CLEAN DEVELOPMENT MECHANISM
SIMPLIFIED PROJECT DESIGN DOCUMENT
FOR SMALL-SCALE PROJECT ACTIVITIES (SSC-CDM-PDD)
Version 02

CONTENTS

Revision history of this document

Version Number	Date	Description and reason of revision
01	21 January 2003	Initial adoption
02	8 July 2005	• The Board agreed to revise the CDM SSC PDD to reflect guidance and clarifications provided by the Board since version 01 of this document. • As a consequence, the guidelines for completing CDM SSC PDD have been revised accordingly to version 2. The latest version can be found at <http://cdm.unfccc.int/Reference/Documents>.

SECTION A. General description of the small-scale project activity

A.1. Title of the small-scale project activity:

Aquarius Hydroelectric Project

Version 02 – 19 April 2006

Version 1 was finished and submitted to DNV for validation in April 2003.

The current version is presented in the revised form CDM SSC PDD (ver. 2), uses more recent economic data, and more recent data for the determination of the emissions factors. In the meantime, construction started on the project, in May 2005.

A.2. Description of the small-scale project activity:

The objective of the project activity is to generate clean electricity using hydroelectric resources, and provide and sell it to the regional power grid. Renewable electricity generation will avoid emissions of CO_2 that would result from fossil fuel-fired power generation.

Aquarius will generate clean electricity in a rural area of Brazil, increasing employment opportunities in the area.

The project is expected to have an installed capacity of 4.2 MW, and will utilize the water of the Correntes river. It will be a run-of-river project with no dam or flooding, and thus with very little environmental impact.

The Aquarius project was started in the 1980s, and interrupted because of uncertainties in the electric power sector. At that time, the following structures were built:

- Water intake for the channel
- Partial excavation of the conduction channel
- Three bases for blocks of anchorage of the penstock
- Access Ramp to the Power Plant area

During the 1990s the project was reactivated and linked to the 180 MW Ponte de Pedra hydropower plant which has a dam located around 10 km upstream of the proposed Aquarius project. Since mid-2005, Ponte de Pedra has been operating.

The total height difference (head) between the headpond and the turbine/generator is approximately 60 meters. The dam takes advantage of the existing natural fall and the inlet water is at 254.3 m above sea level. The project will require a 350 meter conduction channel (of trapezoidal section), and a 160 meter long penstock, and two turbines will be installed. The machinery will have the following characteristics:

Table 1. Turbines Characteristics

Turbines	
Type	simple horizontal Francis
Quantity	2
Nominal liquid head (m)	57.50
Unit nominal flow (m^3/s)	4.20
Unit nominal power (MW)	2.18
Nominal rpm	600
Nominal efficiency (%)	91.00
Maximum suction height (m)	2.50
Generators	
Type	Three-phase synchronous
Quantity	2
Unit nominal power (MW)	2.10
Nominal voltage (kV)	4.30
Nominal frequency (Hz)	60
Nominal rpm	600
Nominal efficiency (%)	96.0
Power factor (-)	0.90
Excitation type	Brushless
Transformers	
Quantity	2
Unit nominal power (MW)	2.5
Primary voltage (kV)	4.3
Secondary voltage (kV)	34.5
Power and Energy	
Gross height difference (m)	60
Liquid head (m)	57.50
Nominal flow rate (m^3/s)	8.40
Installed capacity (MW)	4.20
Capacity factor (%)	85
Guaranteed power (MW)	3.5
Annual average energy (MW_{av})	3.60
Annual firm energy (MW_{av})	3.58

- The plant will be connected to the electricity transmission network, through Sonora Substation, which is part of ENERSUL (Empresa Energética do Mato Gosso do Sul), the local electric distribution company.

- Aquarius hydroelectric plant will deliver about 25,754 MWh/year to the Brazilian power system. As the power plant is located at the end of the ENERSUL system, another important function of Aquarius will be to improve the quality of power supply in the region.

The Aquarius Project will thus contribute to sustainable development by providing a number of important benefits.

In the year 2000, the Brazilian power system had a demand of 305.6 TWh with a generation capacity of 67.7 GW; with a gross generation of 322.5 TWh. Hydroelectric plants and other renewable technologies would provide Brazil with the following benefits: (a) clean energy supply without the

negative environmental impact caused by fossil fuels, (b) reduction in the dependence on imported fossil fuels (and its corresponding dependence on foreign currency required to purchase it).

Specifically, the benefits are as follows:

Economic: On a global scale, the project provides "clean" electricity to the market, thus reducing fossil-fuel import dependence. As the Aquarius project is located at the end of the ENERSUL system, another important issue is the improvement of power supply quality in the region, through better voltage regulation, reduced system losses and fewer power supply interruptions.

Environmental: Hydroelectricity is a clean generation technology. Moreover, since Aquarius is a run-of-river hydro project, with neither dam nor flooding area, there is virtually no environmental impact caused by the project. There is however a visual impact.
In addition to CO_2 emission reductions, the project would also mitigate other pollutants, such as SO_2, NO_x and particulates associated with power generation from fossil fuels.

Social: At the Aquarius plant construction site there are no urban areas or settlements, thus no population displacement will be required. Moreover, there is no other water demand from the river at this point likely to be affected by the project. In November 2001 Aquarius was declared of social interest by Decree N° 1421/01 of the Sonora Municipality. The project will have associated benefits such as job creation and increases in the revenue of the municipality. The project has the ability to distribute some of its electricity to local inhabitants, improving their quality of life.

A.3. Project participants:

Table 2: project participants

Name of Party involved	Private or public entity	Is the Party involved a project participant?
Brazil (Host)	Aquarius Energética S.A.: Private	No
Japan	Electric Power Development Co., Ltd.: Private	No

Remark: The Project Sponsor originally was Companhia Agrícola Sonora Estância, a company whose core business is processing sugar cane to produce sugar and alcohol and besides that, electricity for self consumption. In December 20, 2004, ANEEL, the Brazilian Electricity Agency, authorized, through the document "Resolução Autorizativa 410", to transfer the project to Aquarius Energética S.A., which is a special purpose company (SPC) dedicated to generate and sell electricity, and whose almost unique Shareholder, is Companhia Agrícola Sonora Estancia.

A.4. Technical description of the small-scale project activity:

A.4.1. Location of the small-scale project activity:

A.4.1.1. Host Party(ies):

Brazil

A.4.1.2. Region/State/Province etc.:

Mato Grosso do Sul State

A.4.1.3. City/Town/Community etc:

Sonora Municipality

A.4.1.4. Detail of physical location, including information allowing the unique identification of this small-scale project activity(ies):

The project will be located in the Central-Western region of Brazil (latitude: 17°37´S and longitude 54°55¨W), in the Sonora Municipality, near the Correntes river, which separates the Mato Grosso do Sul state, from the state of Mato Grosso.

Figure 1 shows the Central-Western region of Brazil, which includes the states of Goiás, Mato Grosso, Mato Grosso do Sul and the Federal District (Brasilia). The relief of the area, located in the central plateau, is characterized by old and flat lands created by erosion.

To the West of the state of Mato Grosso do Sul and Southwest of Mato Grosso, is located the depression of the Mato-Grosso Swampland, cut by the Rio Paraguai and which is subject to floods during part of the year. The climate of the area is semi-humid tropical. The Correntes river forms part of the Paraguay river basin.

Figure 1. Political divisions of Brazil showing the Central-West region of Brazil, comprising the states of Goias (GO), Mato Grosso (MT) and Mato Grosso do Sul (MS)

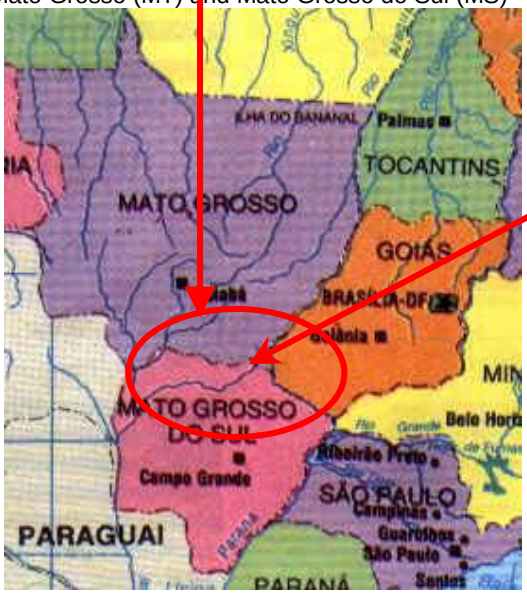

Figure 2: River basins in the Center-West of Brazil.
Source: http://www.portalbrasil.eti.br/brasil_hidrografia.htm

A.4.2. Type and category(ies) and technology of the small-scale project activity:

Type: I – Renewable Energy Projects

Category: D – Renewable Electricity Generation for a Grid

The Aquarius Hydroelectric Project conforms with the project type and category proposed, since it is a project activity which comprises renewable energy generation from the installation of a new small hydropower plant (4.2 MW) that will supply electricity to the national grid, displacing fossil fuel fired generating units.

Hydroelectricity is among the cleanest power generation technologies; it is widely used around the world and has a proven track record. The Aquarius project will import environmentally sound technologies to this rural part of Brazil. It will also train and employ local workers in the operation of these technologies.

A.4.3. Brief explanation of how the anthropogenic emissions of anthropogenic greenhouse gas (GHGs) by sources are to be reduced by the proposed small-scale project activity, including why the emission reductions would not occur in the absence of the proposed small-scale project activity, taking into account national and/or sectoral policies and circumstances:

It is expected that the project activity will serve to displace fossil fuel-fired plants with clean energy provided by hydroelectricity.

Additionality is based on economic considerations, as explained in Section B.

The baseline analysis (Section B) estimates that the Aquarius project would displace 94,798 tonnes of CO_2, during the first 7-year crediting period.

A.4.3.1 Estimated amount of emission reductions over the chosen crediting period:

Table 3: Emission reductions during the 21-year total crediting period

Years[1]	Annual estimation of emission reductions (tonnes of CO_2e)
2006-07	13,436
2007-08	13,436
2008-09	13,436
2009-10	13,436
2010-11	13,436
2011-12	13,436
2012-13	13,436
2013-14	13,436
2014-15	13,436
2015-16	13,436
2016-17	13,436
2017-18	13,436
2018-19	13,436
2019-20	13,436
2020-21	13,436
2021-22	13,436
2022-23	13,436
2023-24	13,436
2024-25	13,436
2025-26	13,436
2026-27	13,436
Total estimated reductions (tCO_2e)	**282,156**
Total number of crediting years	**3 x 7**
Annual average over the crediting period of estimated reductions (tCO_2e)	**13,436**

[1] From 1 August of one year to 31 July of the following year.

A.4.4. Public funding of the small-scale project activity:

No public funding, including official development assistance, is involved in financing this project activity.

A.4.5. Confirmation that the small-scale project activity is not a debundled component of a larger project activity:

There is a 180 MW hydropower plant (Ponte de Pedra), with a dam located 10 km upstream on the same Correntes River, which has recently started operation (mid-2005). Note, however, that Ponte de Pedra project is operated by a different company, Ponte de Pedra Energética S.A., unrelated to the Aquarius project. Thus the proposed Aquarius Hydroelectric project is not part of a larger, debundled CDM activity.

SECTION B. Application of a baseline methodology:

B.1. Title and reference of the approved baseline methodology applied to the small-scale project activity:

Type I – Renewable Energy Projects

Category I.D – Renewable Electricity Generation for a Grid

B.2 Project category applicable to the small-scale project activity:

The approved simplified methodology AMS I.D applicable to this type of project activities contains two options that can be applied to the selected project category:

"The baseline is the kWh produced by the renewable generating unit multiplied by an emission coefficient (measured in $kgCO_2/kWh$) calculated in a transparent and conservative manner as:

(a) The average of the "approximate operating margin" and the "build margin", where:

(i) The "approximate operating margin" is the weighted average emissions (in $kgCO_2/kWh$) of all generating sources serving the system, excluding hydro, geothermal, wind, low-cost biomass, nuclear and solar generation;

(ii) The "build margin" is the weighted average emissions (in $kgCO_2/kWh$) of recent capacity additions to the system, defined as the lower of most recent 20% of plants built or the 5 most recent plants;

OR,

(b) The weighted average emissions (in $kgCO_2/kWh$) of the current generation mix."

Option (a) is the one selected in this project. Historically, most generation in Brazil has been hydroelectric. However, the less expensive hydroelectric resources are exhausted, while low cost natural gas is available from Bolivia and Argentina. Gas-fired power plants require much lower capital cost, thus representing low financial risk for investment. Brazil also has thermal power plants using coal fuel oil and diesel.

Since fossil fired power plants have higher operating cost compared to hydro, these are likely to be displaced by generation from any hydro added to the system. Thus it is reasonable to choose alternative (a) for calculating baseline.

As stated above, the applied methodology corresponds to approved small-scale methodology AMS I.D, and is developed along the following steps:

1. Determination of expected annual electricity production, found by multiplying the Installed capacity (4.2 MW) by the plant capacity factor (70 %) by 8,760 (number of hours in one year) = 25,754 MWh per year.

$$\underset{\text{Output (MWh/yr)}}{\text{Annual Plant Electricity}} = \underset{\text{(MW)}}{\text{Plant Capacity}} \times \underset{\text{Factor}}{\text{Plant Capacity}} \times \underset{\text{8,760 hours/yr}}{\text{Annual Hours}} \qquad \textbf{(Eq. 1)}$$

Table 4. Expected annual electricity

Plant capacity	4.2	MW
Annual hours	8,760	h
Capacity factor	70	%
Electricity generation	25,754	MWh

2. Determine power plants serving the regional system connected to the proposed power plant. For this study, we consider power plants located in the South, South East and Center-West (S - SE – CW) region of Brazil, comprising the states of Goias, Mato Grosso, Mato Grosso do Sul, Minas Gerais and Sao Paulo. Determine annual generation of each power plant for the years 2002, 2003, and 2004. Relevant data on power plant generation were obtained from the following sources:
   - Operador Nacional do Sistema Elétrico, Centro Nacional de Operação do Sistema, Acompanhamento Diário da Operação do SIN, (daily reports from Jan. 1, 2002 to Dec. 31, 2004).
   - Agência Nacional de Energia Elétrica. Banco de Informações da Geração (http://www.aneel.gov.br/)
   - Agência Nacional de Energia Elétrica. Superintendência de Fiscalização dos Serviços de Geração. Resumo Geral dos Novos Empreendimentos de Geração (http://www.aneel.gov.br/).

3. Determine efficiencies of power plants based on fossil fuels that were identified in the previous step. Data sources: See Table 6 below.

4. Determine “operating margin” emission factor (tonne CO_2 per MWh electricity) for thermal power plants identified above (excluding hydro, geothermal, wind, nuclear, low-cost biomass, and solar generation). Use data for 2002, 2003, and 2004.

5. Determine “build margin” emissions factor (tonne CO_2 per MWh electricity) for the power plants representing at least 20% of total generation.

6. Determine "combined margin" emissions factor (tonne CO_2 per MWh electricity) as arithmetic mean of "operating margin" and "build margin" emissions factors.

7. Determine annual emissions of carbon dioxide by multiplying electricity generation by the corresponding emission factor.

Table 6: Key data

Parameters	Data sources
Electricity generation of the power plants serving the national system	Operador Nacional do Sistema Elétrico. Centro Nacional de Operação do Sistema. Acompanhamento Diário da Operação do SIN (daily reports from Jan. 1, 2002 to Dec. 31, 2004)
Capacity additions to the system	Agência Nacional de Energia Elétrica. Banco de Informações da Geração
Emission factors of fuels	IPCC Guidelines for National GHG Inventories
Fossil fuel conversion efficiencies	Bosi, M., A. Laurence, P. Maldonado, R. Schaeffer, A. F. Simoes, H. Winkler and J.-M. Lukamba. "Road testing baselines for greenhouse gas mitigation projects in the electric power sector." OECD and IEA information paper, October 2002. Where plant-specific efficiency data were not available the following values were used: (i) Combined cycle gas turbine power plants - 50%, (ii) Open cycle gas turbine power plants - 32%, (iii) Sub-critical coal power plants - 33%, and (iv) Oil based power plant sub-critical oil boiler - 33%. Source: CDM-EB-2005.11.29-DOEs request for guidance on average plant efficiencies. Decision of the CDM EB responding to DNV "Request for guidance: Application of AM0015 (and AMS-I.D) in Brazil, dated 7 October 2005.
Variables	**Data sources**
Annual electricity production of Aquarius plant	Measured by Aquarius Energética S.A.

B.3. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the registered small-scale CDM project activity:

Attachment A to Appendix B of the simplified modalities and procedures for small-scale CDM project activities (30 September 2005 edition) states:

> "*Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:*
>
> *(a) Investment barrier: a financially more viable alternative to the project activity would have led to higher emissions;*
>
> *(b) Technological barrier: a less technologically advanced alternative to the project activity involves lower risks due to the performance uncertainty or low market share of the new technology adopted for the project activity and so would have led to higher emissions;*
>
> *(c) Barrier due to prevailing practice: prevailing practice or existing regulatory or policy requirements would have led to implementation of a technology with higher emissions;*
>
> *(d) Other barriers: without the project activity, for another specific reason identified by the project participant, such as institutional barriers or limited information, managerial resources, organizational capacity, financial resources, or capacity to absorb new technologies, emissions would have been higher."*

Hydroelectric projects in Brazil do not face any technological barrier or barrier due to prevailing practice, since hydroelectric generation is well established.

We can analyse whether the project faces an investment barrier, by conducting a cash-flow analysis of the project.

A cash-flow analysis conducted in mid 2003, when this project was first submitted gave the following values. The internal rate of return (IRR) of the project without CER credits is 19.8%, while with credits, the value increases to 21.0%.

Project revenues depend on the sale of electricity, and Brazil has an incentive program (called PROINFA) to promote electricity from small-scale renewable sources. PROINFA would basically purchase renewable electricity at a favourable rate for the seller. However, PROINFA did not establish electricity purchase prices until April 2004. Meanwhile, project validation was put on hold pending a better definition of project economics and the validity of the investment barrier.

For the first phase purchase of electricity generated by small-hydro projects, the Ministry of Mines and Energy set a price of: R$117.02 per MWh. On June 30 2004, a PPA agreement was signed with Eletrobrás, with the price already updated to R$ 121.35 per MWh.

In the year-long period since the original PDD was prepared and until PROINFA power prices were set, exchange rates of Brazilian Real to the US Dollar had also changed. The revised (2004) values of internal rate of return of the project without CER credits became 21.3%, while with credits, the value increases to 22.6%. This cash flow analysis is presented in a *Reserved Appendix*, made available to the Project Validation team and to project participants, but not to the public.

Note that the economic analysis to determine project additionality was conducted in 2003 and 2004, prior to the decision to go ahead with the project. Thus, the economic analysis presented here is based on data applicable to 2003 and 2004.

As with other projects involving renewable electricity generation, the difference in project IRR with and without CER credits are relatively small. This difference depends on the emission factor for renewable electricity generation and on the CER price, neither of which changed significantly over the period 2003-04.

In asking the question: "What is a reasonable rate of return for small power projects in Brazil?", we have to consider two aspects: the risks inherent in the Brazilian economy, and the risks of power sector investments in Brazil.

Brazilian economy.
Brazilian Real benchmark interest rate (SELIC) was 26.3% from February to April 2003 when the PDD was originally formulated. The SELIC value varied between 15.79% and 17.74% during 2004 when the PDD was revised. If there were no additional risks, the minimum hurdle rate for investment in Brazil would thus be 16 to 18%.

Brazilian power sector.
Brazil suffered a serious power shortage in 2000 and 2001, because of decrease in water reservoir levels. As a result several emergency measures were taken to increase generation capacity, especially thermal power generation. The first of these was a 2000 decree developing a Priority Thermal Power Plan. There were also strong measures to promote electricity conservation, including efficiency programs. As a result demand did not grow in 2002, while supply increased and in 2003, there were power surpluses, forcing spot electricity prices down to extremely low values.

> "*A combination of heavy rains, boosting hydroelectric output, and low demand, a residual effect of conservation efforts from power-shortage days, has conspired to slash rates...and profits*", wrote Tom Murphy in Agencia Estado (March 27, 2003).

Many electric companies were posting losses in 2003.

This situation no doubted prompted the authorities to delay the implementation of PROINFA.

Aquarius is a hydroelectric project with a long expected life, so that there is additional risk implicit in making such a long-term investment.

Moreover, Brazilian electricity prices are set in Reais, and while they are revised periodically, they cannot be construed as an investment made in US dollars with returns in the same currency.

Finally, the cost of capital for small companies and investments is substantially higher than for larger projects, such as large power plants.

Thus, considering the overall investment risks in the Brazilian economy, compounded by additional risks in the power sector, and uncertainties in the sale price of renewable electricity, it is highly unlikely that the computed project IRR 21.3% (without CERs) or indeed the IRR of 22.6% with CERs provides sufficient incentive to justify investment.

In the final analysis, given uncertainties, investment decisions are not based strictly on estimates of IRRs. In this case, the project sponsor and investor (Aquarius Energética S.A.) is a special purpose company (SPC) dedicated to generate and sell electricity. The main Shareholder, Companhia Agrícola Sonora Estância, is a company whose core business is processing sugar cane to produce sugar and alcohol and besides that, produces electricity for self consumption. The site chosen for the small hydro plant is located close to their sugar cane operations. The project was contemplated many years ago, in name of the Companhia Agricola Sonora Estância, which later on was authorized by ANEEL to transfer the project to the new SPC, which started its implementation in may 2005. The municipality of Sonora supports the project as being of social benefits to the community, creating jobs, improving power quality, etc. For the sponsor this project is an opportunity to contribute to the process, while diversifying its operations, learning by doing a small hydro project. All of these factors influence the company's decision to go ahead with the project. Within this context, being able to contribute to mitigate climate change is another social benefit that motivates the project sponsor. The small margin in IRR is only one of many motivating factors in their decision to implement the project.

B.4. Description of how the definition of the project boundary related to the baseline methodology selected is applied to the small-scale project activity:

The project boundary encompasses the physical, geographical site of the hydropower generation source, which is represented by the Correntes river basin close to the power plant facility. Schematically, Figure 5 shows the project boundary in which all sources of GHG emissions (Table 7) are included.

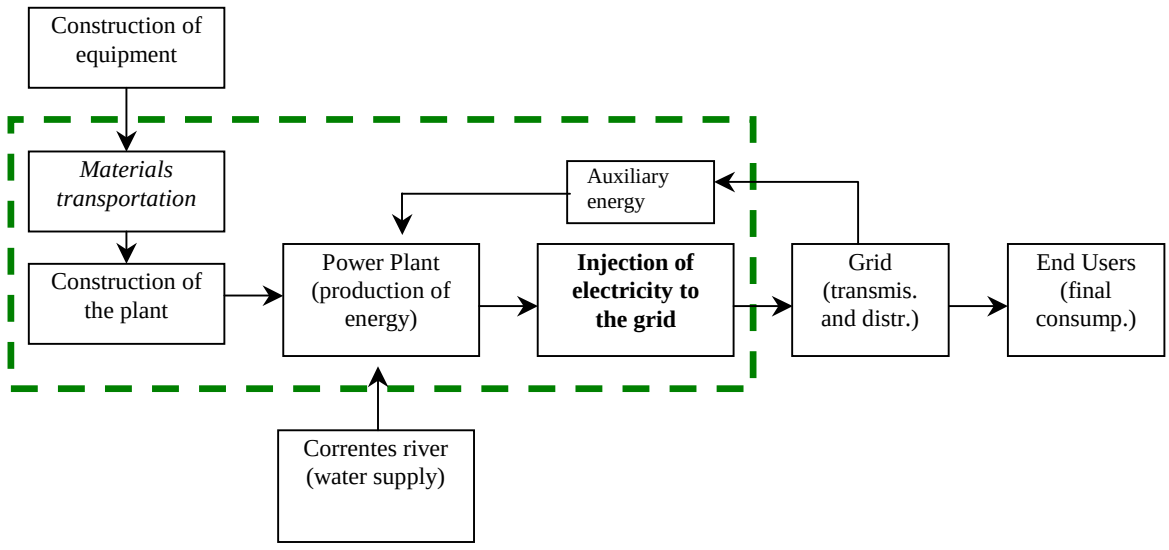

Figure 5. Flow chart of the Aquarius Project. Dashed line indicates project boundary.

Table 7. Sources of emissions and project boundaries

Sources	On-Site	Off-Site
Direct	• CO_2 emissions during the project construction (e.g. fuel use by trucks and machinery). • Negligible emissions are expected during the project's operation.	• *One-step upstream:* Emissions related to the transport of construction materials and equipment to the project site. • *One-step downstream*: Emissions related to grid losses due to transmissions and distribution of energy generated by the project.
Indirect (leakage)	• None are expected.	• Emissions during the manufacturing process of parts, supplies and machinery required for building the project (i.e. cement, electromechanical equipment, etc.). These are outside the control of the project and excluded. • Avoided emissions at the interconnected national grid by providing renewable power rather than having to use existing or build additional thermal power plants is accounted as a source of project emission reductions.

Direct on-site emissions
The direct on-site emission sources can be divided into activities prior to and during the operation of the project. Since hydropower is a clean energy source there will be no GHG emissions that are directly related to hydropower generation. The exception is the construction phase needed to get the project up and running.

During construction there will be direct on-site emission, mostly through the burning of fossil fuels by trucks and construction machinery. The following activities have been identified as sources of direct on-site emissions: the tunnel, the oscillation tank, the penstock and the powerhouse. While these emissions are within the project boundaries they will not be accounted as are likely to be less than a few percent of the total project emissions.

The use of energy for the operation of the power plant such as energy for cooling systems, lighting, ventilation, compressors, etc. will be supplied by the plant itself when operating.

Direct off-site emissions
Direct off-site emissions are those directly influenced by the project activity but that will occur outside the project area. This includes, in principle, one step upstream and downstream emissions. Although hydropower facilities do not produce emissions during the generation of electricity, there would be emissions related to grid losses due to the transmission and distribution of the energy generated by the project (one-step downstream).

In addition, the transport of construction materials and equipment to the project site would also be accounted. However, these are beyond the project control and will not be accounted following small-scale CDM project activities simplified M&P. All power plants connected to the grid will suffer from transmission and distribution losses.

Indeed transmission and distribution losses are likely to be smaller from small power plants, since they are likely to be closer to demand centers.

Indirect on-site emissions
The indirect on-site emissions identified are related to plant consumption when it is not operating, and must consume electricity from the grid. Since hydropower is highly reliable, the plant is expected to be operating virtually all the time, with power output determined by water availability. Thus, indirect on-site emissions are very small and will be neglected.

Indirect off-site emissions
These emissions are related to activities that will occur outside the project boundaries and are not directly influenced by the project activity. While the electricity produced by the project will be fed into the grid and undoubtedly the presence of the project will change the patterns of energy dispatching at the interconnected grid, shifts in production is considered a source of emissions reductions indirectly attributed to the project activities.

In addition, emissions during the manufacturing process of parts, supplies and machinery required for building the project (i.e. cement, electromechanical equipment, etc.). These are beyond the control of the project and will not depend on the project activity level. Therefore, they will not be accounted for.

B.5. Details of the baseline and its development:

The baseline scenario involves the electricity that would have otherwise been generated by the operation of the existing and new fossil fuel-fired power plants connected to the grid. The baseline is determined using the approved small-scale methodology AMS I.D: *Grid connected renewable electricity generation*. This methodology is applicable since the power output of the proposed project activity is 4.2 MW, far below the limit of 15 MW for which this methodology is applicable.

As commented in Section B.2, the CDM Executive Board has agreed in its seventh meeting to deal with two possibilities regarding baseline determination in Type I, Category D of small-scale project activities (Appendix B of the Simplified Modalities and Procedures for Small-Scale CDM Project Activities, Indicative Simplified Baseline and Monitoring Methodologies for Selected Small-Scale CDM Project Activity Categories, Unedited Version: 24-01-03; 2:30 PM, Report of the 7th Meeting of the Executive Board).

Date of completing the final draft of this baseline section: 28/02/2003 (Original version)
19/04/2006 (Updated version)

Name of person/entity determining the baseline:

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SECTION C. Duration of the project activity / Crediting period:

C.1. Duration of the small-scale project activity:

C.1.1. Starting date of the small-scale project activity:

Construction began in May 2005. Duration of the construction: 14 months. Commercial Generation expected to start end of July 2006.

Table 8. Construction Timeline

Activities	Month
Infra-Structure and Project	6
Civil constructions finished	11
Transmission Lines operating	12
Turbines and Generators installed	13
Sub-Station ready	13
Generation of Unit 1	13
Generation of Unit 2	14
End of the construction	14

C.1.2. Expected operational lifetime of the small-scale project activity:

30 years

C.2. Choice of crediting period and related information:

Renewable crediting period

C.2.1. Renewable crediting period:

7 years

C.2.1.1. Starting date of the first crediting period:

01/08/2006

C.2.1.2. Length of the first crediting period:

7 years

C.2.2. Fixed crediting period:

N/A

C.2.2.1. Starting date:

N/A

C.2.2.2. Length:

N/A

SECTION D. Application of a monitoring methodology and plan:

D.1. Name and reference of approved monitoring methodology applied to the small-scale project activity:

According to option (a) of Type I, Category D of CDM small-scale project activity categories contained in Appendix B of the simplified M&P for CDM small-scale project activities, monitoring shall consist of metering the electricity generated by the renewable technology (hydroelectricity).

There are no approved methodologies yet to give the monitoring methodology for this project activity a specific name.

D.2. Justification of the choice of the methodology and why it is applicable to the small-scale project activity:

Monitoring has been chosen as it is suggested in the last proposal on “Indicative simplified baseline and monitoring methodologies for selected small-scale CDM project activity categories”.

Data collection is compatible with the baseline methodology described in Section B.2.

D.3 Data to be monitored:

ID number	Data type	Data variable	Data unit	Measured (m), calculated (c) or estimated (e)	Recording frequency	Proportion of data to be monitored	How will the data be archived? (electronic/ paper)	For how long is archived data to be kept?	Comment
1	Electricity supplied to the grid by Aquarius hydropower plant	CG	MWh	m	Every 15 minutes	*All*	electronic	*10 years*	Data source: Aquarius Energética S.A**.**

D.4. Qualitative explanation of how quality control (QC) and quality assurance (QA) procedures are undertaken:

Data (Indicate table and ID number e.g. 3.-1.; 3.2.)	Uncertainty level of data (High/Medium/Low)	Explain QA/QC procedures planned for these data, or why such procedures are not necessary.
1	Low	Standards procedures taken from readings of electricity meters., as explained in section D.5. of this PDD.

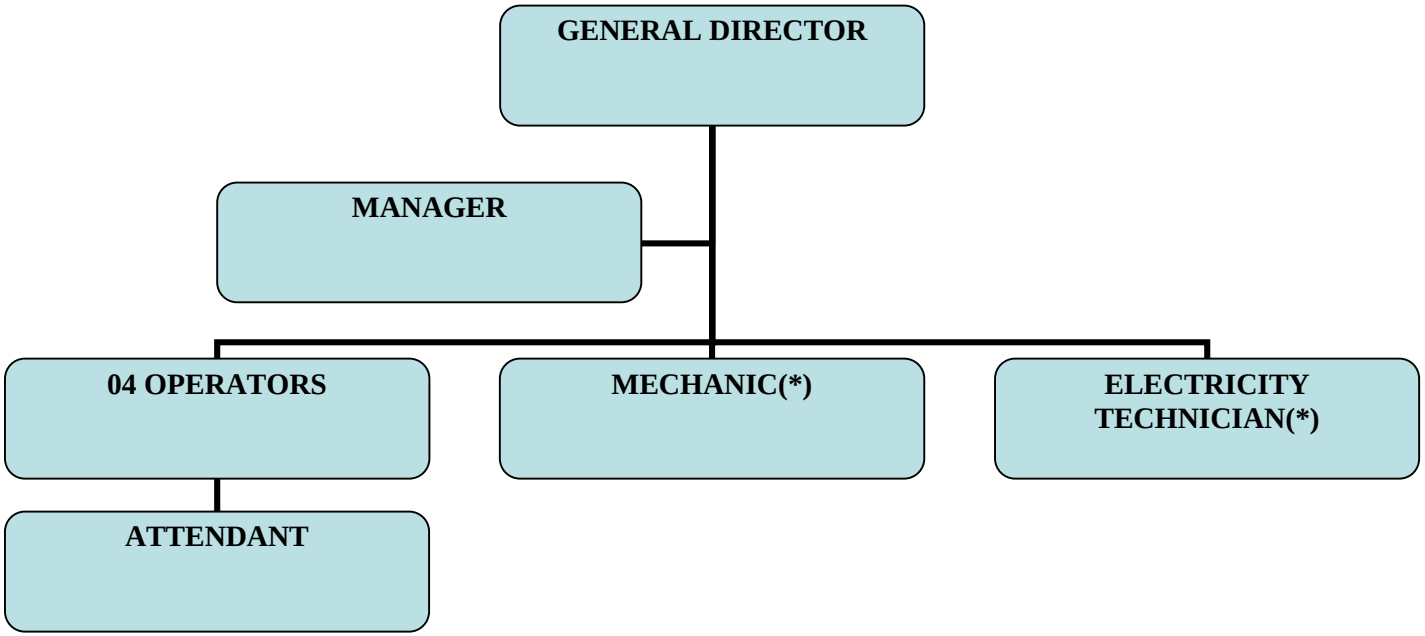
D.5. Please describe briefly the operational and management structure that the project participant(s) will implement in order to monitor emission reductions and any leakage effects generated by the project activity:

The Aquarius small hydropower plant will have a supervision system that will be controlled by a Bosch PLC (programmable logic control - model CL200) and will use a supervision software ("Indusoft Web Studio Control Room"). The electrical parameters, which will be measured and sent to the central supervision equipment, will be monitored by a multi-measuring equipment type MGE 144, manufactured by ABB. The mentioned central supervision equipment will have the ability to generate reports, tables, graphs, historical data and trend graphs, including supplied and consumed energy.

The generated energy will be transmitted to a substation belonging to the power utility ENERSUL, where, according to the Power Purchase Agreement (PPA) signed between Aquarius and Eletrobrás, monitoring equipment will be installed by the seller. This equipment will be online to the CCEE (Electrical Energy Commercialization Chamber), who will be responsible for the accounting of the supplied energy. The monitoring of these measurements will be done under the responsibility of ENERSUL. This equipment will also have an additional output that will be available for the seller in order to perform his own monitoring. It will record the supplied energy in MWh through measurements made every fifteen minutes. The measurements will be archived electronically. The maintenance of these installations is foreseen to be done by ENERSUL, as subcontracted by Aquarius.

No leakage effects are expected for this type of project activity.

The chart below shows the formal organizational structure of Aquarius Energética S.A.



(*): Sub -Contracted

D.6. Name of person/entity determining the monitoring methodology:

Dr. Gautam S. Dutt, Ing. Ivana Cepon, and Ing. Ignacio Barutta

MGM International SRL

Junín 1655, 1º B

C1113AAQ, Buenos Aires, Argentina

Tel./Fax: (54 11) 5219-1230/32

e-mail: gdutt@mgminter.com; icepon@mgminter.com

Dr. Dutt, Ing. Cepon, and Ing. Barutta are not project participants.

SECTION E.: Estimation of GHG emissions by sources:

E.1. Formulae used:

E.1.1 Selected formulae as provided in appendix B:

N/A

E.1.2 Description of formulae when not provided in appendix B:

E.1.2.1 Describe the formulae used to estimate anthropogenic emissions by sources of GHGs due to the project activity within the project boundary:

Emissions by sources are zero since hydroelectric power is considered to be renewable.

E.1.2.2 Describe the formulae used to estimate leakage due to the project activity, where required, for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities

N/A

E.1.2.3 The sum of E.1.2.1 and E.1.2.2 represents the small-scale project activity emissions:

No emissions at all.

E.1.2.4 Describe the formulae used to estimate the anthropogenic emissions by sources of GHGs in the baseline using the baseline methodology for the applicable project category in appendix B of the simplified modalities and procedures for small-scale CDM project activities:

Total emissions, E, are given by:

$$E(tonne\,CO_2 / year) = \sum_j E_j (tonne\,CO_2 / year) \quad \textbf{(Eq. 2)}$$

where E_j = CO_2 emissions per year of the generation mode j, calculated as:

$$Ej(tonne\,CO_2 / year) = \frac{FC_j \cdot CV_j \cdot EF_j \cdot CF}{10^9} \quad \textbf{(Eq. 3)}$$

where FC_j = annual fuel consumption of power plant *j*; (1000 m^3 of natural gas or million litres of diesel)
CV_j = calorific value of source *j* (kcal/m^3 or kcal/l)
EF_j = emission factor of the fuel used in power plant *j* (tonne CO_2/PJ)
CF = unit conversion factor: 4.816 J/cal;
10^9 = unit conversion factor

Weighted average emission intensity ⟨E⟩, is given by:

$$\langle E \rangle (kgCO_2 / kWh) = \frac{E(tonne\,CO_2 / year)}{PG(MWh / yr)} \quad \textbf{(Eq. 4)}$$

where $E(tonne\,CO_2 / year)$ is given by Equation (2);
$PG(MWh / yr) = \sum_j PG_j (MWh / yr)$

Equation (4) is applicable to both the **operating margin** and the **build margin** cases. The only difference lies on the set of power plants considered in each case.

The **emission intensity coefficient, $\langle E \rangle_{baseline}$,** is thus obtained as:

$$\langle E \rangle_{baseline} (kgCO_2 / kWh) = \frac{\left\{ \langle E \rangle_{operating\ margin} (kgCO_2 / kWh) + \langle E \rangle_{build\ margin} (kgCO_2 / kWh) \right\}}{2} \quad \textbf{(Eq. 5)}$$

Finally, **baseline emissions, $E_{baseline}$** are given by:

$$E_{baseline} (tonne\,CO_2 / year) = \frac{\langle E \rangle_{baseline} (kgCO_2 / kWh) \cdot CG(kWh / yr)}{1000\,kg / tonne} \quad \textbf{(Eq. 6)}$$

where CG stands for electricity generation at the Aquarius power plant.

E.1.2.5 Difference between E.1.2.4 and E.1.2.3 represents the emission reductions due to the project activity during a given period:

According to the baseline methodology emission reductions are those derived from Equation (6), since project emissions are zero.

E.2 Table providing values obtained when applying formulae above:

Considering the Aquarius's installed capacity (4.2 MW) and its expected capacity factor (*CF* = 70%), the expected annual electricity generation by the Aquarius project is 25,754 MWh/yr.

The Aquarius hydroelectric project supplies electricity to the S – SE – WC interconnected system. Baseline emissions reported in this PDD are estimated ex-ante values. Creditable emissions reductions will be calculated ex-post for the emission factor corresponding to the mentioned interconnected system.

Build margin estimation:

$\langle E \rangle_{\text{build margin}}$ = **0.0962** tonne CO_2/MWh

The build margin was obtained considering the most recent power plants (up to November 2004) that add up to (just over) 20% of total generation. These include all power plants built since Jan. 1992, which is the Segredo hydro plant.

Operating margin estimation:

$\langle E \rangle_{\text{operating margin}}$ **= 0.9472** tonne CO_2/MWh, based on average for years 2002, 2003, and 2004.

The details of these calculations may be found in the spreadsheet "ONS-Emission factors SSECO 2002-2004-2006.03.13.xls" that is submitted with this PDD to the validation team.

Note that these values are very similar to those calculated and presented in the PDD of the registered "*Koblitz - Piratini Energia S. A - Biomass Power Plant – Small Scale CDM Project*". The build margin and operating margin in that PDD are 0.1045 and 0.9472 tonne CO_2/MWh, respectively. The slight discrepancy in the build margin values between the two calculations is based on the exact power plants included to make up 20% of total generation. The power plants included in the build margin calculation for Koblitz excluded the Segredo hydro power plant, and added up to just under 20% of total generation, whereas the methodology requires that the power plants add up to *no less than* 20% total generation.

Baseline estimation:

Baseline emission factor is given by:

$\langle E \rangle_{\text{baseline}} = (\langle E \rangle_{\text{build margin}} + \langle E \rangle_{\text{operating margin}})/2 = 0.5217$ tonne CO_2/MWh.

Total emission reductions are the same as baseline emissions:

Table 11. Baseline Emissions Data

	Value	Unit
$\langle E \rangle_{build\ margin}$	0.0962	tonne CO_2/MWh
$\langle E \rangle_{operating\ margin}$	0.9472	tonne CO_2/MWh
$\langle E \rangle_{baseline}$	0.5217	tonne CO_2/MWh
Annual electricity generation by the Aquarius project	25,754	MWh
$E_{baseline}$	**13,436**	**tonnes CO_2/year**

Table 12: *Ex-ante* emission reductions during the first 7-year crediting period (tCO_2e)

Year[2]	Baseline emissions	Project emissions	Leakage	Emission reductions
2006-07	13,436	0	0	13,436
2007-08	13,436	0	0	13,436
2008-09	13,436	0	0	13,436
2009-10	13,436	0	0	13,436
2010-11	13,436	0	0	13,436
2011-12	13,436	0	0	13,436
2012-13	13,436	0	0	13,436
Total	**94,052**	**0**	**0**	**94,052**

In subsequent crediting periods, the electricity generation is expected to be the same, but emissions reductions would be different, depending on updated calculations of build and operating margin.

SECTION F.: Environmental impacts:

F.1. If required by the host Party, documentation on the analysis of the environmental impacts of the project activity:

The proposed project is a run-of-river hydropower plant, which involves no dam construction and no flooding, and thus no deforestation. Therefore, the environmental impact is very small compared to other types of power generations alternatives.

This conclusion is supported by a number of studies for which the following documents are available: Plant Design Blueprints, Environmental Impact Study, Water Quality Study, Geological Study, Topographical Study.

This project has already got the prior licensing. See annexed the prior licensing n º 123/2002 issued on April 25, 2002.

The Basic Environment Plan was presented in Sept. 2002 and as a consequence, the Installation license was issued under n º 214/2002 on Dec. 20, 2002.

[2] Defined from 1 August of one year to 31 July of the following year.

SECTION G. Stakeholders' comments:

G.1. Brief description of how comments by local stakeholders have been invited and compiled:

In June 2003, a local Stakeholders consultation process was conducted. Representatives of nine entities were invited at that time and received a short description on the Greenhouse Effect, about the CDM in the world and in Brazil and about the Brazilian DNA; they also received a description of the project and a questionnaire sent to them with some questions related to the project. The entities that were invited were the following:

- Rotary Club of Sonora;
- Foundation for Education and Health of Sonora;
- A Local State School;
- Alderman Chamber of Sonora;
- Municipal Union of employees in Education;
- Rural Workers Union;
- Municipal Environmental Secretary;
- A local Church;
- A local organization for supporting handicapped people

However, due to some internal problems, the project start was delayed and on September 11, 2003, the Brazilian DNA issued the Resolution number 1, which was revised and complemented on October 18, 2005, establishing new and more strict rules to approve projects, including a definition on which entities shall be consulted and some rules on how to conduct the local stakeholders consultation process. Therefore the Project Sponsor decided to conduct again a local stakeholders consultation process, according to the new rules.

The Resolution number 1 established that the consultation must be performed by the project sponsor at least with the following entities:

- Municipality and Alderman Chamber
- State and Municipal Environmental Agencies
- Brazilian Forum of NGOs
- Community Associations
- Public Ministry

The invitation letters were sent to the stakeholders listed below during November and December 2005. (Copies of the letters are available on request.)

The following documents were made available at a website available to all potential stakeholders: http:/www.mgminter.com.ar/Projeto_Hidrelétrica_Aquarius. This webpage was initiated on 7 Dec. 2005 and was open for four months, as indicated in the letter inviting stakeholder comments.

- Project Design Document
- Presentation on the Aquarius project
- Executive Summary of Aquarius project
- General Concepts on Greenhouse Effect and the Kyoto Protocol
- Approval letter from Sonora Municipality

Version 1 of the PDD was also published for comments at UNFCCC's CDM website (cdm.unfccc.int) during the initial validation, so that anyone interested would have access to the document from a legitimate source.

The stakeholders who were invited to participate in this process are the following:

- Municipality (Prefeitura)
- Alderman Chamber (Câmara dos Vereadores)
- State Environmental Agencies:
  - IMAP/MS – Instituto de Meio Ambiente Pantanal, vinculado à SEMA/MS
  - Secretaria de Estado de Meio Ambiente e Recursos Hídricos de Mato Grosso do Sul
- Municipal Environmental Agency
- Public Ministry of Mato Grosso do Sul
- Brazilian Forum of NGOs – Forum Brasileiro de ONGs e Movimentos Sociais para o Meio Ambiente e Desenvolvimento
- Some NGOs/Associations acting on national or regional/local level and involved with social and environmental issues
- Local state schools and/or universities

The municipality (called Prefeitura) of Sonora, where the project would be located, is a major stakeholder in the project. They were already asked once to give an opinion on the project, when the project was still in the hands of Companhia Agricola Sonora Estancia. Their comments were in the form of a letter of support, attached to this document, as Annex 3.

Another stakeholder already consulted at that time, is the Brazilian Institute of Environment and Renewable Natural Resources (IBAMA). IBAMA issued an environmental license, which is attached as Annex 4.

G.2. Summary of the comments received:

The letter of support from the *Prefeitura de Sonora* (Municipality of Sonora) in Mato Grosso do Sul state, is attached as Annex 3. In this letter, the Municipality declares the Aquarius small hydro project of Social Interest, since it will increase revenues to the municipality, create employment and provide training to local manpower.

The Brazilian Institute of Environment and Renewable Natural Resources (Instituto Brasileiro dos Meio Ambiente e Recursos Naturais Renovais, IBAMA) issued an Environmental License on April 22, 2002,

to the Aquarius small hydroelectric project proposed by *Companhia Agrícola Sonora Estancia*. A copy of the license is included as Annex 4.

After the PDD has been posted on the DNV website, we expect to receive additional comments from stakeholders.

The answers to the 2003 stakeholder consultation process, in general, were favourable to the implementation of the project and no negative remarks were made. The answers (in Portuguese) are available to the DOE in charge of project Validation.

Regarding the most recent (2005-06) stakeholder consultation process, the entities and persons invited to comment on the project were:

- Municipality of Sonora: Mr. Zelir Antonio Maggioni (Mayor)
- Alderman Chamber: Mr. Francisco Deusimar Lima (President)
- State Environmental Agency: Mr. Mr. Cid Roner
- Municipal Environmental Agency: Mr. Patrocinio Sales Arruda
- Brazilian Forum of NGOs : Mrs. Esther Neuhaus
- Public Ministry: Mr. Adriano Viana Lobo Resende
- Mrs. Maria Elida Francisco (Alderman)
- Nossa Senhora Aparecida (Church): Padre Tiago José Lino Peixoto
- Medical Assistance for work and business Mr. José Afonso de André (Director)
- State school CMT Mauricio Dutra: Mrs. Adrielly Alves Rodrigues (teacher)
- Apae of Sonora: Mr. Audo Machado se Camargo
- Pastoral da Criança: Mrs. Lauredina R.S. Marcionilio
- Cedesco School: Mrs. Carmen Barbosa da Rocha Camargo (Director)
- Radial Consulting: Mr. Luis Antonio Cardoso
- Mato Grosso do Sul State University: Mrs.Pricila Gusmão Pompiani (teacher)

The entities and persons who commented on the project were:

- Municipality of Sonora: Mr. Zelir Antonio Maggioni
- Alderman Chamber: Mr. Francisco Deusimar Lima
- Municipal Environmental Agency: Mr. Patrocinio Sales Arruda
- Mrs. Maria Elida Francisco (Alderman)
- Nossa Senhora Aparecida (Church): Padre Tiago José Lino Peixoto
- Medical Assistance for work and business Mr. José Afonso de André (director)
- State school CMT Mauricio Dutra: Mrs. Adrielly alves Rodrigues (teacher)
- Apae of Sonora: Mr. Audo Machado se Camargo
- Pastoral da Criança: Mrs. Lauredina R.S. Marcionilio
- Cedesco School: Mrs. Carmen Barbosa da Rocha Camargo (director)
- Radial Advising: Mr. Luis Antonio Cardoso
- Mato Grosso do Sul State University: Mrs.Pricila Gusmão Pompiani (teacher)

The invitation letters were sent and the copies of the letters and the acknowledgement of receipt (called AR in Brazil) are available to validation process, if needed.

With the purpose to facilitate the comments of the invited persons, a questionnaire was sent to them with 06 questions, as a suggestion. We list below the questions and a summary of the comments received.

1. *Do you believe that the socio-economic situation of the Region will improve due to the implementation of the Projeto Hidreletrica Aquarius?*

One invited person said that the social and financial improvement only will be satisfied if the electric energy and the employment could be utilized by municipality people.

All the presented comments were positive, emphasizing the project will be one more source of employment and resources for the municipality, besides supplying electric energy for the region.

2. *Is the implementation of project able to improve the environmental situation in the Region?*

One invited person believes that there will be environmental impacts, despite the financial regional improvement.

Most comments regarding this question were positive, including some concern over issues such as:

- Would all relevant legislation be strictly met?
- Are all negative impact of project adequately mitigated?
- Would the project provide additional benefits, for example, reforestation?

3. *How does the development of the project affect you (positively or negatively) or your environment?*

The considerations regarding this question were positive, specifically noting employment increase and regional development. One invited person reiterated the labour laws must be respected.

4. *Would you recommend private companies or authorities to develop projects of this nature?*

The comments received were positive. Some comments contain conditions or recommendations: One invited person conditioned his recommendation for new projects, if all economic and environmental information be spread to persons within the municipality, mainly for poor people.

Other invited person conditioned his recommendation for others similar projects in case the purpose of the project is to increase the development of the region and not only financial purpose.

Another recommendation is with concern to take care of environmental conservation.

5. *Do you think the Project will contribute to the Brazilian Sustainable Development ?*

All answers were positive, considering the regional development and the taxes generation, and the project will diminish the fossil fuel consumption.

6. *Any additional comments you would like to make.*

Some expressed the opinion that the project was serious and innovative, and would contribute to the development of the region and the country.

Two invited persons recommended to project sponsor, the publishing of more technical and environmental details about the project.

There were also some congratulations for the initiative of the project.

G.3. Report on how due account was taken of any comments received:

Since all stakeholders consulted so far, including the two important ones mentioned above, support the project, no modifications to project design were necessary.

However, despite the acceptance of the project, we emphasize that the environmental aspects will be carefully observed with the objective to manage any eventual environmental impact.

No additional observations were received following the posting of the PDD on the website of the project validator, Det Norske Veritas, thus requiring no changes either.

Annex 1

CONTACT INFORMATION ON PARTICIPANTS IN THE PROJECT ACTIVITY

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Represented by:	
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Salutation:	
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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

No funds from public national or international sources were used in any aspect of the proposed project. The project would be funded by equity from the project sponsor and a loan from a commercial bank.

Annex 3

LETTER OF SUPPORT FROM THE MUNICIPALITY OF SONORA

Attached is a letter from the *Prefeitura de Sonora* (Municipality of Sonora) in Mato Grosso do Sul state. In this letter, the Municipality declares the Aquarius small hydro project of Social Interest, since it will increase revenues to the municipality, create employment and provide training to local manpower.

Prefeitura de Sonora
O cidadão em 1º lugar!

Estado de Mato Grosso do Sul

DECRETO Nº 1247/01 **DE 07 DE NOVEMBRO DE 2.001.**

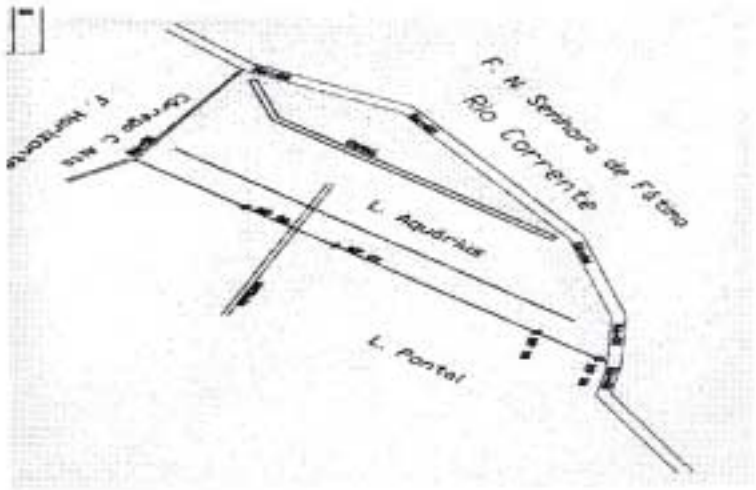
O PREFEITO MUNICIPAL DE SONORA, ESTADO DE MATO GROSSO DO SUL, no uso de suas atribuições legais,

DECRETA:

Art. 1º - Fica declarada de interesse social a área de implantação da **PCH Aquarius**, uma vez que este empreendimento irá incrementar a receita municipal de Sonora, além de geração de empregos e formação de mão-de-obra local.

Parágrafo Único - A área de implantação, disposta neste Artigo possui as seguintes coordenadas e delimitação:

COORDENADAS	
NP-06	X= 724052.1761 Y=8050370.7149
NP-07	X= 724158.4712 Y=8058419.3598
NP-08	X= 724371.7398 Y=8058769.9584
NP-09	X= 724440.1697 Y=8059053.4527
NA-01	X= 723926.8714 Y=8058237.9137
NA-02	X= 723707.4755 Y=8058368.7986
NA-03	X= 723818.7599 Y=8058588.2938
NA-04	X= 724139.7667 Y=8058855.8497
NA-05	X= 724334.9838 Y=8058873.7986
NA-06	X= 724449.5155 Y=8058867.1415



Art. 2º - Este Decreto entra em vigor na data de sua publicação.

Art. 3º - Revogadas as disposições em contrário.

Luis Carlos Simões
Prefeito Municipal

Rua do Cedro, 262 – Centro – 79.415-000 – Sonora-MS
Telefones: (0XX67) 254-1135/1127/1522/1550

Annex 4

LICENSE FROM THE BRAZILIAN INSTITUTE OF ENVIRONMENT AND RENEWABLE NATURAL RESOURCES (IBAMA)

Attached is a copy of the Environmental License issued on April 22, 2002, by the Brazilian Institute of Environment and Renewable Natural Resources (Instituto Brasileiro dos Meio Ambiente e Recursos Naturais Renovais, IBAMA) to the Aquarius small hydroelectric project proposed by *Companhia Agrícola Sonora Estancia*.

SERVIÇO PÚBLICO FEDERAL
MINISTÉRIO DO MEIO AMBIENTE
INSTITUTO BRASILEIRO DO MEIO AMBIENTE E DOS RECURSOS NATURAIS RENOVÁVEIS - IBAMA

LICENÇA PRÉVIA Nº 123/2002

O INSTITUTO BRASILEIRO DO MEIO AMBIENTE E DOS RECURSOS NATURAIS RENOVÁVEIS - IBAMA, no uso das atribuições que lhe confere a Lei nº. 5938, de 31 de agosto de 1981, que dispõe sobre a Política Nacional do Meio Ambiente, alterada pela Lei nº 7.804, de 20 de julho de 1989 e regulamentada pelo Decreto nº. 99.274, de 06 de junho de 1990 e considerando, ainda, a Portaria n o 1741, de 14 de setembro de 2001, **RESOLVE:**

expedir a presente Licença Prévia a:

EMPRESA: COMPANHIA AGRÍCOLA SONORA ESTÂNCIA - CASE
ENDEREÇO: Rua Purpurina , nº 131, conj. 131 - Pinheiros
CEP: 05435-030 **CIDADE:** São Paulo **UF:** S. P.
TELEFONE: (11) 3032-3888 **FAX:** (11) 3032-3888
CGC/CPF: 47.902.283/0001-20
REGISTRO NO IBAMA: Processo nº 02001.000229/99-46

relativa ao empreendimento Aproveitamento Hidrelétrico PCH Aquarius, a ser implantada no rio Correntes, entre os municípios de Sonora/MS e Itiquira/MT.

O empreendimento tem por objetivo a geração de 5 MW de energia, um canal de adução trapezoidal de 350 m, a partir do aproveitando de uma soleira natural, e um conduto forçado de 160 m, até a Casa de Força com duas unidades geradoras e não haverá formação de reservatório.

Esta Licença Prévia é válida pelo período de 01 (um) ano, a contar da presente data, observadas as condições discriminadas no seu verso e nos demais anexos constantes do processo que, embora não transcritos, são partes integrantes deste licenciamento.

Brasília, 25 ABR 2002

DONIZETTI AURÉLIO DO CARMO
Diretor de Licenciamento e Qualidade Ambiental