F-CDM-REG

CDM Project Activity Registration and Validation Report Form
(By submitting this form, designated operational entity confirms that the proposed CDM project activity meets all validation and registration requirements and thereby requests its registration)

Section 1: Request for registration	
Name of the designated operational entity (DOE) submitting this form	SGS United Kingdom Ltd.
Title of the proposed CDM project activity (Section A.2 of the attached CDM-PDD) submitted for registration	Raudi Chemical Salts
Project participants (Name(s))	Raudi Indústria e Comércio Ltda. (private entity, Brazil) Ecoinvest Carbon (private entity, Brazil)
Sector in which project activity falls	Scope 5 - Chemical Industries
Is the proposed project activity a small-scale activity?	Yes / **No**

Section 2: Validation report	
List of documents to be attached to this validation report (please check mark)*:*	

- ✔ The CDM-PDD of the project activity
- ✔ An explanation by the submitting designated operational entity of how it has taken due account of comments on validation requirements received, in accordance with the CDM modalities and procedures, from Parties, stakeholders and UNFCCC accredited non-governmental organizations;
- ❑ The written approval of voluntary participation from the designated national authority of each Party involved, including confirmation by the host Party that the project activity assists it in achieving sustainable development:
- ✔ Other documents, including any validation protocol used in the validation
  - ✔ List of documents attached clearly referenced
  - ✔ List of persons interviewed by DOE validation team during the validation process
  - ✔ Copies of documents reviewed during validation visit.
- ✔ Information on when and how the above validation report is made publicly available.
- ❑ Banking information on the payment of the non-reimbursable registration fee
- ❑ A statement signed by all project participants stipulating the modalities of communicating with the Executive Board and the secretariat in particular with regard to instructions regarding allocations of CERs at issuance.

Executive Summary and Introduction, including

- **Description of the proposed CDM project activity**
- **Scope of validation process (include all documentation that has been reviewed and name persons that have been interviewed as part of the validation, as applicable)**
- **DOE Validation team (list of all persons involved in the validation, describing functions assumed in the validation)**

Description of the proposed CDM project activity

This report summarizes the results of the validation of the project, performed on the basis of UNFCCC criteria. The validation has been performed as a desk review of the project documents presented by Raudi Indústria e Comércio Ltda and a site visit to the industrial unit, where staff from the company and its consultant were interviewed and additional information was obtained.

Raudi Indústria e Comércio Ltda is a company dedicated to the manufacturing of inorganic chemicals. The industrial unit is located at Rodovia PR 559 – km 05, São Carlos do Ivaí, Paraná, Brazil. The purpose of the project activity is to produce chemical salts, including sodium bicarbonate ($NaHCO_3$), ammonium bicarbonate (NH_4HCO_3) and calcium carbonate ($CaCO_3$), with residual renewable CO_2 that was previously released to the atmosphere derived from the fermentation of sugarcane juice from an ethanol distillery, instead of using the conventional processes that use non-renewable CO_2. The renewable CO_2 used in the project is supplied by Coopcana – Cooperativa Agrícola Regional de Produtores de Cana Ltda, an agricultural cooperative that controls an ethanol distillery, which processed 1,524,983 tonnes of sugarcane and produced 114,000 m³ of ethanol (data from year 2004).

The technology employed in the project activity is a new one, developed by Raudi. The CO_2 produced from the sugarcane fermentation at Coopcana is transported through a pipeline, from the ethanol distillery to the chemical salts plant. In the plant, the gas is filtered, cleaned and mixed with soda inside a chemical reactor, to produce the chemical salts. Raudi patent pending technology is under requirement #PI0002730-8, July 13, 2000 INPI – Brazil.

In the business as usual scenario, the CO_2 would be obtained from two different sources: Fossil CO_2 or mineral CO_2. In both cases, CO_2 is non-renewable. The project activity substitutes the source of CO_2, switching from non-renewable CO_2 to renewable CO_2, then the emissions of non-renewable CO_2 during the use of the chemical salts are avoided. In the absence of the project activity the conventional technology that use mineral or fossil sources of CO_2 as raw material would be applied.

Total amount of emission reductions estimated for the first crediting period is 119,960 tCO_2e.

Baseline Scenario:
Mineral or fossil sources of CO_2 (non-renewable) would continue to be used to produce chemical salts and non-renewable CO_2 emissions would be resulted from the use of these salts.

With-project scenario:
Production of chemical salts with residual renewable CO_2 derived from the fermentation of sugarcane juice at an ethanol distillery. Emissions reduction occur due to the avoidance of non-renewable CO_2 emissions.

Leakage:
As the residual CO_2 from the processing of biomass was already produced but was not used before the project activity, it was released to the atmosphere, leakage is zero.

Environmental and social impacts:
The project is not expected to result in negative environmental and social impacts.

The project activity was installed and has been implemented in accordance with all the applicable environmental requirements. The plant received the environmental license issued by the state environmental agency - Instituto Ambiental do Paraná (IAP) and the monitoring of project atmospheric emissions, wastewater generation and solid residues final disposal was approved by the environmental agency as of the issuance of the installation license.

Positive social impacts are identified as results of the project activity, as the development of new technologies that promotes the reduction of fossil carbon dependency in the chemical industry by using renewable carbon sources.

Scope
The scope of the validation is the independent and objective review of the project design document, the baseline study and monitoring plan and other relevant documents of the "Raudi Chemical Salts" project. The information in these documents is reviewed against the criteria defined in the Marrakech Accords (Decision 17) and the Kyoto Protocol (Article 12) and subsequent guidance from the CDM Executive Board.

The validation 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.

Overview of documentation that has been reviewed and names of persons that have been interviewed as part of the validation

Please refer to Annex 3.

DOE Validation team

Name	Role
Áurea Nardelli	Team leader / lead assessor
Fabian Gonçalves	Local assessor
Irma Lubrecht	Technical reviewer

Description of methodology for carrying out validation

- **Review of CDM-PDD and additional documentation attached to it**
- **Assessment against CDM requirements (e.g. by use of a validation protocol)**
- **Report of findings by the DOE, e.g. by use of type of findings (e.g. corrective action requests, clarifications or observations). Please explain the way findings are "labelled" during validation.**
- **Include statements or assessments in the section "Conclusions, final comments and validation opinion" below.**

Review of CDM-PDD and additional documentation

The validation was performed primarily as a document review of the publicly available project documents (see Annex 2 for the list of documents). The assessment was carried out by trained assessors using a validation protocol.

A site visit was required to verify assumptions in the baseline. Additional information was required to complete the validation, which was obtained through telephone, e-mail and face-to-face interviews with

the project developers and their consultants. These were performed by the local assessor, from SGS Brazil. The results of the site visit carried out on 6th April 2006 are summarized in Annex 6 to this report.

Assessment against CDM requirements

In order to ensure transparency, a validation protocol was customised for the project. The protocol shows, in a transparent manner, requirements, means of verification and the results from validating the identified criteria. The validation protocol serves the following purposes:

- it organises, details and clarifies the requirements the project is expected to meet; and
- it documents both how a particular requirement has been validated and the result of the validation.

The validation protocol consists of several tables. The different columns in these tables are described below.

Checklist Question	*Means of verification (MoV)*	*Comment*	*Draft and/or Final Conclusion*
The various requirements are linked to checklist questions the project should meet.	*Explains how conformance with the checklist question is investigated. Examples of means of verification are document review (DR) or interview (I). N/A means not applicable.*	*The section is used to elaborate and discuss the checklist question and/or the conformance to the question. It is further used to explain the conclusions reached.*	*This is either acceptable based on evidence provided (**OK**), or a **Corrective Action Request (CAR)** due to non-compliance with the checklist question (See below). **New Information Request (NIR)** is used when the validation team has identified a need for further clarification.*

The completed validation protocol for this project is attached as Annex 4 to this report.

Report of findings and use of type of findings.

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

Where insufficient or inaccurate information is available and clarification or new information is required the Assessor shall raise a **New Information Request (NIR)** specifying what additional information is required.

Where a non-conformance arises that requires the Project Developer to do something (for example correct something in the PDD) the Assessor shall raise a **Corrective Action Request (CAR).**

A CAR is issued, where:

I. mistakes have been made with a direct influence on project results;

II. validation protocol requirements have not been met; or

III. there is a risk that the project would not be accepted as a CDM project or that emission reductions will not be verified.

The validation 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 lead to a CAR. Observations may also be raised which are for the benefit of future projects and future verification or validation actors. These have no impact upon the completion of the validation or verification activity.

Corrective Action Requests and New Information Requests are raised in the draft validation protocol and detailed in a separate form (Annex 5). In this form, the Project Developer is given the opportunity to "close" outstanding CARs and respond to NIRs and Observations.
For this project, the *Corrective Action Requests (CAR)* and *New Information Request (NIR)* were closed out through communication between validation team , Raudi Indústria e Comércio Ltda staff and Ecoinvest consultant. Changes to the project design were necessary to clarify the issues raised.

Explanation by the submitting designated operational entity of how it has taken due account of comments on validation requirements received, in accordance with the CDM modalities and procedures, from Parties, stakeholders and UNFCCC accredited non-governmental organizations;

- **Description of how and when the PDD was made publicly available**
- **Description of how comments were received and made publicly available**
- **Explanation of how due account has been taken of comments received**
- **Compilation of all comments received (Identify the submitter)**

In accordance with the CDM modalities and procedures, the project design document of this proposed CDM project activity has been made publicly available and comments have been invited from Parties, stakeholders and UNFCCC accredited non-governmental organizations. This process is described in Annex 1 to this report, which is available as a separate document.

Conclusions, final comments and validation opinion

- **Provide conclusions on each requirement under paragraph 37 of the CDM modalities and procedures, describing how these requirements have been meet. This shall include assessments and findings (e.g. corrective action requests, clarifications or observations) in relation to each requirement, including a confirmation that all issues raised have been addressed to the satisfaction of the DOE.**
- **Final comments and validation opinion**

Participation requirements

Brazil is listed as the host Party. Brazil has ratified the Kyoto Protocol on 23rd August 2002. (http://unfccc.int/files/essential_background/kyoto_protocol/application/pdf/kpstats.pdf).

At time of the draft validation, no Letter of Approval from the host country had been provided.

The Brazilian DNA does not issue the letter of approval until the DOE validates the project. For this reason, project proponents asked the DOE to issue the validation report so that the approval of the host country can be requested. The Letter of Approval will be signed when the DNA of Brazil has received and analysed the validation report and documentation regarding the project.

Annex I Party participants are not identified yet.

Baseline and monitoring methodology

The methodology applied to the project is the AM0027 - *"Substitution of CO2 from fossil or mineral origin by CO2 from renewable sources in the production of inorganic compounds"* (version 01, 28th November, 2005).

AM0027 is applicable to industrial production processes of inorganic compounds where fossil or mineral sources of CO_2 are presently used as an input and where renewable sources of CO_2 are available as a substitute input in the project activity case. This is the case of Raudi project which is an industrial production process of inorganic compounds. Fossil or mineral sources of CO_2 are presently used as an input in other similar plants producing the same chemicals and renewable sources of CO_2 are available as a substitute input in the project activity.

The applicability of AM0027 is subject to the conditions listed below:

• The residual CO_2 from the processing of biomass was already produced but was not used before the project activity, so that no diversion of CO_2 from other applications is due to the project activity: In the case of Raudi project, the supplier - Coopacana ethanol distillery - operates since 1979. The CO_2 was produced before the project activity as a consequence of sugarcane juice fermentation for ethanol production and was released to the atmosphere.

• The processing of biomass undergoes no substantial changes in the process with the project activity: The processing of sugarcane at Coopacana distillery did not undergo any substantial change to produce CO_2 used by the project activity.

• CO_2 from fossil or mineral sources that is used for the production of inorganic compounds prior to the project activity will not be emitted to the atmosphere with the project activity: In Brazil, the alternative scenario for the production of inorganic compounds uses non-residual CO_2, obtained from synthesis gases and other fossil hydrocarbons. With the implementation of the project activity and use of renewable CO_2, fossil sources of CO_2 would not need to be generated and released to the atmosphere.

• There are no substantial changes in the production process of inorganic compounds as a result of the

project activity: No substantial changes that might result in differences in greenhouse gases emissions other than the raw material CO_2 are a result of the implementation of the project activity.

• Production levels of the plant (tons of inorganic compound produced per year) may in general not increase with the project activity over historic maxima: In the case of Raudi, the production increasing expected for the period is not a consequence of the project activity. The use of renewable CO_2 did not increase the production levels above the estimated levels of the plant.

• No additional significant energy quantities are required to prepare the renewable CO_2 from biomass processing for use in the production of inorganic compounds (related CO_2 emissions are below 1% of total emission reduction): The processing of sugarcane at the distillery did not undergo any substantial change to produce CO_2 used in Raudi plant. The levels of energy consumption did not change.

• All carbon in the produced inorganic compounds stems from the CO_2 supplied during the production process: it was described in the PDD that it is possible to implement the production route of sodium bicarbonate via soda ash: $Na_2CO_3 + CO_2 + H_2O \rightarrow 2\ NaHCO_3$
In the case of $NaHCO_3$ via Na_2CO_3, the CO_2 in Na_2CO_3 molecule is normally originated from the calcination of $CaCO_3$, a mineral non-renewable source of CO_2. Then non-renewable CO_2 is used together with renewable CO_2. To be in compliance with the AM0027 criteria, the value of *Kp* (correction factor for renewable CO_2 in the project activity) was considered in the estimative as 0.5.

The project boundary is consistent with the approved methodology.

The baseline emissions, project emissions, leakage and emissions reductions were determined in accordance with the methodology and were clearly described in the PDD.

Additionality

According to AM0027, the additionality of the project activity shall be demonstrated and assessed using the latest version of the "*Tool for the demonstration and assessment of additionality*".

The five steps were discussed and the relevant information to demonstrate the additionality of the project activity was presented in the PDD and assessed during the desk study and the site visit.
CAR 8 was raised related to the Sep 0 (starting date of the project design and construction) and regarding scenario 3 (it was not applicable to Raudi). The PDD was revised to present the correct information and CAR 8 was closed out.

It was concluded that the additionality criteria were satisfied and the project activity is additional.

Monitoring plan

The AM0027 requires the monitoring of the type of inorganic compound produced (to be performed annually after the start of project activity). During the desk study it was verified that the indicator n° 8 "Product" was not included in the table D.2.2.1 (PDD, section D). CAR 1 was raised. To close out the CAR, the PDD was revised and the item 8 was included in the monitoring plan (section D, PDD version 2).

Accordingly to the methodology, the main indicator to be directly monitored is the total amount of chemical produced. It should be measured using mass or volume meters at the plant site and should be cross-checked with an annual energy balance that is based on purchased quantities and stock changes. The sales receipts that contain the quantity sold may be used for cross-checking the total

amount of chemical produced.

The monitoring plan did not provided information about meters calibration and CAR 4 was raised.

During the site visit and by further contacts with the project proponents, it was possible to verify that the weigh bridge had been calibrated when installed and that there is an informal plan for periodic calibration. It was informed that Raudi is implementing its Quality Management System and the documented procedures for calibration and the calibration plan will be prepared and implemented in the next months. CAR 4 was closed out and an Observation was raised (see below).

During the desk study, It was verified that additional information about the monitoring plan were needed, as:
- potential unintended emissions and emergency procedures (NIR 3)
- training requirements (NIR 7)

During the site visit it was clarified that the only potential source of unintended emissions is the back-up CO_2 tanks. It was verified that there are controls in place to prevent accidents and leakage and in case of leakage, the amount of CO_2 can be calculated and will be accounted as project emissions. NIR3 was closed out.

Regarding training for monitoring tasks, it was verified that the controls required for the project activity are part of Raudi plant operational routine. Production data is obtained from the electronic control system that automatically monitors and control plant operations. No specific training, besides the operational training, has been required. NIR 7 was closed out.

The PDD presented general procedures for calculation of emissions reductions from Raudi monthly production reports, but no procedures were identified for internal audits (CAR 5) nor for identifying corrective actions in order to provide more accurate future monitoring and reporting (CAR 6).

To close out CAR 5, it was informed by the client that Raudi is implementing its Quality Management System and it is expected to be ISO 9000 certified in the next months. Documented procedures will be prepared and implemented, covering the CDM project monitoring plan and reporting. Internal and external audits will be performed, as requirement of the ISO 9000 standards.

For closing out CAR 6, it was explained by Raudi that the quantity of raw material and final product can be cross-checked with measured parameters of the system and mass balances. It is possible to perform a mass balance of each product and production route so that inconsistencies are verified and data can be corrected. In addition to this toll, the Quality management System will imply in a routine of internal verification and assessment, which includes to identify falls and to establish corrective actions.

An Observation is raised, informing that the appropriate management system, including the procedures cited in the CARs 4, 5 and 6 should be implemented before the verification stage.

Considering that the CARs and NIRs were addressed, it was concluded that the monitoring plan is in line with the AM0027.

Environmental Impacts

During the desk study, it was observed that there was not a plan for monitoring of environmental impacts or t o assess the performance of the project activity. CAR 2 was raised.

To close out CAR 2, the following indicators were included in the revised PDD (see version 2):

- Amount of CO_2 derived from fossil sources used over the period;
- Amount of steam and electricity from sugar cane bagass used over the period;
- Achieving all the necessary permits over the period;
- Number of employees in the plant for both qualification levels (operators and engineers).

Documented evidences that the project comply with environmental legislation were provided during the validation. The environmental licenses issued by the state environmental agency (IAP – Instituto Ambiental do Paraná) were checked. It was verified by the local assessor that the environmental regulation did not require an specific environmental impact assessment for the Raudi project. A documented environmental control plan was revised during the site visit and no significant environmental impacts or adverse transboundary impact were identified.

Additional information was included in the PDD (version 2), Section D.

Comments by local stakeholders

Local stakeholders have been invited by letters to comment on the "Raudi Chemical Salts" CDM project. The invitation was sent to specific stakeholders, considered representative of the general public, as defined in the Resolution n° 1 of the DNA. The following stakeholders were contacted in 10th March 2006:

- São Carlos do Ivaí City Hall
- São Carlos do Ivaí City Council
- IAP – State of Paraná Environmental Agency
- Environmental Department of São Carlos do Ivaí
- Paraná State Public Attorney
- AMUNPAR – *Associação dos Municípios do Noroeste do Paraná* - Local NGO
- FBOMS (Representative of Brazilian Environmental ONGs)

Copies of the invitation letters and receipts (AR – *Avisos de Recebimento*) were verified during the site visit.

Regarding comments received from stakeholders, one comment from FBOMS was received, suggesting the use of Gold Standard or similar tools for monitoring of sustainable indicators. The project justified the non-adoption of that standard because consider the requests made by the Brazilian Government sufficient to be used as sustainable indicators.

Other requirements

The project applied the correct PDD template and no modifications have been made to the format.

The PDD addressed all the specific requirements under each header and when the requirements were not applicable it was stated and justified.

The crediting time was defined as 7 years, starting on 01st April 2005.

Final comments and validation opinion

Steps have been taken to close out 6 CARs and 2 NIRs.
The observation raised should be considered as an improvement opportunity for the verification phase.

The Validation Opinion is based on the current and emerging rules surrounding Article 12 of the Kyoto Protocol.

The DOE declares herewith that in undertaking the validation of this proposed CDM project activity it has no financial interest related to the proposed CDM project activity and that undertaking such a validation does not constitute a conflict of interest which is incompatible with the role of a DOE under the CDM.			
By submitting this validation report, the DOE confirms that all validation requirements are met. Name of authorized officer signing for the DOE			
Date and signature for the DOE			
Section below to be filled by UNFCCC secretariat			
Date when the form is received at UNFCCC secretariat			
Date at which the registration fee has been received			
Date at which registration shall be deemed final			
Date of request for review, if applicable			
Date and number of registration		Date	Number