

Environmental Examination Report

(1) Project Name

Hydropower Plant Project

(2) Project Site

Republic of Colombia , Antioquia

(3) Project Outline

Construction of Hydropower plant

(4) Category

A

(5) Reason of Categorization

This project falls into a sensitive sector, has sensitive characteristics, and is located in sensitive area under the Environmental Guideline.

(6) Environmental Permission

EIA report for the project was prepared based on the laws and regulations of the Republic of Colombia, and was approved by Ministry of Environment, Housing and Territorial Land (MAVDT) .

(7) Anti-Pollution Measures

Air quality during construction and projected value for water quality during operation are in compliance with the local standard.

(8) Natural Environmental Considerations

There are some rare species living around the project site. If any rare species are found, appropriate measures will be put in place.

(9) Social Considerations

Resettlement under this project is undertaken based on the Resettlement Plan approved by MAVDT.

(10) Others and Monitoring

During construction, air quality and noise will be monitored. During operation, quality of water, ecosystem and level of lives of the resettlement people will be monitored.

Questions

Q1. Please provide the address of the project site.

Address of the project site : Amalfi, Anorí, Gómez Plata and Guadalupe, Antioquia, Colombia
Antioquia, Colombia

Q2. Please provide brief explanation of the project.

The site of the Porce III hydroelectric project is on the Porce River, approximately 147 km northeast of the City of Medellín, in the Department of Antioquia, in the jurisdiction of the towns of Amalfi, Anorí, Gómez Plata, and Guadalupe.

The Project consists of the impoundment of the Porce River by construction of a 151 m-high CFRD dam with a 400 m-long crest, with its spillway built on the left abutment, having a discharge capacity of 11,350 m³/s, controlled by four radial gates and a ski jump-type deflector. The general scheme is complemented by the dam diversion works, the low-level outlet and power generation components comprising the headrace tunnels and shafts, an underground powerhouse composed of two caverns (turbine-generator and transformers), ventilation, gate and cable galleries and a tailrace tunnel that returns the flow back to the Porce River through a dissipation channel. The powerhouse has an installed capacity of 660 MW distributed in four units, producing 4,254 GWh / year (3,444 GWh / year firm). The first generation unit is scheduled to enter into commercial operation in the second half of 2010; the rest during the 2011.

Q3. Will JBIC loan be applied to a new project or an executing project? In case of executing project, please inform the presence of strong claims by local residents.

- | | |
|--|---|
| <input checked="" type="checkbox"/> New Project | <input type="checkbox"/> Executing Project (with Claim) |
| <input type="checkbox"/> Executing Project (without Claim) | <input type="checkbox"/> Others (Please specify) |

Q4. In case of this project, is it necessary to execute Environmental Impact Assessment (EIA) based on the laws or regulations? If necessary, please inform the progress of EIA.

- | | |
|--|---|
| <input checked="" type="checkbox"/> Required (Completed) | <input type="checkbox"/> Required (Under execution or under planning) |
| <input type="checkbox"/> Not Required | <input type="checkbox"/> Others (Please specify) |

Q5. In case that EIA is already completed, please inform whether EIA report is already approved based on the environmental assessment system or not. If EIA report is already approved, please provide the date and name of authorities of the approval.

- | | |
|--|---|
| <input checked="" type="checkbox"/> Approved (without condition) | <input type="checkbox"/> Approved (conditional) |
| <input type="checkbox"/> Under approval process | <input type="checkbox"/> Others (Please specify) |

Date of Approval : 16 May 2003

Name of Authorities : Ministerio de Ambiente, Vivienda y Desarrollo Territorial

Q6. If environmental permit(s) other than EIA is required, please provide the name of required permit(s). Have you obtained required permit(s)?

- | | |
|--|---|
| <input checked="" type="checkbox"/> Obtained | <input type="checkbox"/> Required, but not obtained yet |
| <input type="checkbox"/> Not required | <input type="checkbox"/> Others (Please specify) |

Name(s) of required permit(s) : Environmental License (Ministerio de Ambiente, Vivienda y Desarrollo Territorial) and Declaratoria de Utilidad Pública (Ministerio de Minas y Energía)___

Q7. Will the loan be used for the undertaking that cannot specify the project at this stage (e.g. export or lease of machinery that has no relation with specific project, or Two Step Loan that cannot specify the project at the time of loan agreement)?

NO

If you answered "Yes", it is not necessary to reply to the following questions.
If you answered "No", please reply to the following questions.

Q8. Are there any environmentally sensitive area shown below in and around project site?

YES

If you answered "Yes", please select applicable items by marking, and reply to following questions.
If you answered "No", please reply to questions 9 and after.

- (1) National parks, protected areas designated by government (coastal areas, wetlands, habitats of minorities or indigenous populations, heritage sites, etc.)
- (2) Primeval forests, tropical natural forests
- (3) Ecologically important habitats (coral reefs, mangrove, tidal flats, etc.)
- (4) Habitats of endangered species of which protection is required under local laws and international agreements.
- (5) Areas that have risks of large scale increase in soil salinity or soil erosion
- (6) Desertification areas
- (7) Areas with special values from archaeological, historical and/or cultural viewpoints
- (8) Habitats of minorities, indigenous populations, nomadic people with traditional life style, or areas with special social value

Q9. Does the project involve following elements?

YES

If you answered "Yes", please describe the scale of applicable elements, and reply to the questions 10 and after.
If you answered "No", please reply to questions 11 and after.

- (1) Involuntary resettlement (Number of resettlers: 2689) The total number of resettlers will be 494 families and 650 miners. So far, 474 families and 637 miners have been resettled. According to current schedule, it is expected to complete all the resettlements before the plant operation.
- (2) Pumping of groundwater (Scale: ton/year)
- (3) Land reclamation and/or development (Scale: 5200 ha)
- (4) Deforestation (Scale: 550 ha)

Q10. Please reply to this question only in case that the project involves some of the above (1) to (4) elements. In the country where the project is planned, are there any regulations on a scale of the elements asked in question 9? If the country has such regulation, please answer whether the project satisfies the regulation or not.

- Regulation is applicable (satisfied not satisfied) No regulation
 Others (Please specify)

The Colombian Ministry of Mines and Energy (Ministerio de Minas y Energía) shall proclaim the area required

for the construction of the Project as a public utility and social interest zone. This was done by means of Executive Resolution 050 del 16/April/2003. Then, according to regulations, a tripartite committee was established, composed of three members, one designated by the Colombian Agustín Codazzi Geographic Institute (Instituto Geográfico Agustín Codazzi), one designated by local communities and the third one designated by EPM. This committee agreed on and produced the "Unitary Prices Manual", which was validated and approved by the Ministry of Mines and Energy. The "Unitary Prices Manual" contains thorough criteria and prices to calculate prices of land, indemnifications, etc.

Before the commencement of works, the Colombian Ministry of Environment (Ministerio de Ambiente, Vivienda y Desarrollo Territorial) granted the Environmental License, by means of Resolution 0561, 16/May/2003, which contains the Environmental Management Plan (Plan de Manejo Ambiental -PMA). The resettlement program is included and was approved within this PMA.

Please reply to questions 11 and after.

Q11. Will JBIC share in the project be equal or less than 5% of the total project cost, or the total amount of JBIC loan equal or less than SDR 10 million?

NO

If you answered "Yes", it is not necessary to reply to the following questions.
If you answered "No", please reply to questions 12 and after.

Q12. Does the project belong to either of the sectors that impact on the environment is deemed immaterial or is not anticipated under normal conditions (e.g. maintenance of the existing facilities, non-expansionary renovation project, acquisition of rights or interest without additional plant investment)?

NO

If you answered "Yes", it is not necessary to reply to following questions.
If you answered "No", please reply to the questions 13 and after.

Q13. Does the project belong to the following sectors?

YES

If you answered "Yes", please specify the sector by marking, and reply to questions 14 and after.
If you answered "No", it is not necessary to reply to the following questions.

- (1) Hydro power plant, Dam or water reservoir
- (2) Thermal power plant
- (3) Mines
- (4) Development of oil and gas
- (5) Pipeline
- (6) Steel industry (with large scale furnace)
- (7) No-ferrous metal refining
- (8) Petrochemical (including manufacturing of raw materials and petrochemical complex)
- (9) Terminal of oil, gas and chemicals
- (10) Petroleum refining
- (11) Paper and pulp
- (12) Manufacturing and/or transportation of hazardous substances (specified by international agreement)
- (13) Road, railway or bridge
- (14) Airport
- (15) Port
- (16) Waste material processing or treatment

- (17) Treatment of sewage and/or waste water that includes hazardous substances or executed at environmentally sensitive area
- (18) Power transmission and/or distribution lines (including large scale involuntary resettlement, large scale deforestation or submarine cable)
- (19) Tourism (Construction of hotel, etc.)
- (20) Forestry or tree planting
- (21) Agriculture (large scale project and/or project including irrigation)

Q14. Please provide information on the scale of the project (project area, area of plants and buildings, production capacity, amounts of power generation, etc.) Further, please explain whether an execution of EIA is required on account of the large scale of the project in the country where the project is implemented.

Dam:

Type: concrete face rockfill dam (CFRD)
 Height: 151 m.
 Crest length: 400 m.
 Crest width: 8m
 Total reservoir volume: 170 hm³.
 Basin area up to the intake: 3 756 km²
 Maximum operating level: 680 masl
 Total foundation excavation volume: 110,000 m³
 Total plinth excavation volume: 455,000 m³
 Total dam rockfill volume: 4,136,000 m³

Intake: submerged; design flow: 235 m³/s. The minimum level of intake is 604 masl. The maximum operating water level is 680 masl. Then, the maximum intake submersion is 76 m.

Spillway:

Type: open channel (chute) controlled by 4 radial gates.
 Location: left abutment.
 Discharge capacity: 11 350 m³/s
 Type of dissipation structure: ski jump deflector (radial).
 Total Length: 730 m.
 Width of the channel: 62 m.
 Total excavation volume: 4,700,000

Underground works:

Underground conveyance works	Area (m ²)	Length (m)
Dam diversion tunnel	98.4	667
Headrace tunnel	86.4	12,452
Lower headrace tunnel	86.4	274
Pressure shaft	83.3	159
Tailrace tunnel	93.4	828
Construction adit 1	32.1	521
Construction adit 2	32.1	649
Construction adit 3	32.1	705
Access tunnel	43.7	493

The powerhouse will have an installed capacity of 660 MW distributed in four units, producing 4.254 GWh / year (3.444 GWh / year firm).

According to Colombian law 99/1993, the Environmental License is required for Porce III Project. It was also required the EIA (Environmental impact assessment), which included the following aspects:

- Project description
- Environment description (physics, biotic and social)

- Identification of environmental impacts
- Evaluation of environmental impacts
- Management and Control of impacts (Environmental management actions, Monitoring plan, Contingency plan, Estimated cost of the environmental management plan)
- Public participation (information and consults with communities)
- Judgment by environment authorities (in order to get the environmental license).