	Validation and Verification Manual

Table of Contents *Page*

1 INTRODUCTION

The Satia Industries Ltd. (SIL) has commissioned the TÜV NORD JI/CDM Certification Program to carry out the verification of the project:

"Chemical Recovery project at Satia Industries Ltd. (SIL), formerly known as Satia Paper Mills Ltd., village Rupana , Punjab"

with regard to the relevant requirements of the Voluntary Carbon Standard 2007.1 /VCS/. The verifiers have reviewed the implementation of the monitoring plan (MP) in the registered VCS project for the monitoring period 2008-11-01 to 2010-08-31.

The applied monitoring methodology is AMS III.M., Version02 EB-33, and Sectoral Scope: 05 "Reduction in Consumption of Electricity by Recovering Soda from Paper Manufacturing Process".

1.1 Objective

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

- to verify that the project is implemented as described in the project design document;
- to assess the implementation of the monitoring plan (MP) content in the VCS-PD;
- to assess the project's compliance with other relevant rules, including the host country (India) legislation;
- to confirm that the monitoring system is implemented and fully functional to generate voluntary emission reductions (VERs / VCUs) without any double counting; and
- to establish that the data reported are accurate, complete, consistent, transparent and free of material error or omission by checking the monitoring records and the emissions reduction calculation.

1.2 Scope and Criteria

The verification of this project is based on the validated project design document /VCS-PD/, the monitoring report/MR/, emission reduction calculation spread sheet/XLS/, supporting documents made available to the verifier and information collected through performing interviews and during the on-site assessment. Furthermore publicly available information was considered as far as available and required.

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

1.3 VCS Project Description

1.3.1 Project Characteristics

Essential data of the project is presented in the following Table 1-1.

Table 1-1: Project Characteristics

Item	Data			
Project title	Chemical Recovery project at Satia Industries Ltd. (SIL), formerly known as Satia Paper Mills Ltd. , village Rupana , Punjab.			
Project owner	Satia Industries Ltd. (SIL)			
Any specific project categories	☐ Mega project (> 10^6 t CO_{2eq} / a) ☒ Project (>5000 < 10^6 t CO_{2eq} / a) ☐ Micro project (< 5000 t CO_{2eq} / a) ☐ AFOLU project ☐ Grouped project ☐ No specific project category			
VCS MR dated	Draft:	2011-02-09	Final:	2011-08-09
Applied Methodology	AMS III.M., Version02 "Reduction in Consumption of Electricity by Recovering Soda from Paper Manufacturing Process"			
Project starting date	2006-03-02			
Crediting period	☐ Renewable Crediting Period (7 y) ☒ Fixed Crediting Period (10 y)			
Start of crediting period	2006-03-28			

1.3.2 Project Location

The details of the project location are given in table 1-2:

Table 1-2: Project Location

No.	Project Location
Host Country	India
Region:	Punjab
Project location address:	Village Rupana, district Muktsar
Latitude:	30° 28'43'' North
Longitude:	74° 31'22''East

1.3.3 Technical Project Description

SIL is one of the leading integrated paper manufacturing unit in Punjab with daily production of 130 Tons per day (TPD) of paper. SIL, being an environmentally concerned organization has always been on the lookout for protecting the environment from degradation. Thus the proponent commissioned a chemical recovery plant in SIL's plant premises at Muktsar, Punjab with the ultimate objective to reduce the GHG emissions in the atmosphere.

The purpose of the project activity is to recover the caustic soda from waste black liquor generated at the pulping stage of the paper manufacturing process. Since the electricity consumption for the process of recovery of 1 tonne of soda is much lesser than that consumed in the production of fresh stock of soda.

The project would help curb the GHG emissions into the atmosphere. The electricity consumed at project activity is generated inhouse from biomass based power project.

The key parameters of the project are given in table 1-3:

Table 1-3a: Technical data of the project

Parameter	Unit	Value
Capacity	Ton/day	35
Annual working days	Days	330
Total Power Consumption	kWh/ton	800
Lime Requirement	Ton/Ton	1.50

Table 1-3b: Parameters confirmed during verification

Parameter	Name	Unit	Value
Quantity of Soda recovered	$Q_{sodarecovered}$	Tons	20163.83
Quantity of fossil fuel consumed for thermal energy	Q_{ffy}	Tons	1156.54
Electricity consumed in producing soda by recovery process	E_{pt}	kWh	12633132
Annual Electricity consumed in producing 1 ton of soda by soda manufacturers	E_{bt} (ex-post)	kWh	2008-09: 2608 2009-10: 2634 2010-11: 2654
Quantity of Residues Produced by the Plant	$Q_{residue}$	Tons	25892.45

1.3.4 Appointment of team members and technical reviewer

On the basis of a competence analysis and individual availabilities a verification team was appointed. Furthermore also the personnel for the technical review and the final approval was determined.

The list of involved personnel, the tasks assigned and the qualification status are summarized in the table 1-4 below.

Table 1-4: Involved Personnel

	Name	Company	Function [1]	Qualification Status [2]	Scheme competence [3]	Technical competence [4]	Verification competence	Host country Competence	Team Leading competence
☒ Mr. ☐ Ms.	Pankaj Mohan	TUV India Pvt. Ltd.	TL	SA	☒		☒	☒	☒
☒ Mr. ☐ Ms.	Prakash Kumar Mishra	TUV India Pvt. Ltd.	TM[A)]	A	☒		☒	☒	☐
☐ Mr. ☒ Ms.	Arshi Vimal	TUV India Pvt. Ltd.	TM[A)]	A	☒		☒	☒	☐
☒ Mr. ☐ Ms.	Manoj Kumar Borekar	TUV India Pvt. Ltd.	TM[A)]	SA	☒	AE	☒	☒	☒
☒ Mr. ☐ Ms.	Robert Cheong	TUV Nord cert GmbH	TR[B)]	LA	☒	AE	☒	☐	☒
☒ Mr. ☐ Ms.	Saroj Sahoo	TUV India Pvt. Ltd.	OR[B)]	LA	☒		☐	☒	☒
☐ Mr. ☐ Ms.	Ingo Klein	TUV Nord cert GmbH	FA[B)]	SA	☒		☒	☐	☒

1) TL: Team Leader; TM: Team Member, TR: Technical review; OT: Observer-Team, OR: Observer-TR; FA: Final approval

2) GHG Auditor Status: A: Assessor; LA: Lead Assessor; SA: Senior Assessor; T: Trainee; TE: Technical Expert

3) GHG auditor status (at least Assessor)

4) As per S01-MU03 or S01-VA070-A2 (such as 1.1, 1.2, …)

A) Team Member: GHG auditor (at least Assessor status), Technical Expert (incl. Host Country Expert or Verification Expert), not ETE

B) No team member

1.4 Level of Assurance

The verification has been planned and organized to achieve a

☒ reasonable level of assurance

☐ limited level of assurance.

2 METHODOLOGY

The verification of the project consisted of the following steps:

- Contract review
- Appointment of team members and technical reviewers
- Publication of the monitoring report
- Desk review of the Monitoring Report/MR/ submitted by the client and additional supporting documents.
- Verification planning,
- On-Site assessment,
- Background investigation and follow-up interviews with personnel of the project developer and its contractors,
- Draft verification reporting
- Resolution of corrective actions (if any)
- Final verification reporting
- Technical review
- Final approval of the verification.

The sequence of the verification is given in the table 2.1 below:

Table 2.1: Verification sequence

Topic	Time
Assignment of verification	2010-10-15
On-site visit	2011-02-22 and 2011-02-23
Draft reporting finalised	2011-03-22
Final reporting finalised	2011-09-08
Technical review on final reporting finalised	2011-09-08
Final corrections	2011-09-08

The main verification steps are described below.

2.1 Review of Project Documentation

The VCS PD /PD/ and supporting background documents related to the project design and baseline were reviewed.

Furthermore, the verification team used additional documentation by third parties like host party legislation, technical reports referring to the project design or to the basic conditions and technical data.

The references used in the course of this verification are summarized in section 5.

2.2 On-Site Assessment

2.2.1 Review of Performance Records

During the site visit calibration records/certificates of the flow meters, Electricity meters (in recovery plant (CRP boiler), vaporisation plant, caustisizing plant installed at site were verified and found that the monitoring period from 2008-11-01 to 2010-08-31 is covered by the calibration records. Electricity requirement of project activity in soda recovery process is met from biomass based captive power plant and hence project emission from the electricity consumption is accounted as zero. Biomass based power plant, associated with project activity, was physically verified, personnel at power plant were interviewed/IM01/ and log sheet/LOG/ maintained at the power plant was also verified during the onsite visit. Moreover an undertaking/UND/ is provided by PP that the project activity is solely dependent on the biomass based captive power plant for electricity requirement and biomass based power plant is not claiming credits under any GHG emission reduction schemes. The log sheets and electricity bills/ELE/ are also properly maintained by the project proponent as checked during onsite observation. Electricity bills are verified only to ensure that there is ample power generation by biomass based captive power plant and to ensure that there is no double counting by accounting project emission as zero. Verification team also collected the copies of calibration certificates, electricity bills, purchase orders of the equipments; baseline data records such as annual reports/AR/ for electricity consumed in producing 1 ton of soda by soda manufacturer log sheets and physically checked the project boundary as well. The records were found to be satisfactory.

2.2.2 Follow-up Interviews

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS.

During verification the verification team has performed interviews to confirm selected information and to resolve issues identified in the document review. The main topics of the interviews are summarized in Table 2-2.

Table 2-2: Interviewed persons and interview topics

Interviewed Persons / Entities	Interview topics
Project proponent representatives (IM01) Project consultant (IM02)	- General aspects of the project - Technical equipment and operation - Changes since validation - Monitoring and measurement equipment - Remaining issues from validation / previous verifications - Calibration procedures - Quality management system - Involved personnel and responsibilities - Training and practice of the operational personnel - Implementation of the monitoring plan - Monitoring data management - Data uncertainty and residual risks - GHG calculation - Procedural aspects of the verification - Maintenance - Environmental aspects - Editorial issues of the Monitoring Report

A comprehensive list of all interviewed persons is part of section 5 'References'.#

2.2.3 Collection of Measurements

The procedures of monitoring of all the parameters are described as below:

1. *Quantity of soda recovered in the process* - is achieved through the calibrated flow meter installed at site provides the reading of soda recovered in cubic meter. But monitoring of soda recovery is in tones, is calculated based on the strength of the Soda in white liquor in gram per 1000 ml (gpl) of liquid soda. Strength of soda recovered is determined in house laboratory. Records/LOG/ for the same is maintained which was verified during onsite visit is found appropriate. The value of gpl multiplied with the flow in $m^3$and divided by 1000 gives the value in tones. The flow meter is also connected with (DCS). This is recorded in the log books and reporting is done on the daily / monthly basis. The meter is providing the flow data of machines, monitored as a real-time entity. DCS provides a snapshot of the daily/monthly flow, as metered at the project site. The log book monitoring and calibrated meters provides a back-up (fail safe measure) in case the monitoring is not carried out or fails to function through DCS.

2. *Annual Electricity consumed to recover soda in recovery* plant - is achieved by way of the calibrated energy meters. The metering equipment is maintained in accordance with the electricity standards and is calibrated annually. The Meter Readings taken at this metering system for each month as well whole monitoring period. Consumption of electricity for soda recovery process is supplied by the in house biomass based captive power plant and hence emission from the consumption of electricity in soda recovery is taken zero. Biomass based power plant, associated with project activity, was physically verified, personnel at power plant were interviewed/IM01/ and log sheet/LOG/ maintained at the power plant was also verified during the onsite visit. Moreover an undertaking/UND/ is provided by PP that the project activity is solely dependent on the biomass based captive power plant for electricity requirement and biomass based power plant is not claiming credits under any GHG emission reduction schemes.
3. *Annual Electricity consumed in producing 1 tonne of soda by the soda manufacturer during the crediting period .is monitored ex-post*, from the annual published data of soda manufacturer/AR/. Moreover the determination of electricity consumed in producing 1 tone of soda is calculated based on last three consecutive years average values compared with current years value and conservative among the two values are used to calculate the emission reduction. The values used for the emission reduction calculation are checked from the annual report and found to be correct. This is found to be conservative and also in accordance with the applied methodology AMS III. M. version 02.
4. *Quantity of fossil fuel i.e. furnace oil consumed for thermal energy generation in the soda recovery process* is monitored by standard, calibrated measuring scale. The quantity of furnace oil in kiloliter (kl) is multiplied by specific gravity to arrive at monitored value in tonnnes/annum. Supporting evidence i.e. laboratory chemical test report/TR/ for specific gravity of furnace oil dated 2009-04-05 submitted by PP was verified and found to be corrected. Moreover the verification team also checked cross checked the value of specific gravity of FO from the Bureau of Energy Efficiency publication[1] and found to be appropriate. Plant log books and records/LOG/ are also found to be appropriately maintained at site by verification team during on site assessment.
5. *Emission factor of the fossil fuel used for generating thermal energy* is calculated based on IPCC default value. The same was cross checked from the IPCC 2006 and found to be correct.
6. *Quantity of residues produced from the recovery plant is measured* by calibrated weigh bridge. The same was checked during the onsite visit and interview/IM01/ with the operational personnel and PP. The log sheet for the quantity of residue was found to be maintained at plant site which was checked and found to be ok.

[1] Chapter 2.1 of energy managers training book available on link “http://www.em-ea.org/Guide%20Books/book-2/2.1%20Fuels%20and%20combustion.pdf”

7. *% residue used for the production of lime* was verified by physical inspection of the site, interview with the operational staff and PP and it was found that there is no lime production from the residue generated from the recovery of soda. Residue produced is used for land fill and hence found in coherence with the validated VCS PD[/PD/]. Moreover, an undertaking[/UND/] that no lime is produced from the residue generated from soda recovery within and outside the project boundary.
8. As verified during the onsite assessment and also undertaking that 100% of residue produced is dispose off in land fill.

2.2.4 Observation of established practices and testing of the accuracy of monitoring equipment

The established practice is that the project proponent is recording the data from the calibrated meters in the log book as observed during the site visit by the verification team. The accuracy of monitoring / measuring equipments installed at site were checked by checking the calibration certificates and obtaining the copies of the same.

2.3 Determination of the reductions in GHG emissions

The emission reductions are calculated on the basis of the meter readings at the project location. The electrical meters are locked and thus are tamper free. In order to ensure the highest levels of accuracy the monitoring instruments are calibrated yearly as per the manufacturers' specifications. Other than this, several documents like annual reports[/AR/] published by soda manufacturers, electricity bills[/ELEC/], calibration certificates[/CAL/] of electricity meters, flow meter, measuring scale and weigh bridge were submitted by the project participant as evidence to determine emission reductions and to cross check the values. These values were verified from the log sheets/plant records and validated PD[/PD/] and the verification team is satisfied with the quality of the evidence used to determine emission reductions. All the evidences are also listed in table 5-1 of this report.

2.4 Review of additional data from other sources if appropriate

Quantity of Furnace oil used is cross checked from the invoices[/INV/] and found to be appropriate. Net quantity of soda recovered is calculated based on measured value of white liquor by flow meter. Flow meter is working properly as checked during onsite visit and calibration details provided. Test report of strength of soda[/GPL/] is found maintained at plant site which was verified during the onsite assessment and appropriate. Calibration records of Weigh Bridge and measuring scale were also verified and found acceptable by the verification teamIPCC 2006 data was used to calculate the Emission factor of the Furnace Oil.

2.5 Review of monitoring results and verification of the correct application of monitoring methodologies

The verification team has carried out interviews in order to assess the information included in the project documentation and to gain additional information regarding the compliance of the project with the relevant criteria applicable for the VCS.

2.6 Resolution of any material discrepancy

Material discrepancies identified in the course of the verification are addressed either as CARs, CLs or FARs.

A **Corrective Action Request (CAR)** is established where:

- mistakes have been made in assumptions, application of the methodology or the project documentation which will have a direct influence the project results,
- the requirements deemed relevant for verification of the project with certain characteristics have not been met or
- there is a risk that the project would not be registered or that emission reductions would not be able to be verified and certified.

A **Clarification Request (CL)** will be issued where information is insufficient, unclear or not transparent enough to establish whether a requirement is met.

A **Forward Action Request (FAR)** will be issued when certain issues related to project implementation should be reviewed during the first verification.

A detailed list of the CARs CLs and FAR raised and discussed in the course of this verification is included in the next section 3 of this report.

3 VERIFICATION FINDINGS

In this section the assessments and findings from the desk review of the VCS PD, site visit, interviews and supporting documents as well as the final assessments are summarised. Table 3-1 includes an overview of all raised CARs, CLs and FARs.

Table 3-1: Overview of CARs, CLs and FARs issued

No.	Topic / Chapter	CAR	CL	FAR
3.1	Remaining issues, including any material discrepancy	**0**	**0**	**0**
3.2	Project implementation	**0**	**0**	**0**
3.3	Completeness of monitoring	**5**	**1**	**0**
3.4	Accuracy of emission reduction calculations	**1**	**0**	**0**
3.5	Quality of evidence to determine emission reductions	**0**	**1**	**0**
3.6	Management and operational system	**0**	**0**	**0**
-	**SUM**	**06**	**02**	**0**

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

Description

There are no remaining issues from the validation and/or verification. This was checked from the validation and verification report and final validated PD and MR.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

Final Assessment

There are no remaining issues including any material discrepancies found from the previous validation and first verification.

3.2 Project implementation

Description

SIL is one of the leading integrated paper manufacturing units in Punjab with daily production of 130 Tons per day (TPD) of paper. The purpose of the project activity is to recover the caustic soda from waste black liquor generated at the pulping stage of the paper manufacturing process. The weak black liquor is evaporated (in Evaporation plant) and burned in the recovery boiler to recover the soda for reuse in the pulping process. Each component involved in project activity such as, evaporation plant, recovery boiler, smelt dissolver and Causticizing Plant were physically verified and found properly functional during the onsite observation. Proper functioning and monitoring was verified in online data monitoring system i.e. DCS.
Snap shot and photos were taken also taken during the verification. All measuring equipments are also connected to DCS. The electricity consumption for the process of recovery of 1 tone of soda is much lesser than that consumed in the production of fresh stock of soda. Electricity consumption in the recovery of soda is being monitored by calibrated energy meters, quantity of soda recovered is measured by calibrated flow meter as stipulated in the VCS PD/PD/ and quantity of furnace oil used for thermal energy generation in recovery process by duly calibrated measuring scale as verified during the course of verification. As per the onsite assessment and interview it was found that no relevant equipments have been exchanged/replaced. Hence verification team concludes that the project has been implemented as described in the validated VCS Project Description/PD/.

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

Final Assessment

The project has been implemented as described in the validated VCS Project Description/PD/. No CARs, CLs or FARs were raised during the course of verification.

.

…

☐ …

3.3 Completeness of monitoring

Description

The monitoring report/MR1/has outlined the monitoring of the project over the period (2008-11-01 to 2010-08-31). The submitted monitoring report/MR1/ which forms the basis of the verification was prepared by summarizing consolidated data over the whole monitoring period in accordance with the monitoring plan of the validated VCS PD/PD/. The report is in line with the requirements of the monitoring plan of the validated VCS PD/PD/as well as with the applied methodology AMS III.M. Detailed assessment of all the monitoring parameters are provided in section 2.3.2 of this report.
Version 02/AMS III.M./. Moreover during the course of verification 05 CARs and 01 CL were raised and closed successfully.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	**3.3-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Monitoring report/MR1/ does not mention under which standard and version the project is under second periodic verification.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Details related to the standard used and also the approved methodology for verification have been included in the revised monitoring report		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Revised Monitoring Report/MR2/ was checked by the verification team and found VCS standard and version number included therein, hence CAR is successfully closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	**3.3-2**		
Classification	☒ CAR	☐ CL	☐ FAR

Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	1. Meter details e.g. accuracy class, and calibration certificate numbers are missing in the monitoring report. 2. Please explain the acronyms used throughout in the Monitoring report e.g. GPL etc. 3. All the tables, figures and sections provided in the monitoring report/MR/ should be numbered and captioned. Kindly also correct the section "Parameters Monitored" numbered as B.7.1 on page no. 6 of the VCS monitoring Report/MR1/. 4. Please correct the unit for parameter $Q_{ff\,Y.}$ 5. Section 3.3 and 3.4 are given as references under QA/QC procedure to be applied in the VCS Monitoring Report/MR1/ which could not be found. Kindly justify the same. 6. Kindly correct the symbol/notification of formula used in baseline emission calculation and also make the same in accordance with the applied methodology. 7. Energy meter serial number of evaporatoris not correct in the MR as checked during site visit.
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	1. Calibration certificate number for the entire monitoring period has been included in the revised monitoring report. However, the accuracy class was already mentioned in the report. 2. The acronyms have been explained in the revised monitoring report 3. All tables and figures in the monitoring report have been numbered . Further , relevant corrections have been made in the revised monitoring report 4. The unit for parameter $Q_{ff\ Y}$ has been corrected to litres in the revised monitoring report. 5. It was a typographical error, same has been corrected in the revised monitoring report. 6. The symbol/ notification has been corrected as per the applied methodology. 7. Same has been corrected in the revised monitoring report.

DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	1. Verification team has checked the revised MR and found that the calibration certificate numbers, and accuracy class of the meters are now incorporated in a separate table, the details are also cross verified with the calibration certificates provided by the PP. CAR point is closed. 2. VT checked the revised MR and found that the acronyms have been explained clearly. CAR point is closed. 3. VT checked that the section "Parameters Monitored" earlier numbered as B.7.1 on page no. 6 of the VCS monitoring Report is now corrected however; all tables and figures are still not numbered and captioned properly, please rectify the same. CAR point is open. 4. VT checked that the unit for the monitoring parameter $Q_{ff\ Y}$ is corrected to litres from tonne in the revised MR. CAR point is closed. 5. VT checked that the section 3.3 and 3.4, given as references under QA/QC procedure under section 'parameters monitored' are removed from the revised MR and also correct referencing is provided in place of the same in the revised monitoring report. CAR point is closed. 6. VT checked that the symbols/notifications of formula used in baseline emission calculation are corrected and as per the applied approved methodology AMS III.M. version 02, in the revised monitoring report, hence CAR point is successfully closed. VT checked that the electricity meter number of evaporator is now corrected in the revised MR. CAR point is closed.
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	All tables and figures have been numbered and captioned in the revised monitoring report
DOE Assessment #2	Verification team checked the revised MR and found all the tables and figures are numbered and captioned. Hence CAR point no. 3 is successfully closed.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	**3.3-3**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Although replacement of electricity meter of CRP boiler is not in the current monitoring period however as per MR/MR1/, onsite observation and interview it was found that electricity meter of CRP boiler has been replaced with the new electricity meter having meter No. 156228/32607-3008. A description of the cause of replacement of the meter is missing in the MR.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Since the LCD of old meter was not working properly on 22.8.2008, the meter was changed.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	The reason for the change of meter is still not mentioned in the monitoring report. CAR is open.		
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details*	Same has been included in the table containing the calibration details in the MR.		
DOE Assessment #2	Revised monitoring report was found described with the justification of replacement of electricity meter of CRP boiler. Justification for change in meter is found in coherence with the onsite observation and interview performed by the verification team. CAR is successfully closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Finding:	**3.3-4**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Description of measurement method of Monitoring parameter “quantity of soda recovered” is not in line with the validated VCS PD and previous verified Monitoring report/V01/.		

Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The parameter "quantity of soda recovered "is a measured parameter and not calculated. Same has been corrected in the revised monitoring report.
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	VT checked the revised monitoring report and found that the description of measurement method of Monitoring parameter "quantity of soda recovered" is corrected to 'measured' and now in line with the validated PD. However the monitored value is calculated based on measured value of flow meter. Determination of the strength in gram per litre by in house lab was found appropriate by the verification team. Hence CAR is successfully closed.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	**3.3-5**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Linkage is not provided for daily and monthly data in the worksheet.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The values are already linked in the emission reduction sheet		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	As per the site visit, verification team cross checked the daily data of quantity of fossil fuel consumed, electricity consumption, quantity of soda etc. with the log books, which is not reflecting in the emission reduction calculation spread sheet, same has to be incorporated in the sheet and the linkage between daily and monthly data is to be done. CAR is open.		

Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Daily data of quantity of fossil fuel consumed, electricity consumed for soda recovered and quantity of soda recovered is now been linked with the monthly data sheet.
DOE Assessment #2	Linkage is found provided for daily and monthly data in the revised worksheet. CAR is closed successfully.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Finding:	**3.3-6**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Parameter E_{BT} (ex-post) is not found in line with the validated VCS PD and previous verified monitoring report[/V01/]. Kindly clarify the same.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	At the time of PD preparation and previous verification, the annual report for PACL for the year 2008-09 was not available thus the value of power consumption for recovering 1 tonne of caustic soda (this value is required for calculating E_{BT} (ex-post), refer CER excel sheet for previous verification) for the year 2008-09 was taken same as that of the previous year i.e 2007-08. However, during current verification the 2008-09 annual report was available and hence the actual value given in the annual report of power consumption for recovering 1 tonne of caustic soda was used to calculate E_{BT} (ex-post). Due to this reason there has been some discrepancies in the value of this parameter in PD and previous verified monitoring report when compared to that of current monitoring report.		
DOE Assessment #1 *The assessment*	Please provide the data source taken for parameter E_{BT} as mentioned in monitoring report for the complete verification period.		

<table>
<tr><td>shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.</td><td>CAR is open.</td></tr>
<tr><td>Corrective Action #2
This section shall be filled by the PP. It shall address the corrective action taken in details.</td><td>The annual report for SIEL (subsidiary of Mawana Sugars) and PACL (Punjab Alkalies and Chemicals Limited) (provided as Annexure 1) publishes the power consumption of per tonne of soda recovered for the year 2008-09 and 2009-10.The same has been provided as Annexure 1.

Further due to non availability of the annual report for the year 2010-11, the values of the year 2009-10 have been used for the same.

The value of the parameter E_{BT} is being calculated using these values,

The calculation procedure is as explained below:

<table>
<tr><th>Year</th><th>Manufacturer</th><th>Power consumption (KWh) / tonnes</th><th>Quantity (tonnes)</th></tr>
<tr><td rowspan="4">2008-09</td><td></td><td></td><td></td></tr>
<tr><td>PACL</td><td>2632</td><td>3220</td></tr>
<tr><td>SIEL</td><td>2641</td><td>1473</td></tr>
<tr><td>Weighted Average</td><td>2635</td><td></td></tr>
</table>

The weighted average is calculated as:

=(Total power consumption (in KWh) of both PACL & SIEL)/(total quantity produced by PACL & SIEL)

=(2632*3220+2642*1473)/(3220+1473)

Same approach has been used for each year.

<table>
<tr><th>Year</th><th>Manufacturer</th><th>Power consumption (KWh) / tonnes</th><th>Quantity (tonnes)</th></tr>
<tr><td>2009-</td><td></td><td></td><td></td></tr>
</table>
</td></tr>
</table>

	10	PACL	2670	3954
		SIEL	2613	457
		Weighted Average	2664	

Year	Manufacturer	Power consumption (KWh) / tonnes	Quantity (tonnes)
2010-11			
	PACL	2670	1970
	SIEL	2613	254
	Weighted Average	2663	

The weighted average for these values of the power consumption of per tonne of soda recovered has been calculated and

The average of these weighted average values of each year was calculated as 2654 (=(2635+2664+2663)/3)

This value is then compared with each year's power consumption for production of 1 tonne of caustic soda (weighted average value), and the conservative of the two is taken for final calculation.

kindly refer the excel sheet "Baseline-Electricity consump" for further clarification on the calculations.

DOE Assessment #2	Verification team checked the revised emission reduction calculation spread sheet and found that the calculated value of annual electricity consumed in producing one ton of soda is conservative and the monitoring parameter E_{BT} is now inline with validated PD and hence acceptable. CAR 3.3-6 is successfully closed.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

Five CARs and one CL were raised on the section completeness of monitoring, which were successfully closed after checking the revised monitoring report/MR2/ and other documents like emission reduction calculation spread sheet/xls2/, annual report for SIEL (subsidiary of Mawana Sugars) and PACL (Punjab Alkalies and Chemicals Limited), calibration certificates etc. provided by project proponent.

3.4 Accuracy of emission reduction calculations

Description

The monitoring reports/MR1/ has been found to be in line with the validated VCS PD/PD/ and also uses the same parameters as mentioned in validated VCS PD. Monitoring report and ER calculation spreadsheet applied the correct formula for Emission reduction calculation and found in accordance with the applied methodology, AMS III M version 02.
Calculated emission reductions of 39031 t CO_2e for the period of 2008-11-28 to 2010-08-31 (including both the days) has been verified and found to be true, real and accountable.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	**3.4-1**		
Classification	☒ CAR	☐ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	Baseline emissions mentioned in the MR and Emission reduction calculation spreadsheet is not consistent. Moreover baseline emission, project emission and emission reduction calculation process in detail are missing in monitoring report		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The round off figure of baseline emission is mentioned in the monitoring report. Further, the base line emission, project emission and an emission reduction calculation detail has been included in the revised monitoring report.		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Still consistency of baseline emissions between monitoring report and emission reduction calculation spread sheet is lacking. CAR is open.		

Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	The value of baseline emission , project emission and emission reduction has been made consistent throughout the monitoring report and the emission reduction sheet.
DOE Assessment #2	Revised MR and ER calculation spread sheet submitted by PP was verified by the verification team and found the baseline emissions, project emissions and emission reductions calculation, provided, is consistent. Hence CAR 3.4-1 is successfully closed.
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements

Final Assessment

One CAR was raised on the baseline emissions which was successfully closed after the relevant corrections in the revised monitoring report[/MR2/] and emission reduction calculation spread sheet[/XLS2/].

The Project Proponent compared the estimated emission reductions with the applied monitoring period accrued emission reductions in the monitoring report. Comparison is being done for 22 months as the applied monitoring period is for 22 months i.e. from 2008-11-01 to 2010-08-31. Accrued emission reductions are less than the estimated emission reductions in the approved VCS PD, hence found appropriate by verification team.

3.5 Quality of evidence to determine emission reductions

Description

In order to ensure the highest levels of accuracy the monitoring instruments are calibrated regularly as per the manufacturers' specifications. The white liquor production, power consumption, Furnace Oil consumption are recorded daily in the plant log books which are reviewed, verified and finally approved by the Director of the company. Other than this, receipt of furnace oil purchase[/INV/], electricity bills[/ELE/], calibration certificates[/CAL/] of involved equipments such as energy meters, flow meter, weigh bridge and measuring scale were submitted by the project participant as evidence to determine emission reductions and to cross check the values. These values were cross checked and the verification team is satisfied with the quality of the evidence used to determine emission reductions.

Related Findings

☐ No CARs, CLs or FARs have been identified in this context

☒ The following finding(s) have been addressed:

Finding:	**3.5-1**		
Classification	☐ CAR	☒ CL	☐ FAR
Description of finding *Describe the finding in unambiguous style; address the context (e.g. section)*	PP is requested to provide the calibration certificate of measuring scale.		
Corrective Action #1 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Same has been provided as annexure 1		
DOE Assessment #1 *The assessment shall encompass all open issues. In case of non-closure, additional corrective action and DOE assessments (#2, #3, etc.) shall be added.*	Calibration certificate for weigh bridge is not found. CL is open.		
Corrective Action #2 *This section shall be filled by the PP. It shall address the corrective action taken in details.*	Same has been attached as Annexure 2		
DOE Assessment #2	All the calibration certificates such as for energy meters, flow meter, measuring scale, weigh scale and weigh bridge submitted by PP are verified and found appropriate for the complete monitoring period i.e. from 2008-11-01 to 2010-08-31. Meter no. and calibration dates are provided in table 5-1 of this report. CL 5.3-1 is closed.		
Conclusion *Tick the appropriate checkbox*	☐ To be checked during the first periodic verification ☒ Appropriate action was taken ☒ Project documentation was corrected correspondingly ☐ Additional action should be taken ☒ The project complies with the requirements		

Final Assessment

Quality of evidences to determine the emission reduction is found appropriate and hence acceptable. Moreover during the course of verification CL 3.5-1 is raised and closed successfully.

3.6 Management and operational system

Description

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

Related Findings

☒ No CARs, CLs or FARs have been identified in this context

☐ The following finding(s) have been addressed:

Final Assessment

The verification team can state with reasonable assurance that the management and operation system implemented for the project is adequate and in line with the validated VCS PD[/PD/].

…

☐ …

4 VERIFICATION STATEMENT

Satia Industries Ltd. (SIL) has commissioned the TÜV NORD JI / CDM Certification Program to carry out the verification of the Project “Chemical Recovery project at Satia Industries Ltd. (SIL), formerly known as Satia Paper Mills Ltd. , village Rupana, Punjab” in Muktsar, Punjab, India with regard to the requirements of VCS 2007.1 Standard.

The project activity involves The project activity involves recovery of Soda and utilization of the same in the industry and compensates the soda purchase from the open market in the baseline. This project activity also resulted in recycling of white liquor used in the paper industry.

Reporting period: From 01-11-2008 to 31-08-2010

In the course of the verification 06 Corrective Action Requests (CARs), 02 Clarification Requests (CLs) were successfully closed.

The verification is based on the draft monitoring report, revised monitoring report, the monitoring plan as set out in the validated PD, the validation report, emission reduction calculation spreadsheet and supporting documents made available to the TÜV NORD JI/CDM CP by the project participant.

In detail the conclusions can be summarised as follows:

- all operations of the project are implemented and installed as planned and described in the validated project description.
- the monitoring plan is in accordance with the applied approved methodology ,ie, AMS III.M., Version02
- the installed equipment essential for measuring parameters required for calculating emission reductions is calibrated appropriately.
- the monitoring system is in place and functional. The project has generated GHG emission reductions.

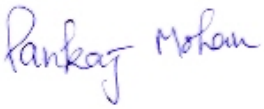
As the result of the 1st periodic verification, the verifier confirms that the GHG emission reductions are calculated without material misstatements in a conservative and appropriate manner. TÜV NORD JI/CDM CP herewith confirms that the project has achieved emission reductions in the above mentioned reporting period as follows:

Project emissions	3604 t CO2 equivalents
Baseline emissions	42635 t CO2 equivalents
Emission reductions	**39031 t CO2 equivalents**

Year wise emission reductions:

Year	Emission reductions
2008	3730
2009	18133
2010	17168

Delhi, 2011-09-08



TÜV NORD JI/CDM Certification Program

Verification Team Leader

Pankaj Mohan

Essen, 2011-09-08

TÜV NORD JI/CDM Certification Program

Final Approval

Ingo Klein

5 REFERENCES

Table 5-1: Documents provided by the project participant

Reference	Document
/AR/	Annual Reports of PACL and SIEL for the year 2006-2007, 2007-2008, 2008-2009. As the proof of electricity consumed to produce 1 ton of soda.
/CAL/	Calibration records for the key instruments and measuring devices: • Calibration certificate of Flow meter to measure recovered soda, no. 8813721 – 9000 associated with CRP dated 24/09/2008, 22/09/2009, 21/09/2010 • Calibration certificates of energy meters no. 5859750 associated with CRP Boiler dated 4/3/2008 and 156228/32607-3008 (new meter) dated 22/7/2009 and 28/6/2010. • Calibration certificate of measuring scale for measurement of furnace oil, no. 401 dated 8/10/2008, 6/10/2009 and 21/09/2010 • Calibration certificate of weigh bridge for residue produced, no. 0610002 dated 21/7/2008, 23/09/2009 and 29/6/2010. • Calibration certificate of energy meter no. 5859743 associated with caustisizing plant dated 4/3/2008, 2/3/2009 and 1/3/2010 • Calibration certificate of energy meter no. 1K040562 associate with evaporator dated 4/3/2008, 2/3/2009 and 1/3/2010
/CON/	The signed contract between TUV NORD and SIL for carrying out verification of voluntary emission reduction dated 2010-10-15.
/ELE/	Electricity Bills of the Satia Paper Industry as a whole for the complete monitoring period i.e. from 2008-11-01 to 2010-08-31.
/INV/	Copies of invoices for furnace oil used in CRP boiler.
/LOG/	• Log books of the electricity consumption for the verification period 2008-11-01 to 2010-08-31. • Log books of soda recovered for the verification period 2008-11-01 to 2010-08-31. • Log books of fuel oil consumption for the verification period 2008-11-01 to 2010-08-31.
/MR1/	Monitoring Report “Chemical Recovery project at Satia Industries Limited (SIL), Punjab, India. For the period 2008-11-01 to 2010-08-31,

Reference	Document
	version1 dated 2011-02-09
/MR2/	Monitoring Report "Chemical Recovery project at Satia Industries Limited (SIL), Punjab, India. For the period 2008-11-01 to 2010-08-31, version 3 dated 2011-08-09
/PD/	Project Description for project: "Chemical Recovery project at Satia Industries Limited (SIL), Punjab, India. Version 4 dated 2009-11-16.
/PO/	Purchase order of all the equipments (Plant) dated 2004-11-29.
/TR/	Laboratory test report for specific gravity of FO and strength of soda recovered.
/UND/	• Undertaking for not producing lime from the residue • Undertaking that project activity is consuming electricity from biomass based power plant which is not claiming emission reductions under any emission reduction scheme.
/XLS1/	Excel – Calculation sheets provided by the project participant (related to MR1).
/XLS2/	Excel – Calculation sheets provided by the project participant (related to MR2).

Table 5-2: Background investigation and assessment documents

Reference	Document
/AMS III M/	Approved CDM Methodology AMS III.M, Version02 "Reduction in Consumption of Electricity by Recovering Soda from Paper Manufacturing Process"
/CPM/	TÜV NORD JI / CDM CP Manual (incl. CP procedures and forms)
/IPPC/	1. 1996 IPCC Guidelines for National Greenhouse Gas Inventories: work book 2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories:

Reference	Document
	work book
/ISO 14064/	Greenhouse gases -- Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals Greenhouse gases -- Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements Greenhouse gases -- Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions
/ISO14065/	Greenhouse gases -- Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition
VCS	Voluntary Carbon Standard 2007.1
/VAL/	Final validation report of “Chemical Recovery project at Satia Industries Limited (SIL), Punjab, India.” dated 2009-11-19.
/V01/	Verification report of first periodic verification of Chemical Recovery project at Satia Industries Limited (SIL), Punjab, India.” dated 2010-09-16
/VCS PD/	Validated project description of Chemical Recovery project at Satia Industries Limited (SIL), Punjab, India. Dated 2009-11-16
/VDS-PD-T/	VCS PD Template
/VVM/	Validation and Verification Manual (EB 55 annex 1)

Table 5-3: Websites used

Reference	Link	Organisation
/bee/	http://www.em-ea.org/Guide%20Books/book-2/2.1%20Fuels%20and%20combustion.pdf	Bureau of Energy Efficiency
/cd4cdm/	www.cd4cdm.org	UNEP Riso Centre

Reference	Link	Organisation
/ipcc/	www.ipcc-nggip.iges.or.jp	IPCC publications
/vcs/	www.v-c-s.org	VCSA
/unfccc/	http://cdm.unfccc.int	UNFCCC

Table 5-4: List of interviewed persons

Reference	MoI[1]		Name	Organisation / Function
/IM01/	V	☒ Mr. ☐ Ms	Ajay Jindal	Satia papers
/IM01/	V	☒ Mr. ☐ Ms	Rishikant Singh	Satia Papers
/IM02/	V	☒ Mr. ☐ Ms.	Shashank Saxena	E&Y
/IM02/	V	☐ Mr. ☒ Ms.	Nidhi Bajaj	E&Y

[1] Means of Interview: (**T**elephone, **E**-Mail, **V**isit)