EXECUTIVE SUMMARY

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Project Fact Sheet

Basic Project Information

Project Name: Panay-Guimaras-Negros (PGN) Island Bridges Project

Project Location: Municipality of Leganes, Iloilo, Municipalities of Buenavista and San Lorenzo, Guimaras, Municipality of Pulupandan, Negros Occidental

Project Components:

Section A

Project Components	Location/Area Jurisdiction	Length/ Area
Major Components		
Segment3.1 *(Interchange)*	**Panay** *K0+000~K0+555*	0.555 km
Segment 3.2 *(Sea Cross Bridge)*	**Panay-Guimaras** *K0+555~k5+525*	4.970 km
Segment 3.3 *(link road)*	**Guimaras** *K5+525~K11+435*	5.910 km
Segment 3.4 *Interchange*	**Guimaras** *K11+435~K13+005*	1.57 km

Section B

Project Component	Location/Area Jurisdiction	Length/ Area
Major Components		
Segment3.5 *(Interchange)*	**Guimaras** *K0+000~K1+902*	1.902 km
Segment 3.6 *(Sea Cross Bridge)*	**Guimaras –Negros** *K1+902~k15+012*	13.110 km
Segment 3.7 *(link road)*	**Negros** *k15+012~K18+260*	3.248 km
Segment 3.8 *（Interchange）*	**Negros** *K18+260~K18+557*	0.297 km

List of Interchange Alignments

Name of interchange	**Crossing pile No.**	**Footprint area (m^2)**	**Form of interchange**	**Crossing mode**	**Name and grade of crossed road**
Interchange at the starting point of Line B	K0+009	78498	Rhomboid	Overcrossing of mainline	COASTAL ROAD (Roundabout Road on Panay Island)
Interchange at the ending point of Line B	K11+420	80208	Rhomboid	Overcrossing of mainline	Roundabout Road on Guimaras Island
Interchange at the starting point of Line D	K1+068	211018	Partial clover leaf	Overcrossing of mainline	Circumferential Road (Roundabout Road on Guimaras Island)
Interchange at the ending point of Line D	K18+680	90262	Type B single horn	Overcrossing of mainline	National Highway (National Expressway on Negro Island)

According to preliminary estimation, about 89.16 hectares of land are permanently occupied by the project, including about 8.10 hectares in Leganes, Iloilo Province, about 34.97 hectares in Buenavista, Guimaras Province, about 24.25 hectares in San Lorenzo, Guimaras Province and about 21.84 hectares in city of Pulupandan, Negros Occidental Province. Prefabricated yard on Panay Island, Guimaras Island and Negros Island respectively, and three temporary terminals such as material terminal, abutment shipping terminal and segmental beam shipping terminal are proposed to be set.

Proponent Profile:

Proponent	**DEPARTMENT OF PUBLIC WORKS AND HIGHWAYS - Unified Project Management Office (DPWH-UPMO)**
Represented by **Address** **Tel. Nos.** **Webmail**	**VIRGILIO C. CASTILLO** Project Director, RMCI (B) - UPMO Bonifacio Drive, Port Area, Manila +632-304-3555
In Partnership with:	CCCC Highway Consultants Co., Ltd.

In Charge of ECC Application:

Company **Address** **Consultant/s** **Contact Nos.** **Email Address**	CHINA SHIPPING ENVIRONMENT TECHNOLOGY (SHANGHAI) CO., LTD 600 Minsheng Road, Shanghai City P. R. China Xinglong Chen / Yucai Bai +862158519207, +8613361821226 envir@coscoshipping.com; chen.xinglong@coscoshipping.com
Company **Address** **Consultant/s** **Contact Nos.** **Email Address**	KRC ENVIRONMENTAL SERVICES 381 Sto. Rosario St., Angeles City Ricardo A. Capule (0917) 713 2629; (02) 506 1409; (045) 4360520 krc.enviservices@gmail.com; racapule5@gmail.com

DESCRIPTION OF THE PROJECT'S EIA PROCESS

Initial screening using Annex A of the Revised Procedural Manual (RPM) Circular No 05 showed that the proposed project is Category A 3.4.3 Bridges and viaducts, new construction projects. The project is considered as new single projects that requires ECC application and to submit Environmental Impact Statement (EIS) report at EMB – Central Office. The format in Annex 1-A of MC 2014 for New Single Projects was used in this report.

The EIA was prepared in accordance with the RPM DAO 2003-30 guidelines. Site visits were made, verify project location, establish sampling stations for terrestrial flora and fauna, water quality, marine ecology, air, noise and soil quality, social survey; secondary data on geology, hydrology, oceanography. Additional secondary data were taken from government agencies, i.e., DOST-PAGASA. NSO, NWRB, LGUs, etc. and from related literature.

Terms of Reference of the EIA study

This document is prepared in accordance with the provision stipulated in the Revised Procedural Manual (RPM) for DENR Administrative Order No. 30 Series of 2003. Table below shows the issues raised by the stakeholders during the Technical and Public Scoping and how these were addressed in the EIS.

Main Issues Raised and Addressed in the EIA

Public Scoping/consultation meetings were conducted with stakeholders at the four (4) affected Municipalities: Municipality of Pulupandan in Negros Occidental, Municipality of Buenavista and San Lorenzo in Guimaras and Municipality of Leganes in Iloilo. The stakeholders are composed of LGU Officials, barangay councils, community leaders and representative from People's Organization and Government Agencies.

Based on the results of the interviews to the people in the community, the construction of bridges has mixed observation about the development of current scenario where it has benefits as well as drawbacks. The project is an indication of development because with proper transport bridge infrastructure, economic development is possible. There is possibility of attracting tourists and investors since they will be fascinated by the proper bridge system. Another benefit is that this project is creating employment opportunities to the people in the communities. According to the results of interview the people wants to involve or hire as a laborer. So, when the people are employed rather doing nothing, it contributes to the economic development. Considerations on the implementation of the project from the respondents are also acquired during the survey. The respondents mentioned that the project proponent should consider the needs of the people that will be affected. Just compensation on the affected houses should also be settled as well as consider the livelihood of those income that will be affected. Appropriate implementation of the project should consider so that the positive effects of the project will be realized.

EIA Team

The EIA team is composed of several members, each have their own expertise. The team is composed of the following.

Xinglong Chen	Team Leader from China
Maria Carmela Q. Capule	Team Leader from Philippines
Yucai Bai	Marine Ecologist
Baojun Cui	Terrestrial Specialist
Yun Meng	Water Specialist
Li Hang	Noise Specialist
Xianzhe Li	Air Specialist
Ricardo A. Capule	Water, Air and Noise Specialist
Carolyn P. Barrias	Environmental Specialist
Bonifacio O. Pasion	Terrestrial Ecologist
Abelardo H. Angadol Jr	Terrestrial Specialist
Robert Pabiling	Marine water Ecologist
Milagrosa P. Asuncion	Sociologist

EIA Study Schedule

The EIA team undertook the following schedules from March to October 2019 as part of the preparation and conduct of the EIA process:

March 2019	Discussion of the project with DPWH- UPMO Office
	Review environmental regulations and standards implemented in the Philippines that cover the project
March – July 2019	Conduct survey, field investigation and site inspection of the project including the outlying areas to determine its biophysical conditions, i.e., land, air and water

	quality, noise environment, marine water ecology, socio-economic (perception survey etc.) land such as terrestrial flora and fauna, geological, etc.
	Conduct researches and gather data or information on the impact study area, i.e., geological, climatology, socio-economic aspects, past environmental conditions of the project.
June-July 2019	Preparation and submission of IEC to DENR-EMB Central Office
June – August 2019	Additional survey on terrestrial flora and fauna, groundwater quality, air and noise Report preparation
August 2019	Schedule of Public Scoping in affected Municipalities of Iloilo, Guimaras & Negros Occidental
September 2019	Submission of Public Scoping Report at DENR-EMB Central Office
	Schedule of Technical Scoping at DENR-EMB Central Office
October 2019	Presentation of draft EIS Report to DENR-EMB Schedule of 2nd Public Consultation/Presentation of Results
April 2021	Schedule of Public Hearing
May 2021	Submission of final EIS to DENR
May 2021	ECC Issuance

EIA Study Area

The EIA study area is at Municipality of Leganes, Iloilo, Municipalities of Buenavista and San Lorenzo, Guimaras and Municipality of Pulupandan, Negros Occidental in Region VI.

The study areas in general are the primary and secondary impact areas. The primary impacts areas of the project are the adjacent communities as shown below.

List of Municipalities affected by the PGN Project
Leganes, Iloilo
Municipality of Leganes
Barangay Gua-an
Buenavista, Guimaras
Municipality of Buenavista
Barangay Cansilayan
Barangay Banban
Barangay Navalas
Barangay San Miguel
Barangay Getulio
Barangay Dagsa-an
Barangay Salvacion
San Lorenzo, Guimaras
Municipality of San Lorenzo
Barangay M. Chavez
Pulupandan, Negros Island
Municipality of Pulupandan
Barangay Tapong
Barangay Canjusan
Barangay Pag Ayon
Barangay Zone 4A
Barangay Ubay

EIA Methodology

Different methods were used in collecting primary data from the field but utilized similar technique for secondary data collection. Tables below show the methods used for each field of study and the general methods for the EIA study.

Module	Coverage
Geology	Secondary data, Geological Mapping using GPS, Geologic Compass, and Topographic Map, secondary data
Hydrology	Delineation of streams and water shed boundaries using geological maps, Geographic location using GPS, water sampling and analysis
Meteorology	Secondary Data, maps, air quality measurement and analysis
Pedology (Soil quality)	Primary data
Terrestrial Biology	Primary data
Water Quality and Marine Ecology	Primary data
Air and Noise	Primary data
People	Primary data

Methods

General Methods for the EIA Study

Component	Methodology
Project Description	Meeting with DPWH and review of previous studies
Secondary Data and Relevant Environmental Laws	Research work: LGUs,NSO,PAGASA,EMB, DENR, NAMRIA, MGB Compilation of geohazard maps
Delineation of the Impact Areas	Annex 2-2 of RPM DAO 2003-30
Identification of the stakeholders	Annex 2-3 0f RPM DAO 2003-30
Description of the Existing Environment	EIS Scoping Checklist (Annex 2-7a of RPM DAO 2003-30) Secondary data collection Ocular inspection Terrestrial Flora and Fauna
Impact Identification	Modified impact identification checklist by Canter (1996)
Impact Assessment	Qualitative assessment Expert opinion
Environmental Management and Monitoring Plan	Impact Management Plan Template (Annex 2-17 of RPM DAO 2003-30) Template for Social Development Plan (Annex 2-18 of RPM DAO 2003-30) Template for IEC Plan (Annex 2-19 of RPM DAO 2003-30) Template for EMoP (Annex 2-20 of RPM DAO 2003-30)
Environmental Risk Assessment	Procedural Scoping Guidelines for ERA (Annex 2-7e of RPM DAO 2003-30)

Public Participation

Coordination meeting with different stakeholders like, DPWH, IPs, LGUs, and affected communities where conducted to discuss the project. Series of Public consultation were conducted on different date

to inform the affected communities and plan of action, perceive impact and recommended mitigation and compensation for affected communities.

Summary of Baseline Characterization, Key Environmental Impacts and Management and Monitoring Plan and EMF and EGF Commitments

Key Baseline Findings

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
LAND	
Land Use	The region has a total land area of 2,022,311 hectares or approximately 35.7 percent of the total land area of the Visayas and 6.7 percent of the Philippines. The Province of Negros Occidental is the biggest in terms of land area with 792,607 hectares which is almost 40% of the total area of the region. Iloilo comes second with 471,940 hectares or 23%: Capiz with 263,317 hectares or 13%: Antique with 252,201 hectares or 12%: Aklan with 181,789 hectares or 9% and Guimaras with 60,457 hectares or 3%. In Guimaras, Forest and Forestlands (FFL) cover 5,459.40 hectares and Alienable and Disposable lands cover 54,593 hectares, more or less.
Pedology	Grab sampling was used for soil quality measurement. Samples were collected on March 20 and 22, 2019 & July 6, 2019 at sunny weather. As of this time, Philippines does not have regulations on soils. Results of analyses are compared with Dutch Intervention Values for Environmental Assessment. Results are within the intervention values for arsenic, cadmium, copper, chromium, lead, mercury and zinc.
Topography	The islands of Guimaras and the surrounding islands are considered by the geologists to be land connected to Panay Island. Most of them are hilly terrain with an altitude of less than 200 meters, and the east coast is a strip-shaped lowland beach. The topography of Guimaras island varies from level to steeply sloping, with land elevation ranging from 0 to nearly 300 masl. Mt. Dinalman, located in Milan, Sibunag, has the highest elevation of 267 masl. Guimaras' topography shows quite steep slopes on the western side of island with plateaus and peaks above 200 m in the central portion. A large part or 69% of the total land area is within the 0-18% slope, 19.73% is above 18-30% slope, 9.42% is above 30-50% slope and 1.74 percent is above 50% slope. Based on the preliminary Karst subsidence susceptibility mapping of Mines and Geosciences Bureau (MGB), in the Municipality of Buenavista there are 89 sinkholes (all types) and 85 cave openings while there are 457 sinkholes (all types) and 282 cave openings in the Municipality of Jordan. The south bank of Iloilo Island in the northwestern end of the bridge area is relatively flat. It belongs to the landform of the Chonghai Plain. The elevation of the ground is less than 2.0m. The southeastern side of the island of Guimaras has an ups and downs, belonging to the hilly landform, the rushing sea plain and the piedmont plain. The elevation of the ground is generally between 0 and 90 m. The terrain of the middle cross-sea bridge is slightly lower. It belongs to the sea stall, the underwater shallow stall and the shallow sea accumulation plain. The ground elevation is at least -37m.
Regional Geology	The geotectonic structure of the study area belongs to the Philippine plate (II), with the Eurasian plate (I) on the southwest and the Philippine sea plate on the northeast (III). The Eurasian plate and the Philippine Sea plate subducted into the lower part of the Philippine plate, forming the Negros subduction zone in the west and the Philippine subduction zone in the east. The Philippine break across the Philippine plate divides the Philippine plate into two sub-structural

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
	units: the western plate of the Philippines (II1) and the eastern plate of the Philippines (II2). The area is one of the most active tectonic zones with frequent seismic activity. The epicentral distribution map of the earthquake clearly shows that the area is covered by shallow and deep earthquakes, and the subduction seismic zone controls the seismic distribution of the area. Most of the shallow earthquakes in the offshore are related to the shallow brittle subduction zone called the thrust fault (depth 0-60km). Most of the deep-seismic earthquakes occur in the deeper toughness of the subduction zone, known as the Benioff belt. According to the regional data and in combination with the geological survey of the project, it is shown that the poor geological phenomena found in the site of recommended scheme for bridge location on Section A of Panay-Guimaras Island mainly cover the karst, collapse and sandy soil liquefaction. The construction of project may be affected, and may have a certain impact on geology and geomorphology. The bank slope at landing point on both sides of the proposed bridge is gentle and stable, and there is little possibility of bank collapse in natural state. However, the rock and soil layer on the surface layer of is relatively loose, and the change of hydrological environment may lead to the stability of the bank slope under the long-term water flow, especially after the construction of the bridge. It is suggested that the revetment works should be increased at the bridge location during design and construction period.
Terrestrial	
Flora	A total of 122 species belonging to 111 Genus in 46 Families were recorded from the 21 flora survey sites. There were 87 species (80 Genus, 40 Family) identified from the eastern side of Guimaras island while 44 species (43 Genus, 25 Family) was recorded from the western side of the island. Negros Island has 33 species (33 Genus, 17 Family) while 17 species belonging to 16 Genus and 13 Families was recorded in the Panay island (Ilo-ilo). This result is not surprising, since more sampling plots was established along the Eastern Guimaras Island, while only two plots was established in the Panay Island. This unequal sampling distribution among islands was strategically chosen based from the length the proposed PGN project ROW for each island upon bridge landing. On additional survey of ten sites, a total of 82 species were identified across the study belonging to 32 families. Of these, the most speciose family was legumes (Fabaceae) with 10 species, followed by Euphorbiaceae and Moraceae both with 8 representative species, and then five species each for Lamiaceae, Malvaceae and Rubiaceae. Of the 32 families, 16 (50%) were represented by only one species (known as singletons), and six families were represented by only 2 species (known as doubletons). A total of 82 species were identified across the study belonging to 32 families. Of these, the most speciose family was legumes (Fabaceae) with 10 species, followed by Euphorbiaceae and Moraceae both with 8 representative species, and then five species each for Lamiaceae, Malvaceae and Rubiaceae. Of the 32 families, 16 (50%) were represented by only one species (known as singletons), and six families were represented by only 2 species (known as doubletons). There are also 40 exotic species recorded across the study, with most are unsurprisingly recorded in Plantations, Agricultural and Residential Landscape – which reflects that human active grounds are venue of more exotic species. Exotics species have the potential to be invasive such as

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
	hagonoi (*Chromolaena odorata*), aroma (*Acacia farnesiana*) and koronitas (*Lantana camara*). Other exotics recorded in this study are planted such as big leaf mahogany and yemane (Gmelina). On additional survey of 10 sites, majority of species were identified as indigenous species listing 58 out of 82 species (71%) recorded in the study area, while 10 species (12%) are known Philippine endemic and 14 species are (17%) are exotic or not native to the Philippines. A critical habitat that may be affected upon implementation of the PGN project construction are Mangrove forest. Mangroves constitute less than 1% of all forest areas worldwide, but they play an extremely important role in providing environmental services. As such, mangroves serve as an essential nursery for coastal and offshore fisheries, provide an array of timber and non-timber forest products to local communities, sequesters and store a large amount of carbon, which helps to mitigate the impacts of global climate change. More importantly, mangroves enhance sediment deposition and protect the coast from the destructive power of waves and storm surges. The world has seen a 50% decline in the total area of mangroves since the mid-twentieth century, making them one of the most threatened ecosystem.
Fauna	Survey of fauna composition of the project area was undertaken in three (3) consecutive days on March 16-18, 2019 and on June 2019. Weather condition during the survey is sunny. Survey on fauna composition of the project area covers the avi-fauna, mammals, and herpeto-fauna. Prior to the conduct of sampling, general habitat assessment was undertaken to consider different ecosystems and topography within the project area for the selection of areas for observation. A total of 22 observation sites was identified based on its significance and influence relative to the perceived presence of faunal species within the project area. Selected sampling sites represent different ecosystems in the area. Recorded fauna species during the entire duration of survey are dominated by birds. A total of 42 species of birds are recorded from the 22 observation sites with a total abundance of 568 birds. Recorded bird species belongs to the 26 avi-fauna families, which is dominated by Columbidae composed of 6 species. In terms of abundance, the Eurasian Tree Sparrow (*Passer montanus)* is the dominant species followed by the Asian Glossy Starlings (*Aplonis panayensis*) and Black-Winged Stilt (*Himantopus himantopus)* with a total abundance of 96, 65, and 48, respectively. Observation sites with the highest species diversity composition is site no. 22 comprised of 14 species out of the 42 observed. It is then followed by site nos. 5 and 20 with the species diversity of 13. Conversely, site 12, 14, 18 has the least species diversity with only 3 species observed. A total of 8 herpeto-fauna species are recorded in the area. There were 4 observed reptiles, namely, Gecko-gecko *(Gecko gecko),* Water Monitor Lizard (*Varanus salvator),* Bubuli/ Skink (*Eutropis multi-fasciata*), and Emerald Tree Skink (*Lamprolepis smaragdina)*. There was one (1) Emerald Tree Skink, and four (4) Brown Skink observed in different survey sites. Meanwhile, Gecko-gecko was heard during the sampling. Lastly, the Water Monitor Lizard is discerned from an ethnobiological interview with key informant. Only 2 species of mammals observed during the survey. There was the Polynesian Rat (*Rattus exulans)* and the Common Rousette Bat (*Rousettus amplexicaudatus).* Only 1 mammal was observed during the survey in additional 10 sites, which is believed to be the Common Dawn Bat (*Eonycteris spelae)* which are wandering along the mangrove area.

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
	Among the eight (8) herpeto-faunal species, the seven (7) species are under least concern in the IUCN category. Meanwhile, the Water Monitor Lizard (*Varanus salvator*) is under the least concern in the IUCN category, however, it is categorized as Vulnerable. On additional survey, distribution status of the six (6) recorded herpeto-fauna species showed that 5 are native, or non-endemic to the Philippines, and 1 is Philippine endemic (see Table 7 and Table 8). Among the six (6) herpeto-faunal species, five (5) species are under least concern in the IUCN. Continuous loss of faunal habitats due to degradation of forest cover brought by land clearing, conversion of remaining sites into settlements and other land uses. Though, faunal species are mobile in nature this situation will force them to migrate in other areas to search for new habitat. Migration of other wildlife to new territory/ies or ecosystem will pose threat to their existence. They can be further exposed to hunting, persecution and trading. Continuous destruction of faunal habitats and disturbance will threaten the remaining species population and survival in the near future if not prevented. Thence, decrease of population to some species in this area will be expected to happen while others may not significantly affect. Wildlife offer a variety of commercial values and open several livelihood sources, utilization is not regulated as to case of illegal poaching and hunting and over collection. Though conservation actions are currently being made, illegal activities still continuously happen. The scenario puts wildlife population at risk of being threatened and has the probability of getting extinct if left unresolved.
WATER	
Oceanography	During dry season, the discriminant number of tidal current type on each level of C7 station is more than 0.5 and less than 2, which is irregular semidiurnal tidal current, and the discriminant number of tidal current type on each level of other stations is less than 0.5, which is the regular semidiurnal tidal current. During wet period, the discriminant number of tidal current type at the partial level of C6, C7, C8 and C9 stations is more than 0.5 and less than 2, which is irregular semidiurnal tidal current, accounting for 27% of statistical discriminant number of tidal current type; the discriminant number of tidal current type at each level of other stations is all less than 0.5, which is the regular semidiurnal tidal current. To sum up, the engineering sea area is the sea area dominated by the regular semidiurnal tidal current. The ocean current of the whole strait along the strait channel (or bank line) is mainly dominated by reciprocating flow, which is roughly northeast-southwest direction. Specific features are as follows: Observation Stations on northern section (C1): During dry season, the flow velocity of ocean current for high and medium tide is all higher, and the main direction of ocean current is NE-SW, which shows obvious characteristics of the reciprocating flow. The velocity of low tide is very low, and the ocean current mainly changes in the SW-dominated fan-shaped range, which shows the characteristics of rotating flow. During wet season, the flow velocity of ocean current during three tidal periods is all not high, and the main direction is dominated by reciprocating current, and the main direction is NNE-SSW. In the observation of high, medium and low tide periods during wet season and dry season, the maximum of flow velocity for ocean current in most stations appears on the surface layer or the 0.2H layer, and the flow velocity gradually decreases from the surface to the bottom, but the variation is less, and the distribution of flow direction on the vertical line is relatively consistent.

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
	During dry season, the duration of rising tide current for each station is 4.00~7.50 hours, and the duration of rising tide current for each station is 4.50 ~ 7.25 hours, the duration of rising tide current for C7, C8 and C9 stations is more than that of falling tide current, and the duration of rising tide current for other stations is less than that of falling tide current. During the medium tide period, the duration of rising tide current is 4.25 ~ 7.75 hours, the duration of falling tide current is 4.50 ~ 7.75 hours, the duration of rising tide current for C8 station is more than that of failing tide current, and the duration of rising tide current for other stations is less than that of falling tide current; During the low tide period, the duration of rising tide current is between 3.25-5.50 hours, the duration of falling tide current is between 6.25-8.50 hours, the duration of falling tide current for all stations is more than that of rising tide current. During high tide period, the duration of rising tide currenton each level of each station is between 5.00～6.00 hours, while the duration of falling tide current is between 6.00～7.50 hours. During the medium tide period, the duration of rising tide current on each level of each station is between 3.25～6.00 hours, while the duration of falling tide current is between 6.00～7.50 hours. During low tide period, the duration of rising tide current on each level of each station is between 5.00～7.50 hours, while the duration of falling tide current is between 7.00～8.00 hours. During high, medium and low tide periods, the duration of rising tide current for all stations is all less than that of falling tide current.
Fresh water	The main rivers on A section for PGN project are the Iloilo River, Tigum River and Jalaur River on Panay Island. The Iloilo River originates from the Batino River in Oton, flows through the Lapuz, Lapaz, Manduriao, Molo, Arevalo and Iloilo urban area and infuses into the Iloilo Strait. The water level fluctuates with the tides due to closing the estuary. Section A of PGN Project mainly refers to small seasonal rivers on Guimaras Island, while Section B of Project PGN refers to main river such as San Lorenzo River on Guimaras Island.The main river of PGN Project on Section B is the Bago River on Negros Island. Sulu Sea is located to the southwest of PGN Bridge, and Visayas Sea is located to the northeast. The islands and reefs distribute horizontally and vertically around Visaya Sea and Sulu Sea, the topography fluctuates sharply, the local wave conditions are complex, and the waves are complicated in the whole engineering area due to influence by topography.
Fresh Water Quality	Grab sampling was used for marine water quality measurement. Samples were collected on March 20 and 22, 2019 with fair to sunny weather. Total of 8 stations were sampled at low and high tide. Based on the results, pH, color, Dissolved Oxygen (DO), TSS, oil and grease, nitrate, phosphate, metals and fecal coliform bacteria meet the criteria guidelines of the DENR Administrative Order (DAO) No. 2016-08, Water Quality Guidelines and General Effluent Standards of 2016 for Class SC limits. It should be noted that DENR does not have regulatory standard for BOD, COD, chloride under class SC. Increased turbidity and suspended solids in marine water is one of the adverse impacts anticipated during the bridge pier foundation construction. These impacts will be short term and limited to the vicinity of the project site. The magnitude of suspended matter increase and impact scope is directly related to construction method. In the comparison and selection scheme of bridge pier foundation for this project, the caisson foundation scheme having great disturbance to seabed was abandoned, and the pile group foundation scheme was selected. More specifically, integral steel casing scheme was adopted for construction of main bridge foundation, and the steel trestle and steel casing

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
	scheme was adopted for construction of approach bridge foundation. Therefore, the significant disturbance on seabed during bridge pier construction will be felt mainly during the steel trestle construction stage and during installation of steel casing. The impact of bridge foundation construction on marine water quality is short term and is expected to be limited to the project site.
Groundwater Quality	Grab sampling was used for marine water quality measurement. Samples were collected on March 20 and 22, 2019 with sunny weather. All parameters measured are within the Philippine National Standards for Drinking Water (PNSDW) Administrative Order No. 10, Series of 2017 (DAO 2017-010) except for chloride in station 1 and station 6, color in stations 1,4 & 6. Fecal coliform bacteria in all groundwater stations failed to meet the drinking water standard. There should have no presence of fecal coliform bacteria in a water sample. Possible high concentration of chloride is salt water intrusion in the shallow wells. Total coliform is a measure of potential water contamination from bacteria that can be found in soil, vegetation and feces of warm-blooded animals. Most coliform bacteria are generally harmless but they may also pose some health risk if there is presence of fecal coliform. Fecal coliforms are associated with human or animal wastes. Factors of bacteria contamination are pre-mature to conclude unless successive monitoring will be done to say that water supply is contaminated with bacteria. There are no present drinking water guidelines for BOD, COD, dissolved oxygen, Surfactants, TSS, oil and grease, phosphate and hexavalent chromium. Though potential impacts from drilling are confined to marine environment, there is the possibility for ground water contamination due to mishandling and mismanagement of equipment, particularly in the work sites. During the constructional phase oil, paint or other chemicals will need to be handled properly. Mishandling of fuel has led to serious pollution of soil and groundwater. There have also been reports of spilled oil near temporary generator sets and around fuel transport lines in other similar projects. This sort of pollution may sometimes have long-term irreversible effects, extending through the operations stage, since such contamination does not degrade itself and is expensive to clean up. The clean-up itself may require extensive ground water extraction, which will impacts such as salt-water intrusion.
Marine Ecology	To establish baseline data on coastal resources, an assessment was carried out last 15 to 18 March 2019 to determine the current ecological conditions of submerged coastal habitats that may be impacted by the proposed construction of bridge project across the three main islands. A total of 22 sites were assessed during the conduct of seagrass assessment on the same period with that of coral reefs. Out of these sites, seven (7) were from barangays Nabitasan and Gua-an in the municipality of Leganes, province of Iloilo (Panay island); six (6) were in Getulio, Buenavista and four (4) in Cabano, San Lorenzo, both are located in Guimaras island; and five (5) in Poblacion, Pulupandan in Negros Occidental. Detailed coral reef assessment was conducted using the Photo-transect method (Vergara and Licuanan, 2007). Aside from facilitating the conduct of the survey and providing a permanent record of benthic cover, the photo-transect method is also accurate in detecting changes on the reef through time (Leujak and Ormond, 2007). Fish Visual Census (FVC) technique (English, *et al.*, 1997) was used to determine the species diversity, abundance and biomass in the different sites surveyed. This procedure was done on the same transect laid for the coral survey. After the

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
	line had been laid, observers waited for about 5-10 minutes before the actual census to allow for the disturbed fish community to return to their normal behavior. Starting at one end of the line, all fishes within a 5m x 10m imaginary quadrat were identified up to species level (if possible) and their numbers and estimated sizes recorded. Observer swam to and briefly stop at every 5-m mark along the line until the transect line was completed. The faster moving fishes were counted first before the slower ones. Each transect covers an area of $500m^2$ (50m long x 10m width). A total of eight (8) sampling stations were conducted to assess the plankton abundance, diversity and richness last March 15-16, 2019. Vertical samples were taken at each station by hauling 25-cm mouth diameter conical plankton with 20 microns mesh size for phytoplankton. For zooplankton samples, a 60 microns mesh size was used. No seagrass and live coral were recorded across the seven (7) stations surveyed along barangays Nabitasan and Gua-an in the municipality of Leganes, province of Iloilo. The bottom substrate was generally muddy in Leganes, Iloilo. This geomorphological setting of the area contributed to the low visibility and high turbidity. Moreover, siltation and possibly eutrophication may promote plankton bloom, which in the process may cover the seagrasses and reef bottom to hinder further recruitment and settlement. The same pattern (no seagrass and corals) was observed in coastal areas across the various sampling sites in barangay Getulio, Buenavista in Guimaras Island. Aquaculture practices such as fish ponds also contributed to water turbidity aside from the area as a major route of fast craft along Iloilo Strait going back and forth to Iloilo and Guimaras. Silt was the limiting factor for coral recruitment aside from less hard substrate availability. Meanwhile, light and availability of suitable substrate may limit seagrass recruitment and establishment considering that the area was quite turbid and had hard substratum, which can be influenced by the presence of coralline cliff area at the coast. Among the four sites sampled in barangay Cabano, San Lorenzo in Guimaras Island, the northernmost site was confirmed to harbour seagrass *Cymodocea serrulata.* These seagrasses can be found about 150-200 m from the concrete municipal wharf and about 100 m from the shore facing a windmill. On top of *C. serrulata*, there were seaweeds present under the genus *Padina* and *Halimeda.* None of hard coral was observed across the five (5) sites surveyed in San Lorenzo, Guimaras. Based on the anecdotal account, locals observed live coral in shoal reef. However, the boat captain could not pin point the exact location of the shoals during the surveys. Hence, we did aspot dive along the coast considering that San Lorenzo reef was clearer compared to other sites. And yet, the area still had low visibility due to strong waves. All stations were sandy-muddy bottom where coral recruits are impossible to grow. Hard substrates were not observed during the dive except rocks near the coast. Those rocks were not sampled due to strong waves. No reefs and seagrasses were encountered from six (6) sampling areas in Pulupandan, Negros Occidental. Deep soft mud was observed in all spot dives in relatively deep areas. In addition, loose grayish sediment or volcanic origin along the coasts, which indicate unsuitability of sediment substrate for establishment. There were also a river system, Bago River, and major coastal development in the area that may seem to contribute to siltation and water visibility, hence deteriorating water quality for photosynthetic organisms like seagrasses and corals. Furthermore, silt and plankton bloom, if they settle at bottom, may cover the reef substratum for colonization, hence impossible for coral recruits to settle.

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
	None of the reef fish species were seen during the survey across the four sites. With the present reef condition, it is uncertain if there are still sites across the islands that harboured reef fish species. Some soft bottom fish species that can thrive in silted environment like in these areas are probably *bisugo* (thread brims) and *bagaong* (Teraponidae), mullet/gisaw (Mugilidae), (Siganidae) rabbitfish/danggit and barramundi/salungsong (Latidae), crab/alimasag (Portunidae), ponyfish/sap-sap (Leiognathidae). The *Acetes* or hipon are among the marine species along the Iloilo-Guimaras Channel were observed in seasonal pattern from September to October (Panay Power 2018). As part of the marine ecology study for the Panay-Guimaras-Bridge (PGN) Project, a water sampling covering eight stations was conducted to assess the plankton abundance, diversity and richness was conducted last March 15-16, 2019. A total of 30 phytoplankton species were identified across in all sampling stations. These identified taxa belonged to three major groups, *i.e.* diatoms, dinoflagellates and cyanobacteria. Overall, diatoms dominated the phytoplankton community accounting for almost 88.12%, followed by cyanobacteria with 11.09% and dinoflagellates with less than 1%.The top five most abundant phytoplankton taxa. Analysis of samples taken from the eight stations revealed a total of 17 zooplankton groups (adult and larval forms). Zooplankton observed during this sampling was typical groups/type found in marine environment. The top 5 dominant zooplankton were copepod nauplius (53%), adult copepods (29%), bivalve veligers (19%), copepod eggs (14%), larvacean (1%) and the remaining 2% was attributed to gastropod veliger, polychaete trocophore, cladoceran, decapod zoea, echinoderm larvae, crab zoea, fish larvae, mysids, and radiolarian (**Figure 90**). Zooplankton communities' analyzed were mostly represented by larval forms constituting for 70%while adult forms accounted for 30% of the total zooplankton community. The bulk of the larval forms were composed of copepod nauplius accounting for 53% and total density of 1.3 x 10^6individuals/m^3. Since coral reefs were hardly seen in all site surveyed while seagrasses were only reported in Cabano, San Lorenzo, Guimaras, the impact of the project on marine ecology along the project sites may be minimal in the sense that corals and seagrasses did not exist virtually in all sampling sites, with an exception in San Lorenzo sampling sites. The construction of bridge foundations could be on hard substrates and literally concrete material in nature, these foundations may hinder water circulation and longshore current, hence minimizing sediment and water mass exchanges. Therefore, it is recommended the engineering design of bridge (e.g., stockpiles) may consider these hydrodynamic processes in such a way not to dampen incoming and outgoing tides and currents. Sediment resuspension will negatively affect habitat quality. The presence of temporary structures will likely change water movement and fish migration in the area. Vibrations associated with operating large machinery might lead to mortality among certain fish especially the juveniles. Hence, mitigation measures should be implemented as soon as the work begins. The free circulation of water must be ensured to maintain fish habitat functions (feeding, nursery, spawning) downstream from the work area. Any debris or concrete waste must be properly disposed of. All debris accidentally introduced into the aquatic environment must be removed as quickly as possible.

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
AIR	
Climate	The climate map of the country is based on the Modified Coronas classification. The project area under study belongs to Type I category. This is characterized by two pronounced seasons; dry from December to April and wet during the rest of the year. The climate is tropical in Iloilo City. Most months of the year are marked by significant rainfall. The short dry season has little impact.
Rainfall	The southwest monsoon is the main rainfall-causing weather system of the area. Tropical cyclones seldom, if not rarely, cross the project area. The rainy season in the area occurs from May to November while the rest of the year is relatively dry. The month of July is the wettest, with a monthly average rainfall of 329.6 mm. The month of February, on the other hand is the driest, with a mean monthly rainfall of 16.0 mm. The average annual rainfall recorded based on 30 years of data is 1767mm. Rainfall in Guimaras during the northeast monsoon would most probably be due to conventional thunderstorms, a result of intense heating causing rapid evaporation, or to a lesser extent, typhoons which can occur in the region during October-November. The probability of a typhoon hitting Guimaras is fortunately low. The island has a rare frequency passage of 0% - 10% of the annual average of 19.8 typhoons. Precipitation in Iloilo averages 2083 mm.The driest month is February. There is 27 mm of precipitation in February. The greatest amount of precipitation occurs in August, with an average of 346 mm. The precipitation varies 319 mm between the driest month and the wettest month.
Temperature	With an average of 28.5 °C, May is the warmest month. The lowest average temperatures in the year occur in January, when it is around 25.8 °C. The variation in temperatures throughout the year is 2.7 °C. In Iloilo City, the average annual temperature is 27.1 °C.
PAGASA 2020-2050 projection	Hot days and dry days are likely to be more frequent over the Philippines with more heavy rainfall days especially over Luzon and Visayas by 2020 and 2050. Reduction in rainfall in most parts of the Philippines is predicted during the summer (MAM) season. However rainfall increase is a trend during the southwest monsoon (JJA) until the transition (SON) season in most areas of Luzon and Visayas in 2020 and 2050. Heavy daily rainfall will continue to become more frequent, and extreme rainfall is projected to increase in Luzon and Visayas only. But number of dry days is expected to increase in all parts of the country in 2020 and 2050.
Ambient Air Quality	Air Samples were collected on April 2-4 & July 8-9 in Buenavista, April 6-8, 2019 in San Lorenzo, Guimaras. In Iloilo, samples were collected on April 12-13 in Leganes and July 6-7, 2019 in Jaro. In Pulupandan, Negros Occidental, air samples were collected on April 9-11, 2019. Total of 9 stations were sampled. Weather conditions at the time of sampling were sunny, fair to cloudy with slight rains. Twenty-four (24) hours measurement were sampled for Total Suspended Particulates, PM10, Nitrogen Dioxide, Sulfur Dioxide and Carbon Monoxide. Results of air quality for all parameters measured at two (2) sites are compared with National Ambient Air Quality Guideline Values (NAAQGV) of Republic Act 8749 or known as Philippine Clean Air Act. All parameters tested in all sites are within the allowable limits. Pollution from the project are mainly air-borne dusts, generated from activities such as road construction, pipeline construction, and vehicle operations. The effect of pollution will be high on buildings close to the project site. Use of

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
	commercial asphalt is recommended in the construction, because its exhaust gas will have less impact. In the demolition and relocation on earlier stage, the air-borne dust from demolition and relocation may occur in the process of pushing, knocking and clearing transportation. The demolition of the project on earlier stage mainly involves the houses along the line. Therefore, in the process of demolition, it is necessary to strengthen the management, standardize the construction and adopt necessary ambient protection measures such as sprinkling water in order to reduce the air-borne dust impact on the periphery. Bridge construction mainly includes the construction of the foundation, bridge superstructure, lifting and splicing stage. In comparison to the air born dust resulting from the pavement construction, the impact of air-borne dust caused by bridge construction is relatively small. This is because, it neither involves the construction of a new pavement nor produces secondary air borne dust from driving on unfinished pavements.
Ambient Noise	Noise measurements were collected on April 2 to 11, 2019 & July 6-9, 2019 at Municipalities of Leganes, Iloilo, Buenavista, San Lorenzo, Guimaras and Pulupandan, Negros Occidental. Weather condition at the time of sampling was sunny to cloudy with slight rains. Twenty-four (24) hours measurement were sampled for Noise level. on the results of noise measurement, some areas failed to meet the standard limit set fort. However most of the said exceedances are not critical since high noise level created during sampling are mostly intermittent only specifically those coming from animals like barking of dogs, rooster crowing, etc. Noise sources of the planned project in the construction stage mainly come from construction machinery, supplemented by radiation noise of transport vehicles. Specific construction machinery used in the project and their distribution are drilling machine: this project adopts bored pile construction. Lifting machine, concrete mixer and concrete vibrator, asphalt paver, electric drill, electric saw, and cutting machine and so on are manly applied in pavement construction and traffic engineering construction, with comparatively less impact. Other sources are rollers, bulldozers, excavators, and pneumatic picks and so on which are mainly used in the construction of roads and dump trucks are mainly employed in the construction sites, to transport building material to construction site and convey construction wastes and project dredge to the designated locations. Significant noise and vibration impacts are anticipated during the construction of ground roads and bridge engineering.
PEOPLE	
Population	The located is located in one (1) Municipality in Iloilo, two (2) Municipalities in Guimaras and one (1) Municipality in Negros Occidental covering a total of 12 barangays. The total population of the 12 barangays are 19,097. Among the barangays cover, M. Chavez in the municipality of San Lorenzo, Guimaras and Getulio in the municipality of Buenavista, Guimaras have the highest population with 2,803 and 2,619, respectively. On the other hand, the least population within the project area is Barangay Pag-ayon with 981 populations. Based on 2015 Census of Population and Housing of Philippine Statistics Office, the four (4) municipalities have a total population of 136,764 and an average population density of 717.5 persons/km2. The highest average population density among the municipalities covered is Pulupandan in Negros Occidental with 1,200 persons/km^2.

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
Religious Affiliation	Majority of the population in Iloilo belongs to Roman Catholic comprising about 44% of the total population followed by Aglipay with only 2%(PSA 2015), while the remaining are composed of different religious sector with less than 1% in population. In Guimaras Island, 37% are Roman Catholic, 7% are Aglipay and 1% are Baptist. Likewise, religious sector in Negros Occidental are dominated by Roman Catholic with population comprised of 88% while the remaining percentage belongs to different religious sectors such as Aglipay, Born Again, Buddhist, Baptist, among others.
Ethnicity	The Ati, a Negrito ethnic group, are mostly found in Western and Central Visayas. Large concentrations are found in Aklan, Capiz, Antique, and Iloilo on Panay Island, and the biggest group is in Iloilo. There are also Ati populations on the islands of Guimaras and Negros (comprising Negros Occidental and Negros Oriental). Few Atis still speak their traditional language, as it has been replaced by Kinary-a, which is spoken in Antique and some parts of Iloilo. Moreover, there is no IP Groups nor CADT/CADC within the proposed bridge alignment that may be affected nor displaced
Education	In terms of literacy, age group from 10-14 and 15-19 has the highest population recorded in all municipalities affected while the least in terms of population are those age group of 60-64. Highest literacy in the data of PSA (2015) is in the municipality of Buenavista, Guimaras with 41,122 populations.
Water Supply	Leganes' sources of Level III potable water are the deep wells in the barangays of Guihaman and Cagamutan Sur. The municipality has adequate underground water supply, which can be tapped for domestic and commercial uses. The surface water in Calaboa Creek, Carismo-an Creek and Janipaan River are utilized for irrigation purposes. Water supply of Municipality of Buenavista come from their Municipal water district and served to 4,397 households. Some people in the community their water supplied by wells/spring in the brgy., Water supplied through water faucets in individual households. Municipality of Pulupandan get their water supply in Water System of Pulupandan. Water system was previously managed by the Municipality of Pulupandan. The water system consists of a 100 CU.M. Concrete Reservoir, Kilometers of pipelines consisting of combination of Galvanized iron and PBC pipes of varying sizes.
Power Supply	Electric supply of Municipality of Buenavista and San Lorenzo come from Guimaras Electric Cooperative (Guimelco). While municipality of Leganes and Pulupandan get their power supply in Negros Occidental Electric Cooperative (Noceco), catering to consumers in the southern portion of the province, from Pulupandan to Hinoba-an.
Transportation and Road Network	Leganes is only about eleven kilometers from Iloilo City and few kilometers from the Iloilo Airport of International Standards. It can be reached from Iloilo City through the National Highway to the north or the Coastal Highway to the Municipality of Dumangas. The Coastal Road serves as the shorter link of the town to the International Port in Barrio Obrero, Lapuz, Iloilo City and to some of the municipalities in the north. There are also barangay roads that connect the municipality to the adjacent towns like Sta. Barbara and Pavia. Buenavista and Guimaras can be reach by boat if you are coming outside the province. Jeepney, tricycle and motor are the main transportation in the area while in Pulupandan, Negross Occidental can be reach by bus when coming

COMPONENTS/ SUBCOMPONENTS	KEY BASELINE FINDINGS
	from other municipalities and provinces. Nearest airport to the area is in Bacolod City.
Peace and Order	In terms of peace and order in the four (4) municipalities affected by the project, through the joint effort of the police, fire department and the community, is considered as one of the most peaceful municipalities of the Province of based on the low crime rate recorded. No heinous or sensational cases have ever been recorded and there are no existing criminal groups in the area for several years. The police, fire department and the community are doing its part in keeping with the said status purposely to attract more investors to do business in the area and maintain a peaceful and ideal place to live, work and conduct business.
Gender and Children Rights	There is a gender and development in the four (4) municipalities affected by the project. They implemented the equal protection or treatment to women. Part of their gender and development initiatives is the implementation of GAD-ECCD Program which consider gender welfare as well as early childhood care and development.
LGU Income	In terms of IRA dependency, there are increase and decrease in dependency among all the municipalities within the project area. In San Lorenzo, Guimaras, from 97% IRA dependency in 2009, it decreased to 82% in 2016. On the other hand, there is an increasing trend of IRA dependency in Pulupandan, Negros Occidental while Buenavista, Guimara is consistent with 88% to 90% between 2009-2016. Leganes, Iloilo has the lowest record of IRA Dependency in 2010 with 69% while the highest was in 2013 with 81%.(Data source: Bureau of Local Government Finance, Department of Finance, 2017).
Public Participation	Public Scoping meetings were conducted with stakeholders last August 27-29, 2019 at the four (4) affected Municipalities: Municipality of Pulupandan in Negros Occidental, Municipality of Buenavista and San Lorenzo in Guimaras and Municipality of Leganes in Iloilo. The stakeholders are composed of LGU Officials, barangay councils, community leaders and representative from People's Organization and Government Agencies. On people, most of the issues and concerns raised were the road right of way (RROW) which include the families, properties, structures, land (agriculture, trees) that will be affected by the alignment and just compensation. Impact on livelihood to fishermen, prioritization of job opportunities to local communities

Summary of Key Issues and Concerns Raised during Public Scoping and how these are addressed by the Project

Environmental Component Likely to be Affected	EIA Module	Issues/Suggestions raised by the Stakeholders	Sector or Representative who raised the issues/suggestions	Issues addressed by the project and proponent
Municipality of Pulupandan, Negros Occidental				
Land	Terrestrial Flora (Mangrove)	Mangroves that may possibly affected by the project	Mr. Jimwell Canedo, Brgy. Pag-Ayon	The areas with mangroves traversed and affected by the alignments were included in the study. DENR has guidelines regarding the affected mangroves which the proponent will comply.
Water	Water Resources	Source of water maybe affected during the construction	Ms. Mila Lourdes Tandoy, Municipal Sanitary Inspector	If the source of water for drinking is coming from the shallow well, it will be affected, as well as the pipe lines. The contractor must be responsible in keeping the source of water safe and clean. It is recommend that people in the community should be part in close monitoring during the construction to mitigate the loss of the water. For the disposal, it will be included in recommendation on proper disposal of waste during and after the construction.
People	Institutional	Role of LGU in the project	Barangay Captain Marina Amacio of Brgy. Pag-Ayon	The role of the LGU in this project is very significant. The contractor shall have close coordination with the LGU and the affected people before and during the construction of the project. We will include in the study the social development project but it depends to the DPWH if this will included on their plan.
People	Delivery of Materials	-Process during the construction in terms of delivery of the construction materials and safety considerations	Ms. Josenel Joy Salinas, Municipal Social Welfare Officer	Same road will be used during the delivery of the construction materials. The possible effects are the dust and

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		-Other route or alternative road for the delivery vehicle for the materials to create less traffic and disturbance in the community		noise pollution during construction. Appropriate mitigating and management measures will be ensured and recommended in the study. Municipal Social Welfare officer suggested to provide alternative route of the road during the delivery of the construction materials at Singko Onse.
People	Project Affected	Issue on affected structures, houses, land and trees that will traverse by the alignment	Ms. Virginia Cordeno, Brgy. Kgwd. Brgy. Zone 4A	The affected property or land will be compensated by DPWH with fair market value. The Resettlement Action Plan team will be responsible in making an inventory of all affected concerns such as crops, houses and properties based on DPWH guidelines.
People	Livelihood	Concern on livelihood of fishermen during construction. Issues on marine fauna such as fishes and security and safety measures	Ms. Mary Jane Odelmo, Brgy. Kgwd. Brgy. Tapong	The DPWH, as the project proponent should coordinate with the contractors and ensure that safety guidelines and provisions are in place. During construction, it is expected to experience disturbance among fishermen in which the contractors should manage and ensure mitigation measures are in place. Residents are encouraged to have active involvement on environmental problems that will arise when construction begins. On the other hand, this project is very helpful for the development in the community particularly accessibility.

Environmental Component Likely to be Affected	EIA Module	Issues/Suggestions raised by the Stakeholders	Sector or Representative who raised the issues/suggestions	Issues addressed by the project and proponent
		Chance of job opportunity once project implementation takes place	Barangay Captain Marina Amacio of Brgy. Pag-Ayon	Absolutely yes! Numerous incomes generating jobs will rise.
Others	Project Details	No of lanes for bridge construction and location of alignment of the bridge	Mr. Eduardo Moreno, Brgy. Kgwd. Brgy. Pag-Ayon	For now, there will be only 2 lanes with emergency bay, this is not final and will be subject for DPWH's approval. There are proposed alternatives and best alignment as presented in consultation meeting
		Target or timeline of the project Also, can we suggest to include the bike lane?	Barangay Captain Marina Amacio of Brgy. Pag-Ayon	Tentative in 2022 as the proposed implementation of the construction of the project or after the approved detailed engineering design. Six years is the timeline for the construction of the project. 2028 is the target to operate the bridge. Inclusion of bike lane in the design is noted.
Others	ECC	Who will apply for the ECC?	Mr. Jimwell Canedo, Brgy. Pag-Ayon	DPWH/ consultant is responsible for the application of ECC to DENR-EMB.
Others	Expression of Support	Ms. Yryne Valenzuela, P.I.O/Executive Assistant "We are thankful to government because they give us a chance to have this project here in our community. We say "Yes" and gave a "thumbs up" for this project. Because of this project, there are lots of possibility on the promotions of tourist spots here in Pulupandan. We are hoping that this project will be implemented. Let us support this project. LGU will always support on projects that will provide welfare to the people in Pulupandan".		
		Barangay Captain Marina Amacio of Brgy. Pag-Ayon "We don't have any problem with the proposed project. I fully support and have no objections to the proposed bridge project. We hope that the project will be fast track. The proposed alignment has less people and structures that will be affected. In behalf of Brgy. Pag-ayon community, you have our full support".		

Environmental Component Likely to be Affected	EIA Module	Issues/Suggestions raised by the Stakeholders	Sector or Representative who raised the issues/suggestions	Issues addressed by the project and proponent
Municipality of Buenavista, Guimaras				
Land	Terrestrial Flora and Fauna	Concern on trees if included in the affected areas since there were lots of trees, crops and kalamansi	Ms. Girlie Magilo, Municipal Agri-Fisheries Council	Trees were included in the study. Details of inventory will be included in the Resettlement Action Plan (RAP).
People	Project Affected	Concern on affected land properties that will be traversed by the alignment	Mr. Eliodoro Millama, Brgy. Kgwd. Brgy. Cansilayan	The affected property or land will be compensated based on DPWH guidelines. Inventory and assessment will be based on Resettlement Action Plan Survey.
People	Livelihood (Fisherfolk)	Based on experience, the construction of the wind turbines greatly affected our crops. Issue on the displacement of fisher folks and natural resources once construction takes place	Ms. Girlie Magilo, Municipal Agri-Fisheries Council	Marine ecology on flora and fauna, present conditions of marine life, its impact to biodiversity will be included in the study. Mitigation and preventive measures are recommended in the report including strick implementation and compliance. Social programs are proposed that will most likely affect the livelihood of the fishermen.
People	Livelihood (Mango Plantation)	Concern on protection of mango industry in the area from outside mango traders since Guimaras is known for its abundant production of mango fruits	**Ms. Girlie Magilo, Municipal Agri-Fisheries Council** There is a quarantine area before entering the island and check point. It is already a national law that mango fruits of outside traders are prohibited from entering the island. It will be assured that strict implementation takes place. **Mayor Eugenio Reyes, Municipal Mayor of Buenavista** Putting up an inspection/check-point in the project area to monitor the entering of goods to prevent outside traders from entering the island.	
Others	Project Design	Concern is on engineering and technical design of the proposed bridge, especially bike and motorcycle lanes and pedestrian lane to which people could walk though	Mayor Eugenio Reyes, Municipal Mayor of Buenavista	The proponent will be informed on the final design of the bridge and the suggestion on possible inclusion of bike lane and motorcycle lane in the design.
Others	Expression of Support	**Mayor Eugenio Reyes, Municipal Mayor of Buenavista** "We are very thankful for the government in particular for this project in our municipality. It will boost our economic development and it will also attract tourists and investors in our community. This project is very helpful to us because most of the passengers are stranded every time there is strong typhoon which hinders us to cross the sea going to nearby provinces due to no other means of transportations. Also, if this project will be realized, we hope that the next		

Environmental Component Likely to be Affected	EIA Module	Issues/Suggestions raised by the Stakeholders	Sector or Representative who raised the issues/suggestions	Issues addressed by the project and proponent
		project will be airport in our municipality. We are requesting to the proponent for the close coordination to the LGU before and during the construction of the project for their information and mostly for the displacement of the affected people. Right now the LGU still updating their CLUP".		
Municipality of San Lorenzo, Guimaras				
Land	Mangroves	Issue on mangroves and timberland	Ms. Catherine Ann Gawara, Municipal Planning and Development Coordinator (MPDC)	The areas with mangroves that will be traversed and affected by the alignment will be assessed and included in the study.
People	Project Affected	Concern on affected houses by the project and proper coordination and meeting in the community	Ms. Chona Tabiano, Brgy. Kgwd. Brgy. M. Chavez	The affected houses, property or land will be compensated based on DPWH guidelines. Inventory and assessment will be based on Resettlement Action Plan Survey**.**
		Requesting for the consideration to re-route the proposed alignment since our house will be affected; traverses some buildings like barangay hall, day care and houses.	Mr. Rafael Tabiano/Ms. Chona Tabiano, Brgy. Kgwd. Brgy. M. Chavez	Suggestion is noted. DPWH has guidelines for compensation for the affected people. 2021 is the propose schedule for the settlement to the affected residents in the project. The LGU or the affected barangay will provide or submit the certificate for no objection of the project. One consideration of the recommended alignment is based on the distance of the windmill and safety of the people.
		Concern on relocation of the affected people. LGU has no allocated fund or budget for their relocation or resettlement.	Ms. Catherine Ann Gawara, Municipal Planning and Development Coordinator (MPDC)	This issue will be raised t to DPWH if they can provide
People	Public Consultation	The recommended alignment will traverse a fishpond area. There should have a public hearing to be conducted in the affected barangay	Ms. Catherine Ann Gawara, Municipal Planning and Development Coordinator (MPDC)	Resettlement Action Plan survey will be done once the alignment is final. This is actually a detailed study to evaluate and account all the properties that will be affected by the road alignment. Definitely, there will be public hearing. It is important for us to know all your concerns regarding the environmental impact of the project.
		Suggestion on next consultation meeting that more attendees from	Ms. Catherine Ann Gawara, Municipal Planning and Development Coordinator (MPDC)	Invitations were sent to target participants such as Regional DENR and other non-government organizations for the consultation meeting but bad

		other government agencies and specialists will attend		weather, some attendees were not able to make it. For the next consultation, it will be ensured their attendance to the meeting.
People	Social Acceptability	What will happen if the involved barangay will go against the alignment?	Ms. Chona Tabiano, Brgy. Kgwd. Brgy. M. Chavez	It is advised that the barangay has to submit a letter of disagreement with road alignment. The final decision will be based on evaluation of the Environmental Management Bureau (EMB) to grant the ECC or not.
Others	Project Design	Where is the approach of the bridge in the M. Chavez? -Suggest rerouting of vehicles before and during construction to prevent accidents in the area -Query on length of bridge -Consideration on earthquake Design -width of bridge -Cost of project	SFOI Charlie Nieles, OIC-Bureau of Fire and Protection	The proposed map of the approach bridge was shown to the stakeholders through the aid of Google earth. Suggestion will be raised to the proponent for consideration. Based on the recommended length it is around 13.10 meters. Yes, earthquake design is accounted Two lanes will be proposed with estimate width of 3.5 to 4 meters Based on the estimated cost of the bridge project it is around 27 Billion. This is not the final cost and depends on the agreement from Philippine Government and Government of China
		Actual plan of the bridge is requested	Mr. Ibany Bonilla, Municipal Administrator	This issue will be raised to the proponent to provide the final plan or design for approval of the municipality.
		Consideration on pedestrian lane to walk or jog along the bridge.	Ms. Susie Ferrer, Brgy. Cabano	The proposed bridge is composed of 2 lanes with emergency lane, people are not allowed to walk, for safety and accident prevention
		Query on toll-fee	Mr. Rafael Tabiano, Brgy. Kgwd. Brgy. M. Chavez	No toll fee will be charged since this is not an expressway.

Environmental Component Likely to be Affected	EIA Module	Issues/Suggestions raised by the Stakeholders	Sector or Representative who raised the issues/suggestions	Issues addressed by the project and proponent
Municipality of Leganes, Iloilo				
Land **Water**	-Terrestrial Flora and Fauna -Marine ecology	Concerns on habitat, terrestrial (flora and fauna) to be affected by the project -Species such as sea grass, Dugong and mangrove plants	Mr. Jofel Coching, Zooligical Society of London-Philippines Mr. Rodney Golbeque, Zooligical Society of London-Philippines	Baseline marine ecology, terrestrial flora and fauna survey will be conducted based on proposed alignments.
People	Traffic Congestion	Issue on traffic congestion and possible mitigation	Atty. Jeorge Gregorio, Leganes Premier Land Consulting	Mitigation measures and traffic management plan will be required to contractors prior to construction. Close coordination to LGU and people in the community will be ensured.
	Project Affected	Cost of private lands to be traversed by the road project	Mayor JunJun Jaen, Municipal Mayor, Leganes	Valuation of cost and fair market value will be based on DPWH guidelines Right of Way Acquisition manual for just compensation to affected people, properties, land etc.
Others	Project Details	Query on start of project and its implementation	Engr. Samson Jaspe, Sangguniang Bayan Member, Leganes	-Year 2020: detailed engineering design (DED) -2021- right of acquisition of all affected properties and structures or period for settlement for the Land Acquisition Plan (LAP) and Resettlement Action Plan (RAP). -2022- starting of construction which will last until 2027 Given the time frame, once the alignment is final there is still a need to conduct detailed engineering design in activity. This is to assess all the affected properties by the final alignment and compensation. The selection of contractors will be conducted between year 2020 and 2021. Since this is a government project, timeframe will be followed.
		"Where is the passageway of those big ships? If we have no international port. Can we request to put up a shipyard?" "Leganes has the most feasible and strategic location for international port than in Iloilo, that is my personal belief because we are located at the middle. Leganes is the only municipality having a land mass which is an important component for a port for industrial parks. In the province of Iloilo, the Leganes is eyeing for industrial	Mayor JunJun Jaen, Municipal Mayor, Leganes	Passageway was presented with the aid of google earth. This concern will be raised to the proponent about shipyard for their consideration.

		park or economic zone since Leganes owns a property of 186 hectares. That's why I am asking if where is the passageway of those big ships in relevant to the height of the proposed bridge project." "My concern is the area of Leganes where the road alignment takes place already has a reclamation and proposal of making that area industrial zone. I don't know if this is the right forum for me to raise such concern. In my own point of view, if international port will not be put up in our area, we are asking at least for a shipyard specifically in our reclamation area. Also, consider my concern regarding our proposal on industrial economic zone. The bridge provides no employment to us, whereas the industrial economic zone will offer us income and employment."		
Others	Project Design	-Height of the bridge project and no. of lanes	Mayor JunJun Jaen, Municipal Mayor, Leganes	The proposed height is around 58 meters. The proposed is 2 to 4 lanes. The initial bridge is designed for only 28meters, but then the Philippine Port Authority of Iloilo went against to this height of bridge because the Dumangas in the future will become international port. With this, the consultants revised the designed and made the measurement 58 meters high the same as the Guimaras-Pulupandan bridge height.
		After the construction, can we request to the proponent or contractor to give us the used materials or debris?	Atty. Jeorge Gregorio, Leganes Premier Land Consulting	It is possible. Coordination to the proponent/contractor is suggested.
		Can we request/suggest for the possible re alignment of the proposed project to Municipality of Saraga, because we see that the owner of the land there is majority from Ledesma Family.	Mayor JunJun Jaen, Municipal Mayor, Leganes	This suggestion will be raised to the proponent for their consideration. Prior to the recommendation of the road alignment, the consultant had considered the road connection to C2 line.

Summary of Main Impacts and Prevention or Mitigation and Enhancement Measures and Target Performance/Efficiency Measures

Project Phase	Environmental Component	Potential Impact	Proposed Prevention or Mitigation or Enhancement Measures	Target Performance/ Efficiency Measures
I. Pre-Construction Phase				
Securing of Permits and Clearances from National and Local Agencies	People	Increase in government revenues	Submission of documents required by the national and local agencies	100% compliance on regulatory and government requirements
Hiring of staff for preparatory works prior to construction		Economic/ job opportunity	Priority will be given to qualified residents in the project areas	Labor requirement to source out to local community for qualified and skilled workers; 100% compliance to DOLE labor wages and benefits
Land acquisition and Displacement of Affected families		Loss of properties, livelihood	-Resettlement/relocation; Fair just compensation -provision of livelihood assistance	90%-100% provision on resettlement implementation based on the final agreement between DPWH and the Project Affected Persons (PAPs).
II. Construction Phase				
Construction, Civil works, development of precast segments and site clearing	The Land	Change in land use Soil erosion Increase run off Destabilization of slope	• Set-up temporary fence around the construction area • Conduct slope stability analysis and construct silt trap and spoils disposal area • Limit the area of grading to the facility and access roads. • Spoil materials will be used as fill and as construction materials for site preparation. • The negative impact is insignificant and short term but irreversible	Land clearing operations will ensure 90%-100% efficiency by DPWH. Project equipment, facilities and civil works are designed and built to meet 100% of pertinent environmental impact mitigation requirements
		Removal of vegetation and habitat disturbance	• Cutting Permit will be secured if there are trees that will be affected during construction • Limit land clearing in designated sites only. • Establishment of a small nursery as source of planting materials using the endemic species and fruit-bearing trees found onsite for the replacement of trees to be cut or removed • Gradual clearing and removal of vegetation to provide sufficient time for wildlife species to transfer to the nearby habitat. Planting of naturally-grown species in the	100% tree inventories and tree cutting permit will be in placed. Tree replacement in compliance with DENR requirements will be complied (replacement and replanting of 50

Project Phase	Environmental Component	Potential Impact	Proposed Prevention or Mitigation or Enhancement Measures	Target Performance/ Efficiency Measures
			designated areas might encourage the wildlife species to return in the future. • Ensure solid waste management plan prior to mobilization of project; proper segregation and disposal shall be included in the program; Strictly require contractors and their workers to observe proper waste disposal and sanitation	trees per planted tree species and 100 per naturally growing tree species)
Construction, Civil works, development of precast segments and site clearing	The Water	• Increase in run-off -Generation of domestic wastewater -Generation of wastewater from comfort rooms, cleaning of construction equipment, vehicles and regular watering activities • Contamination of surface and marine water with oil and grease, suspended solids, pH • Terrestrial and marine habitat disturbance	• Provision of portable portalets during construction and management of domestic wastewater to meet and comply with DENR effluent guidelines. • Site clearing will be limited to areas needed and restricted to acceptable weather conditions • No clearance or establishment works will be undertaken during high rainfall conditions to reduce the risk of sediment loss to the environment • Set up adequate toilet facilities; ensure sufficient washrooms for workers • Construction of settling ponds to contain inflow of muddy waters • Installation of oil traps and proper storage of used oil • Implement efficient construction methodology to shorten disturbance resulting from possible siltation	80-100% siphoning of domestic wastewater collected from portalets catch basin by accredited hauler/treater. 100% compliance on DENR Ambient Water Quality standards of RA 9275 / DAO 2016-08. 100% ambient water and coastal marine water quality monitoring to ensure oil and grease concentration is below 2 mg/L for Class C and below 1 mg/L for Class B; Below 80 mg/L for suspended solids and between pH 6.0-9.0 for Class C. DPWH contractors will comply with standards. 80%-100% mitigation measures will be complied by DPWH contractors; use of silt curtains and sediment traps to reduce solids emissions in marine waters
Construction, Civil works, development of precast segments and site clearing	The Air	• Dust generation during clearing of the site and stockpiling of soil • Dust generation during opening up of pits, associated with movement of vehicles and	• Roads will be watered especially during hot and dry weather. Regular water spraying by water sprinklers (road tank watering) during construction. • Regulate speed of delivery/ hauling trucks • Provide equipment with ear plugs, mufflers and proper scheduling of noise-generating activities	100% compliance to Clean Air Act (RA 8749). 100% regular water sprinkling activities to prevent dust emissions especially during summer/dry season 100% Regular ambient air monitoring to control dust emission ≤300 µg/Ncm in 1-hour sampling

Project Phase	Environmental Component	Potential Impact	Proposed Prevention or Mitigation or Enhancement Measures	Target Performance/ Efficiency Measures
		machinery and excavation, transportation and emplacement of rock and soil • Exhaust fumes from vehicle emissions		
	The Noise	• Noise from vehicles and construction activities		100% mitigation of noise level from construction activities perceived in residential and commercial areas nearest to project and ensure compliance on noise limits based on NPCC 1978 Rules and Regulations in Noise
Construction, Civil works, development of precast segments and site clearing	The People	• Increase in livelihood and business opportunities • Increase in revenues	• Alleviate economy and generation of income to hosts and nearby barangays • Increased LGU revenues resulting from the purchase of locally available materials and equipment for construction, translating to additional taxes. Business establishments should be properly registered and payment of the required taxes shall be monitored.	
		• Provide job opportunities for construction workers	• The construction of the project will generate employment opportunities for local residents as well as migrant workers. It will bring increased income to those who will be employed. Local manpower may have to compete with migrant labor for employment. Employment of local residents during the construction stage shall be given priority, particularly those from families in the Direct Impact Area.	Labor requirement to source out to local community for qualified and skilled workers; 100% compliance to DOLE labor wages and benefits
		• Health and Safety Risk	• Use of appropriate PPEs and proper training of workers; strict implementation of health and safety plans and programs including road safety; comply with DOLE requirements	Ensure zero (0) accident on accidents; 90-100% compliance to sanitation, health and safety guidelines and standards of DOLE

Project Phase	Environmental Component	Potential Impact	Proposed Prevention or Mitigation or Enhancement Measures	Target Performance/ Efficiency Measures
Construction, Civil works, development of precast segments and site clearing	Solid and Hazardous Wastes	Used oil, paint wastes, scrap metals, busted lamps, and spent fuels	• Ensure a Solid Waste Management Plan to cover proper segregation, waste handling, waste storage and a waste disposal system. • Employ waste management strategies on reduce, re-use and recycle programs - Reduce – Reduction of waste through less packaging by promoting bulk purchasing without packaging; less single-use devices - Reuse – Choose water supply, office supplies that are re-usable, e.g. use printer inks that are refillable - Recycle – Composting the water supply and kitchen waste is a very useful form of recycling -Waste receptacles/bins shall be provided in strategic locations within the work areas. There shall be an identified designated area for the temporary disposal of domestic and construction wastes -Proper handling, transport and storage of chemicals such as used oil, used batteries, busted lamps etc. must comply with local regulations -Selling of scrap metals and used oil will adhere to local regulations	100% practice and implementation of 3Rs, (Re-use, recycle, Recover) materials; 100% disposal of debris to LGU accredited /registered hauler and disposed in landfill/material recovery facility. Solid Waste management on biodegradable wastes are 90-100% implemented and composted. 100% compliance to DENR RA 9003 100% implementation of 3Rs. 100% compliance to DENR RA 6969 standards
			• Safety Data Sheet will be in place • Climate Change Adaptation: - Reduction of greenhouse emissions from energy used in offices by using green energy power or use of lighting that is environment friendly such as LED lights. - Implementation of rain water harvesting - Recycle office paper, newspapers, beverage containers, electronic equipment and batteries. Reducing, reusing and recycling in the office helps conserve energy, and reduce pollution and greenhouse gases from resource extraction, manufacturing, and disposal. Reduce, reuse, and recycle in the office can be done by using two-sided printing and copying, buying supplies made with recycled content, and recycling used printer cartridges. For old electronics, donate used equipment to other organizations or sold to accredited scrap buyers.	80%-100% compliance to Climate Change Adaptation and reduction of GHG sources to replace with environment friendly materials, products etc.

Project Phase	Environmental Component	Potential Impact	Proposed Prevention or Mitigation or Enhancement Measures	Target Performance/ Efficiency Measures
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Operational Phase				
Movement of vehicles; Vehicle transport	The Water	• Increase in run-off -Generation of wastewater from surface runoff Contamination of surface and marine water with oil and grease, suspended solids, pH • Terrestrial and marine habitat disturbance	• Construction/installation of oil and sediment traps	100% compliance on DENR Ambient Water Quality standards of RA 9275 / DAO 2016-08. 100% ambient water and coastal marine water quality monitoring to ensure oil and grease concentration is below 2 mg/L for Class C and below 1 mg/L for Class B; Below 80 mg/L for suspended solids and between pH 6.0-9.0 for Class C. DPWH contractors will comply with standards. 80%-100% mitigation measures will be complied by DPWH contractors;
Economic Development	The People	• Increase in local revenues and collection of taxes to LGUs • Shorten travel time going to and from inter-municipality	Mitigation is not applicable; positive impact	
Demolition Phase				
Demolition Activities	The Land	Land and marine water degradation Damage to access and existing roads	Preparation and implementation of comprehensive abandonment management plan Proper clean-up and decontamination of affected site Proper dismantling of equipment, concrete roads etc. Disposal of hazardous waste Maintenance and rehabilitation of roads with drainage system in place Provision of alternative livelihood (as necessary)	100% compliance on DENR requirements on demolition works and abandonment plan