RIO NORTE
HYDRO CORPORATION

PROJECT DESCRIPTION REPORT

19.7 MW ILAGUEN 3A HYDRO ELECTRIC PLANT PROJECT

BARANGAY SAN MIGUEL, MUNICIPALITY OF ECHAGUE, PROVINCE OF ISABELA

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I. BASIC INFORMATION ON PROJECT AND PROPONENT

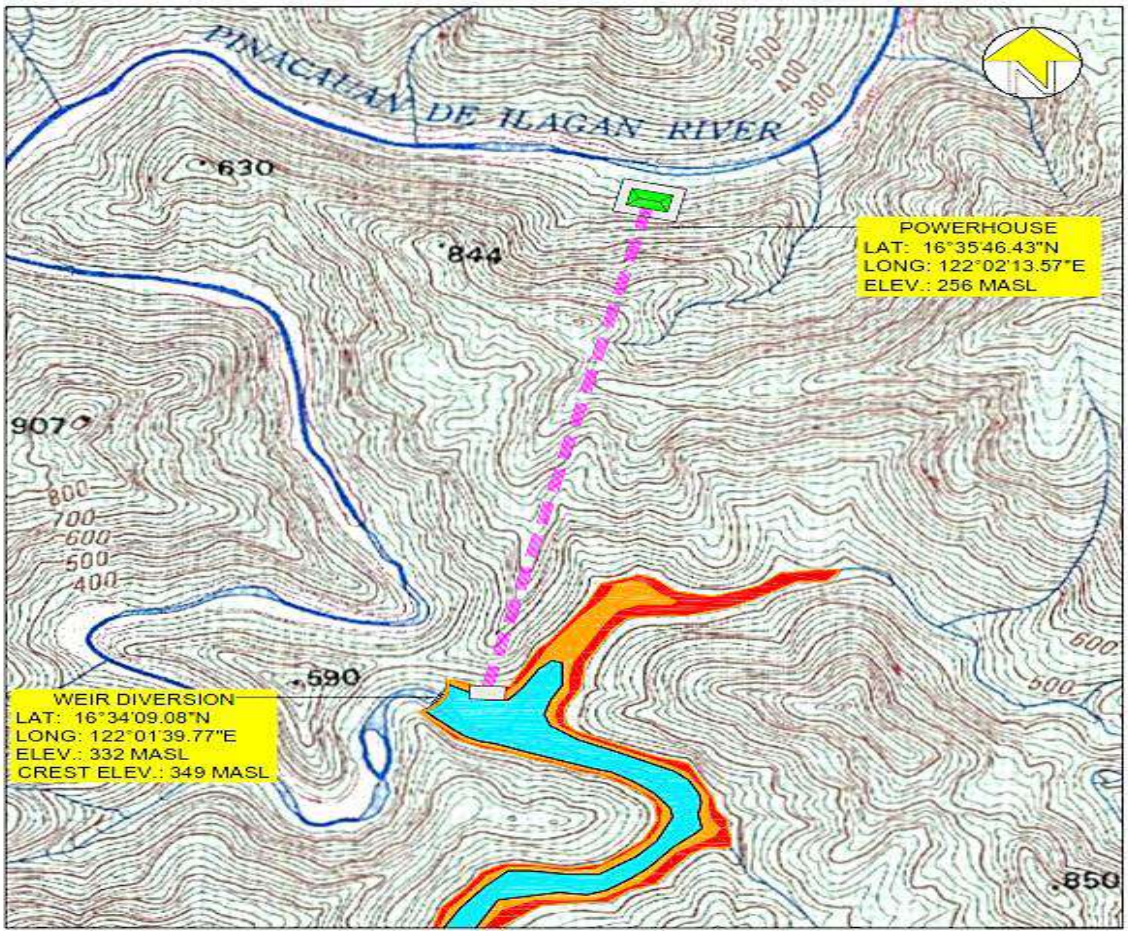
PROJECT NAME	:	19.7 Megawatts HYDRO ELECTRIC PLANT PROJECT
PROJECT STATUS	:	Proposed
PROPONENT	:	Rio Norte Hydropower Corporation represented by Mr. Oliver Y. Tan, President
BUSINESS ADDRESS	:	5/F Libran House Building, Legazpi Village Legaspi St. cor V.A. Rufino St., Makati City
CONTACT PERSON	:	Mariah Chryzl P. De Ramos Contact No. (02) 729-0307/+639165388277
PROJECT LOCATION	:	Barangay San Miguel, Echague, Isabela
PROJECT AREA	:	693 hectares (22.06 km length and 100 meters width)
PROJECT COMPONENT	:	Weir, Penstock, Powerhouse, Tunnel, Transmission Line Substation and Access Road (inundated area included)

II. PROJECT DESCRIPTION

2.1 Project Location and Area

The project is a combination of a run-off-river and weir type hydropower plant that could generate 19.7 MW and can produce 111,000,000 kW-hrs of power annually. The river that will be utilized for this project is the Pinacanauan de Ilaguen which lies along the mountainous terrains of the Isabela Province. Specifically, the project will be constructed at **Ilagan River HEP** located at Barangay San Miguel, Echague, Isabela with a geographical coordinates:

Coordinates of Weir	:	122 ⁰01’39.77” longitude	16 ⁰34’09.08” latitude
Coordinates of Powerhouse	:	122 ⁰02’13.57” longitude	16 ⁰35’46.43” latitude

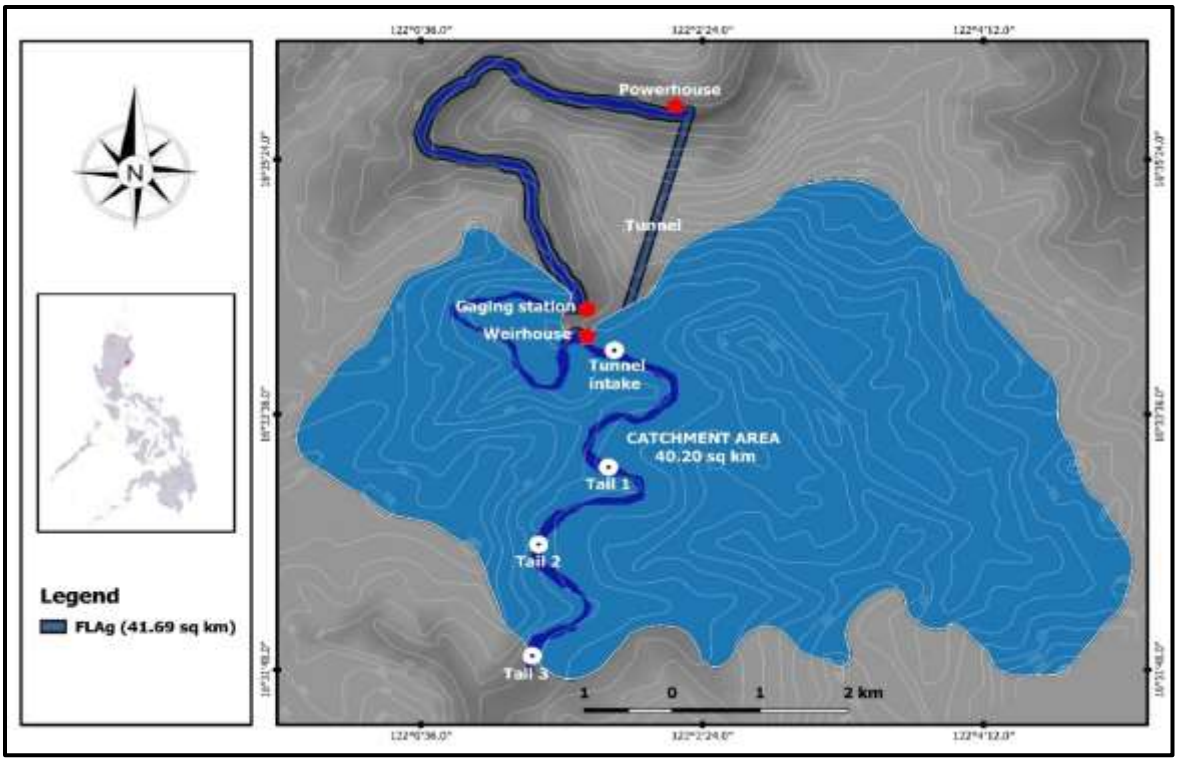


Topographic map of Ilaguen River in Echague, Isabela showing the location of the main structures of the proposed Ilaguen 3A Hydro Electric Plant Project (NAMRIA, 2006)

Proposed hydro will tap the potential of the Pinacauan De Ilagan River which flows northward and eventually exits through the main Cagayan River which is connected to the Babuyan Channel in Aparri, Cagayan. It will be located 950 meters downstream of the proposed bridge crossing and/or 5.3 kilometers upstream of the Ilaguen 2 Weir.

The dam site will be located approximately 11 kilometers upstream from the power plant along the river bank. A submerged intake is positioned upstream of the dam about 90.0 meter with an invert elevation at 340 masl.

A headrace tunnel connected into it will slope at 3.5% from the inlet to the outlet with a length of 2950 meters, a steel lined section (penstock) about 250 meters in length then to the turbine and power house.



Actual Geography Map of Ilaguen River Site 3A

2.2 Project Rationale

As what is stated under the REVISED GUIDELINES FOR COVERAGE SCREEENING AND STANDARDIZED REQUIREMENTS, under the Philippine EIS System (EMB Memorandum Circular, July 2014) the proposed Ilaguen River Hydro Electric Power Plant, falls under Infrastructure Projects: Category A for the Dam; and Category B for the Hydropower Facilities and the access roads: requiring the completion and submission of the Environmental Impact Assessment (EIA), a process that involves evaluating and predicting the likely impacts of a project (including cumulative impacts) on the environment during construction, commissioning, operations and abandonment. It also includes designing appropriate preventive, mitigating and enhancement measures addressing these consequences to protect the environment and the community's welfare.

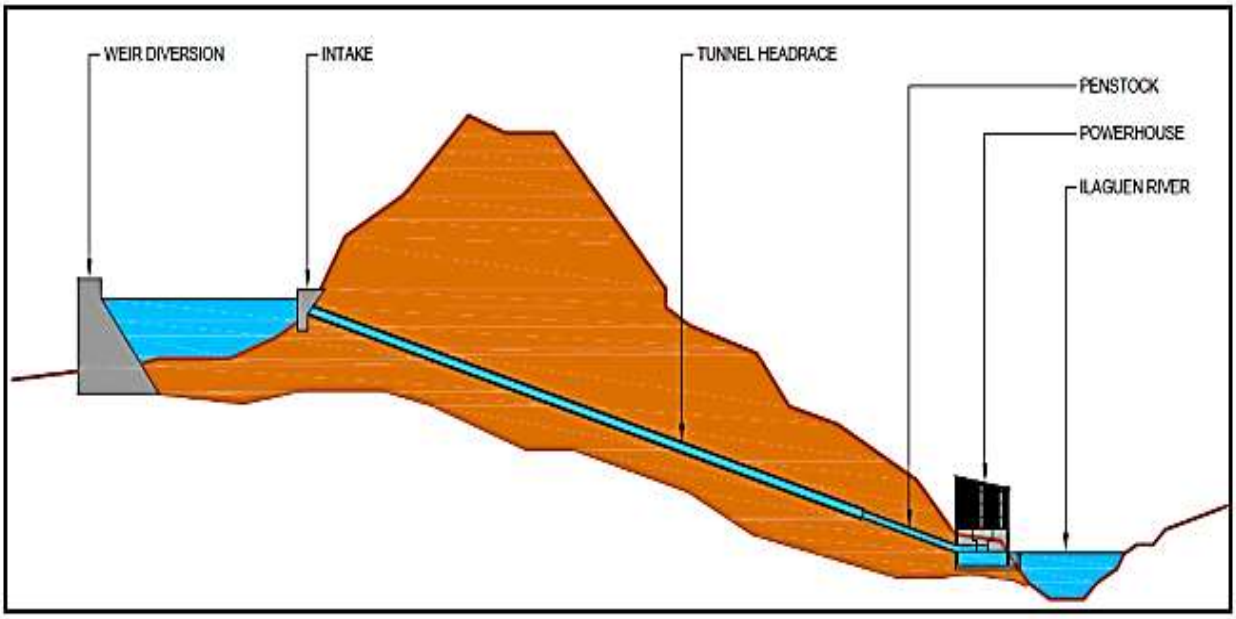
The Power Transmission Lines and substation/switchyard however are Category D: not covered and will secure Certificate of Non Coverage (CNC) Rio Norte Hydropower Corporation is committed to submit this Environmental Impact Assessment as required for the issuance of the Environmental Compliance Certificate, and other pertinent requirements for securing the Certificate of Non Coverage as may be appropriate therein.

The Project concept is based on diverting partial flow of Ilaguen River by means of a diversion weir and conveyed to the Power House where water is returned to its downstream. By this concept, a 93.0 m head can be obtained for power generation which then permits a maximum available capacity of 19.7 MW.

Proposed construction of approximately 14 km access road/road right of way will be a big help to the locality to facilitate/provide accessibility to other barangays and by improving their mobility this will enhance the flow of economic activities in the said barangay. Thus, delivery of basic social and economic services will be ensured and ecotourism activities in the municipality will be expected to boom through the accessibility provided by the project.

2.3 Project Development Plan, Process and Components

This project follows the typical components of a hydroelectric power project installation which consist of the dam, submerged intake, tunnel (concrete lined and steel lined) and the powerhouse containing turbine and generator.



Hydraulic Profile showing the main structures of the proposed Ilaguen 3A Hydro Electric Plant Project (AT Dinum Company, 2017)

This is characterized by a 45-m high dam that shall impound water at an elevation of 370 masl and drops it off with a 102 masl net head to the powerhouse which holds two (2) Francis turbines that can deliver an estimated power of 19.7 MW.

A Hydropower development includes a number of structures and the design, which will be dependent upon the type of scheme, the site conditions, the access to construction materials and the local building traditions in the country or region.

Hydraulic and Civil Structures

Weir	Elevation	370 masl
	Height	45 m
Penstock	Type	Steel
	Dimension	2,946 m x 5 m
Powerhouse	Elevation	268 masl
Substation	Type	6.9kV – 69 kV; 60 km to tapping pt.
Turbines	Type	2x Francis turbines
	Rated discharge	27.5 m^3/s
	Rated net head	111 m
Access Roads		14.722 km

It will utilize a river discharge of 27.5 cubic meters per second (cms) diverting it to the hydraulic structures producing a capacity of 19.70 MW. In which, the scheme is to construct a 20-meter weir structure to increase the gross head and to divert the water into the intake, 900 meters approximately upstream from the weir location (see project layout). The weir will be made of Roller Compacted Concrete (RCC) and will have a design configuration perpendicular to the river flow, while the intake will be made of reinforced concrete with steel gates.

Catchment area above weir site	:	186 hectares
Gross Head	:	93.00 m
Net Head	:	85.00 m
Design discharge	:	27.5 m^3/s
Exceedance Percentage	:	28.00%
Reservoir full supply level	:	369 mAD
Nominal Main Voltage	:	69 KV
Proposed Connection Point to Plant Substation	:	53.5 km
Design flood at PH (1:500 AEP)	:	269 mAD
Installed capacity	:	19.7 MW
Mean annual energy (at take-off point)	:	111 GWh
Plant factor	:	49.2%

As stated the catchment area is still teeming with trees and shrubs, most of which are first-growth ones in nature, with just a few areas covered by grasses. Hence, only small siltation of the pond will occur, besides, the pond does not require an active poundage volume, so this would not constitute a risk for the operation of the project.

The transmission line configuration has been designed on the assumption that each single line shall be able to carry at least 50 MW or approximately 419A per line under all operating and weather conditions based on ambient temperature of 35°C and 75°C operating temperature.

These are all associated rights of way and the final routing will need to be finalized in close co-operation with National Grid Corporation of Philippines (NGCP)/Distribution Utility (ISELCO 1) and as such any parameters and suggestions for the transmission lines and substation are purely indicative.

The line specification, line profile and tower schedule shall be confirmed with NGCP and other local authorities. Transmission line characteristics outlined in this Design Report are specified in the table below.

Parameters	Design
Transmission line distance (approximately)	1. Proposed connection point of ISELCO 1 Batal Line to connection point of ISELCO 1 Garit Line = 5.2 km 2. Proposed connection point of ISELCO 1 to Alicia Substation = 9.2 km 3. Proposed connection point of Ilaguen 3A to Ilaguen 3A Plant Substation = 53.5 km 4. Alicia Substation to NGCP Cauayan Substation = 22 km Total = 89.9 km
Rated Voltage	69 kv
Maximum Voltage	
Connection Point	Between the Proposed 69 kV Garit Line and Alicia Substation
Total transmission Line Capacity	50MW

A. Ilaguen 3A HYDRO ELECTRIC POWER PLANT (HEPP)- WEIR

(N 16° 34' 09.08" and E 122° 01' 39.77", elevation 349 masl)

Proposed Weir Site Location. Source: Mott MacDonald

Weir site is about 20km from Brgy. San Miguel and could be reached after 12 hours of difficult trek that shall cut across a mountain divide with at least 700m difference in elevation separating the Ilaguen River valley.

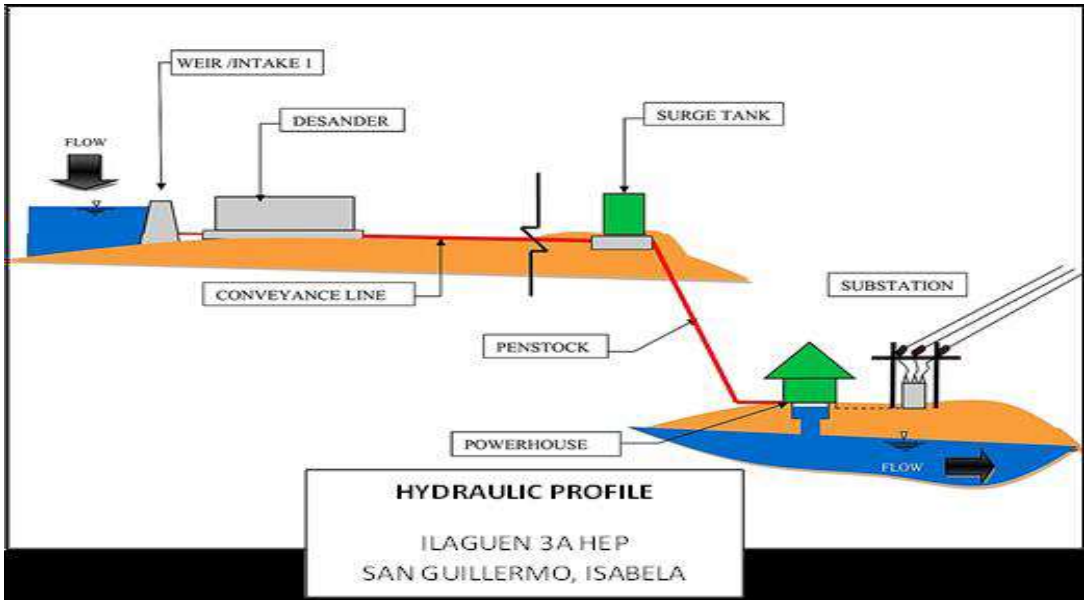
B. Ilaguen 3A HYDRO ELECTRIC POWER PLANT (HEPP)- POWERHOUSE

(N 16° 35' 46.43" & E 122° 02' 13.57", elevation 256 masl)

As powerhouse accommodates all the electro-mechanical equipment such as turbine, generator, and control panel so as to protect from rain and other weather effects, all equipment must also be handled carefully and only authorized persons are allowed to operate or handle these. Its size must be also big enough to have an easy access of operation.

Proposed Power House site looking downstream. Source: Mott MacDonald

The basic hydraulic structures that compose a Mini Hydro Power Plant is:



The intake will be a reinforced concrete structure founded on sound rock at the portal of the headrace tunnel. This will allow water to be drawn from the reservoir and directed into the power waterway, leading ultimately to the power station for electricity generation.

Also, it will be built on the right bank of the river (in a small creek), as shown in Figure below.

Positioning of Intake structure, Source*: Google Earth*

The intake is proposed to be a single lane with trash rack, stop logs and gates reducing to the headrace tunnel. Relevant details of the intake are summarized in Table below.

Details	Parameters	Velocities Turbine Design Flow	Velocities Intake Design Flow +10%
Design Flow (m^3/s)	27.5		
Intake Main Details			
Width	5m		
Height	11m		
Flow Area	$55m^2$		
Intake Velocity		0.62	0.68
Trash rack Details:			
Blockage Allowance	10%[1]		
Assumed Bar W idth	12mm		
Bar Spacing	25mm		
Available Flow Area (10% blockade)	$33.7m^2$	0.82	0.9
Available Flow Area (No blockade)	$37.4m^2$	0.74	0.81

Source: MMS Intake and Trashrack Assessment
1. 10% blockage assumed for hydraulic sizing

2.4 Description of Project Phases

2.4.1 Pre-Construction/Pre-Development Phase

With the preparation of the site before construction includes clearing of the affected area due to clearing of trees. Activities are for preparation of plant layout and making of temporary facilities and selecting staging area for construction materials.

2.4.2 Construction/Development Phase

This phase includes the construction of the temporary facilities at the following site: Power House, Surge Tank, Headrace, and Weir Site. During the construction of each components, the following activities will be undertaken for the following components:

Weir

- Excavation for structure
- Gravel Bedding
- Top Slab
- Fish Pass construction
- Riprapping Works
- Sluice Gate

Penstock

- Excavation
- Back Fill with Compaction
- Slope Projection
- Saddle and Anchor Blocks
- Formworks
- Sand Bedding
- Trifurcation, Fittings and Accessories

Power House

- Excavation for Structure
- Embankment, Grading & Compaction
- Slope Protection

Tailrace Channel

All Weather Access Roads

Construction materials to be included are gabions, boulders, cement, aggregates, masonry, steel bars, galvanized iron, etc. Construction equipment to be used by the proponent or its contractors will utilize are Backhoe, Hand Rill Machine, Plate Compactor, Dump truck, Pay loader, Water pump, Generator set, Chainsaw and Bulldozer.

Construction Methods will strictly follow the designs and specification as prepared by the project architects/ engineers in accordance with various provisions of the National Building Code of the Philippines. The various infrastructure have been designed with due considerations to the estimated loading, handling, deflection, and earth quake occurrence to ensure its soundness and safety.

2.4.3 Operational Phase

Water is diverted from a river by the weir to the headrace. The required amount of water will be sent into a pipe called a penstock. The penstock feeds the water downhill to the power station's turbines. Because of the difference in relief, potential energy from the water up river is transformed into kinetic energy while it flows downriver through the penstock, giving it the speed required to spin the turbines that in turn transform this kinetic energy into electrical energy then through the transmission lines. Additionally, there is no alteration of downstream flows, since all diverted water is returned to the stream by the tailrace.

The run-off-river power plants consist of a weir across the full width of the river to provide the head needed for running the turbines. Whatever water is not needed for generating electricity spills over the weir. Such installations have a reservoir behind the dam but flooding is minimal and it is not used to store water for later generation.

The operation of the hydropower plant will involve sedimentation at the weir. Sediment particles carried by river flow into the weir would have impact on the turbine system and other components of the hydropower plant. Settling basins and sluice gates will minimize the entry of silt into the intake canal by providing a deep and relatively-still water pond in front of the head works.

This operation would also result to the delay upstream fish migration. Fish pass enable fish to pass around the barriers by swimming and leaping up a series of relatively low steps into the waters on the other side. The velocity of water falling over the steps has to be great enough to attract the fish to the ladder.

2.4.4 Abandonment phase

Abandonment in this context is understood as terminating operations. It will be very unlikely to abandon such project in the future since the province needed energy and the project was projected to be managed by the proponent for fifty (50) years. After fifty years, the project will be turned over to the Local Government Unit (LGU).

The proponent plans to operate the Ilaguen 3A Hydro power generation project for a maximum of 50 years. The proponent will submit the abandonment plan to the DENR two (2) years prior to decommissioning, should it consider abandoning the project. The plan will discuss the parameters to be considered during abandonment phase, especially on the impact of the operation of the project on land, water, air and people.

The detailed Abandonment and Decommissioning Plan (ADP) will be done and submitted to the EMB Central Office one year before the actual decommissioning activities. The ADP will include specific programs for: i) land or soil restoration, decontamination, and remediation; ii) strategies and methods for final rehabilitation of the environment disturbed by the project; and iii) land use suitability for land disturbances.

2.5 Project Wastes

During decommissioning, it is expected that wastes will be generated. Some of these are listed below: Building Demolition Wastes: Building materials, packaging, and rubble resulting from renovation, repair, and demolition operation on pavements and other auxiliary facilities and structures. Bulk Wastes: Large solid wastes such as appliances, furniture, and other oversized wastes which, complicates their disposal by normal solid waste collection.

Special Wastes: Wastes that may have particular health, safety, and environmental risks. Such include such materials (e.g., floor tile, plumbing insulation, siding and roofing), materials with lead-based paint coatings (e.g., siding, walls, furniture, and cabinetry), lighting wastes (e.g., mercury containing lamps, PCB containing ballast's), electrical components (e.g., oil containing switches and transformers), and appliances and other equipment (e.g., refrigerators and air conditioning compressors containing refrigerants and oils). One of the critical part of the decommissioning process is the massive demolition of facilities and auxiliary structures. The following will be done before and during the demolition activities:

- Ensure that the contractor(s) had developed a Waste and Recycling Plans for the demolition activity;
- Consider hand-deconstruction and salvage techniques to recover valuable materials;
- Segregate demolition wastes to facilitate on-site or off-site reuse or recycling;
- Verify that special wastes with particular health and safety, handling and disposal concerns have been identified prior to any renovation or demolition activities and that these materials have been addressed in project site work plans and health and safety plans;
- Storage of demolition wastes to minimize run-on and run-off. Provide appropriate sediment controls to ensure that water infiltration and other weather damage to waste materials is prevented;
- Establishment of appropriate procedures for the management of special wastes such as those mentioned above;
- Transport of wastes in vehicles that are compliant with regulatory requirements and that the materials due for

disposal securely bundled and covered to prevent spillage during transport;

- Proper disposal of wastes that cannot be reused, recycled, or composted, and
- Proper recording of demolition debris transport and disposal.

2.6 Manpower

The Project is estimated to employ not more than 300 workers during the construction phase composed of skilled workers and laborers. Qualified residents within the area will be prioritized for employment.

An average of 50 workers will be needed at any given time during the operation stage of the project. Qualified engineers and some technical staff will also be needed for the project for supervisory and other monitoring functions. Security personnel, to ensure the safety and security of the people involved in the project, will likewise be present at all times.

2.7 Project Cost

The estimate total project cost is **Php 3,074,752,763.00** which covers civil and electro-mechanical works, detailed engineering designs and supervision during construction, acquisition of road and backwater row and other incidental expenses.

2.8 Project Duration and Schedule

The operation of this project is expected to commence once all permits and clearances are already secured for smooth implementation of the project.

3 OVERVIEW/GENERIC DESCRIPTION OF THE BASELINE ENVIRONMENT

The baseline environmental condition is discussed in this Section. The environmental baseline characterization, the utilized data and other information were taken from secondary sources. The impact assessment and mitigation were also incorporated.

Overall, the vegetation in Ilaguen 3a project area was dominated by lowland mixed dipterocarp forest characterized by the tropical lowland evergreen rain forest (natural habitat) and the croplands and shrub land/ brush land (modified habitat). The land cover map of NAMRIA (2015) revealed the natural habitats and the modified habitats of flora and fauna in Ilaguen 3a project site.

A natural habitat is an environment congregated by biological communities of native flora and fauna largely and maintains its primary ecological functions while a modified habitat is altered by anthropogenic activities (ADB, 2012). The natural habitat of the Ilaguen 3a site is the tropical lowland evergreen rain forest and Ilaguen more specifically the lowland mixed dipterocarp forest. Located Far East of the San Miguel village, the natural habitat is a contiguous forest rooting from the Northern Sierra Madre Natural Park (NSMNP) – one of the few remaining biologically rich habitats in the Philippines. Within the areas around the powerhouse, tunnel and inundated area, approximately 99 % is a natural habitat of lowland mixed dipterocarp forest.

West of the project site is dominantly a contiguous modified habitat. Areas like woody shrub lands/ brush lands, grasslands and agricultural lands as well as the built-up areas belong to the modified habitat classification of the Ilaguen 3a site. To a large extent, the agricultural lands were typically tilled with corn, rice and banana after kaingin. Gmelina (*Gmelina arborea*) and Mahogany *(Swietenia macrophylla*) and fruit trees like Guyabano (*Annona muricata*) and Jackfruit/Langka (*Artocarpus heterophyllus*) were planted along the edges observed along the access road. Land cover like the shrub lands and brush lands with patches of naturally-growing tree flora were equally large modified habitat as the agricultural land. Pioneer species Binunga (*Macaranga tanarius*) dominated those habitats and showed signs of initial recovery from conversion of forest to kaingin farm and timber poaching. Those threats to forest were frequently observed in Ilagauen 3a site.

The forest of Ilaguen site 3a hydroelectric plant project was a young to medium-old forest dominated by tree flora with DBH class of between 21 cm to 50 cm, representing 65 % of the total 1,430 individual observations. Secondary forests are forests disturbed at a certain point in time that are regenerating mainly by natural processes after a long period from the time of disturbance.

The inventory reported 1,430 individual flora and were identified to 29 families and 59 species. The *Dipterocarpaceae* family dominated among the 29 families observed in the site. The inventory recorded 1,084 individuals of dipterocarp out of the 1,430 total individuals. *Euphorbiaceae, Moraceae,* and *Fagaceae* families showed small representation of about 5 % for each family across plots. The remaining 25 families were found at a marginal level. The data also suggest that Ilaguen Site 3a site has a good representation of diversity at the species level despite the site being characteristically dipterocarp-dominated, for one. On another important note, the Ilaguen 3a site area is overlapping with an old logging road that is the current access to the forest hence its resources as well. White Lauan (*Shorea contorta*) and Red Lauan (*Shorea negrosensis*) collectively account for 55 % of the 1,430 flora. Bagtikan (*Parashorea malaanonan*), Apitong (*Dipterocarpus grandifloras*), Mayapis (*Shorea palosapis*), and Guijo (*Shorea guiso*) co-dominated the site. These four species account for 204 individual observations.

The lowland mixed dipterocarp forest showed more diversity in fauna compared to cropland and shrub land habitats. To set the expectation of the reader, however, it is worth-noting that the observations mostly of endemic species although recorded in stations within shrub lands and agricultural areas were actually seen and/or heard in the lowland mixed dipterocarp forest, kilometers away from the waypoint of observer.

Ilaguen 3a reported a total of 1,366 individuals of fauna and were identified to 117 species, representing 3 phylla, 10 classes, 28 orders, and 69 families. Out of these 117 species, almost 40 percent (or 46 species) is classified as endemic species based on the IUCN Red List of Threatened Species. More specifically, the survey found 36 species endemic to the Philippines and 10 species endemic to Luzon Island.

Large bird species identified to the Northern rufous hornbill, Luzon hornbill and the raptor Northern Luzon hawk-eagle in Ilaguen 3a were found to be forest-obligate species and had narrow ecological niche. In other words, those species require forest habitats in good condition. The raptor by its natural characteristic was observed in forest edges as well as non-forest areas to hunt for food. The results of the survey, however, do not suggest that the Northern Luzon hawk-eagle expands its primary habitat only despite the observation of its behavior in food hunt in Ilaguen 3a. Ten species of fauna reported to be listed in the threatened and prohibited species under the Philippine Wildlife Act. The species included the endangered Northern Philippine hawk-eagle, the near threatened Luzon striped-babbler, Rufous coucal, Golden-crowned babbler, and Giant Philippine frog, and the vulnerable Northern rufous hornbill, North Philippine dwarf-kingfisher, Philippine warty pig, Philippine coin spider, and Common carp.

Overall, the Ilaguen 3a site is a reservoir is a long and wide river system and forms part of a sub-watershed. The location of the Ilaguen 3a main structure components – being situated in at the eastbound foothill of a mountain range – is an advantage in limiting the possibility of the hydropower plant operations impairing of the various system functions of the natural habitats within the vicinity, that is, the lowland mixed dipterocarp forest. The future development of the access road network, however and at a certain degree, could have a minor impact to the Northern rufous hornbill and Northern Luzon hawk-eagle in the locality of the lowland mixed dipterocarp forest at the end section of the road. Nonetheless, the recommended actions of setting up of habitat protection system and habitat rehabilitation to encourage corridors if implemented properly are expected to maintain the integrity of the identified natural habitats and enhance the modified habitats.

4 ENVIRONMENTAL MANAGEMENT PLAN

Environmental management and planning processes are generally designed to optimize resources and minimize environmental damage. The Environmental Management Plan (EMP) translates various key mitigation and enhancement measures for major identified impacts

into concrete plans of action to ensure appropriate implementation. It also provides the estimated investment requirements and commitments/guarantees to carry out the proposed plan.

The Environmental Management Plan comprises the following components:

- Construction Contractor's Management Program
- Watershed Management Program
- Information, Education and Communications Program
- Social Development Program
- Emergency Preparedness Plan
- Environmental Monitoring Plan
- Institutional Plan
- EMF and EGF Commitments

A. Construction Contractor's Management Program

To ensure effective environmental management of a project, all participating parties must know their responsibilities related to the protection of environmental and socioeconomic resources and be committed to implementing actions and measures to fulfill these responsibilities. The Contractor's plan to minimize construction impacts to the environment must include the following: Engineering Works, Labor Force, and Occupational Health and Safety.

B. The Watershed Management Program (WMS)

The following WMS programs and projects must be vigorously pursued to protect, rehabilitate the upper watershed, and provide funds for the implementation of the following programs:

1. Delineation of Project Area Management Zones
2. Erosion Control Program in Agricultural Lands
    - Agroforestry Component
    - Nursery Establishment
3. Upper Watershed Management Program
    - Forest Protection Component
    - Reforestation/Rain forestation Component
    - Nature Park and Ecotourism Component
    - Riverbank Stabilization
4. Fishery Resource Development Program
5. Establishment of the Watershed Management Office

C. Information, Education and Communications (IEC) Program

The IEC is a critical component in establishing support, linkages, and participation of the stakeholders in the project. Public consultations are needed to generate awareness, informed opinions/views, and suggestions/approaches. It is important that misconceptions are clarified and stakeholders are fully aware and informed about the project to eventually stimulate dynamic participation and support in the implementation of the development activities in the locality.

The components of the IEC are the following:

- Dissemination of the outputs of the EIA
- Information on the final design and engineering of the dam
- Information on project implementation and monitoring

The IEC program must be a continuing activity throughout all the stages of the project.

D. Social Development Program (SDP)

The Social Development Program must hinge on the framework of sustainable development where environmental protection and economic growth are geared towards improvement of the people's well-being and their environs. In this context, participatory planning, implementation and monitoring/evaluation of programs must be built-in in the program components. Gender sensitivity must ensure balance between the role of men and women in community activities. The involvement of the indigenous peoples constituting the ethnic dimension is also recognized for the sustainability of the project. Moreover, the process may also involve multi-sectoral networking. This means forging links with LGUs, POs, NGOs, tribal council, government line agencies, partner funding institutions, and other community development partners, and bolstering efforts in linking together of services, agencies/institutions to coordinate and mobilize resources.

Thus, environmental management and planning in development projects take cognizance of the participatory approach, gender and culture sensitivity, and institutional development and propagates capability, responsibility and accountability as well.

In this light, SDP comprises the following components and sub-components:

- Employment Program
- Community Development Assistance

a) Support for Community Welfare (Assistance in the Establishment of a Tribal House, Delineation of the Ancestral Domain Claim, and Alternative Livelihood and Integrated Capability Building)
b) Physical Infrastructure Development

E. Emergency Preparedness Plan (EPP)
The purposes of this emergency plan are to:

- facilitate public safety by notifying all appropriate authorities, which will assist them to respond swiftly and effectively in the event of emergency
- provide information to all stakeholders in the event of emergency
- provide a plan of action for foreseeable flood emergencies affecting safety of the dam and the properties downstream
- provide a plan of action to carry out repairs and reduce impacts of any event that might occur

The component of the Emergency Preparedness Plan includes a warning system, preparedness program, trainings and drills, and an emergency transport system.

F. Environmental Monitoring Program (EMP)
The monitoring program is aimed at achieving the following:

1. monitor the project's compliance with the conditions set in the ECC
2. monitor the compliance with the Environmental Management Plan (EMP) and applicable laws, rules and regulations
3. monitor specific parameters identified
4. provide a basis for effective planning and management of environmental measure through the monitoring of actual project impacts vis-à-vis the predicted impacts in the EIS

A Multi-Partite Monitoring Team (MMT) will be created primarily to look into the compliance of the proponent with the ECC to be issued by DENR. This team shall be composed of representatives of concerned government agencies, LGUs exercising jurisdiction over the project area, tribal council, the academe, accredited NGOs, and RIO NORTE HYDROPOWER CORPORATION, It will be created by virtue of a Memorandum of Agreement (MOA) to be entered into by the major stakeholders along with the Environmental Monitoring Fund (EMF) to finance the operation of the MMT. The committee will meet regularly, initially to plan out its work schedule and establish linkages with existing concerned government agencies, LGUs, tribal council, academe and NGO/PO groups.

G. Institutional Plan

The proponent shall establish, operate and maintain an Environmental Management Office (EMO) for the Ilaguen river (site 3) Hydropower Project at the RIO NORTE HYDROPOWER CORPORATION Watershed and Management Office as part of its regular office.

The EMO shall:

a) Coordinate all activities of the contractors, LGUs and other agencies and local organizations, related to complying with the provisions of the ECC of the project;

b) Initiate and coordinate the implementation of the EMP in coordination with the concerned stakeholders, DENR Regional Office, and within the Project Management structure;

c) Serve as liaison between the proponent and DENR Regional Office, as well as with the host communities, LGUs, tribal leaders in all environment and social development matters related to the construction and operation of the project;

d) Spearhead the implementation of the Information, Education and Communications Program, Social Development Program, and Environmental Monitoring Program.

H. EMF and EGF Commitments (Project Guarantees, Commitments, Affirmation and Agreements)

The guarantees to ensure the implementation of the EMP, include among others, the following:

- RIONORTE's commitment to address all relevant environmental impact and mitigation measures as embodied in the EMP

- Incorporation of the environmental mitigation/enhancement measures in the contracts of construction contractors

- Signed MOA on the establishment of the MMT, EMF and EGF

5 ANNEXES

a. *Original Sworn Accountability Statement of Proponent*
b. *Work and Financial Plan of Ilaguen 3A HEP (19.7 MW)*
c. *General Arrangement Site Plan of Proposed Ilaguen 3A HEPP*
d. *Location of Plot in Proposed Ilaguen 3A HEPP*