

## Environmental Impact Statement (EIS) Summary for the Public in English

### NLEX-C5 (Segment 8.2) North Link Project

#### Project Information

Project Name	<b>NLEX-C5 (Segment 8.2) North Link Project</b>
Nature of Project	<b>Roads (new construction)</b>
Project Location:	<b>Brgys. West Fairview, Holy Spirit, Matandang Balara, Culiat, Sauyo, Talipapa, Bagbag, Pasong Tamo, UP Campus, and Pansol, Quezon City and Brgy. Ugong, Valenzuela City</b>
Name of Proponent	<b>NLEX Corporation</b>
Office Address	<b>NLEX Compound, Balintawak, Caloocan City</b>
Representative	<b>Mr. Raul L. Ignacio</b> <i>Chief Operating Officer</i> <b>+632 580 8900 (tel.)</b>
EIS Preparer	<b>Gaia South, Inc., <i>Environmental Consultants</i></b>
Office Address	<b>7<sup>th</sup> Floor Montepino Bldg., Adelantado cor. Gamboa St., Legaspi Village, Makati City</b>
Contact Person	<b>Ebert T. Bautista</b> <i>Project Director</i> <b>+63 2 8935661 (tel.) / +63 2 8935657 (fax)</b>

#### Summary of the Proposed Project Components and Requirements

Parameter	Unit	Size	Description
Length	km	11.5	Total project length
Travel Time	Min	8	Class 1 at 80 kph
	Min	11	Class 2 & 3 at 60 kph
Right-of-Way	m	90	ROW from Mindanao Ave. to Regalado Ave.  60m is intended for the expressway while 30m is allotted for the proposed relocation site.
	m	60	ROW from Regalado Ave. to C.P. Garcia.
Power Source			Construction: Sourced from MERALCO and generator sets.
	KWh per year	169,520	Operation: Sourced from MERALCO.
Domestic Water Source			Construction: Water utilized by the workers during the construction

Parameter	Unit	Size	Description
			period will be sourced from Maynilad/MWSS for civil work activities and domestic requirements of the laborers.  Operation: Water supply during operation will be sourced from Maynilad/MWSS.
Water Requirement	m <sup>3</sup> per month	220	Operation: Water usage is limited to domestic use only.
Fuel requirement	L per month	500	Operation: Service vehicles
Manpower requirements	Workers	1130	Construction
	Workers	60	Operation
Project Cost	PhP	8.1 billion	

## Background of the Project

The *Build! Build! Build!* Program is the administration's comprehensive infrastructure development program launched in April 2017 under the ten-point Socio-Economic Agenda that outlines the reforms of the government with the goal of economic growth, job creation, and improvement in the lives of the Filipinos. One of the outlined reforms is the acceleration of annual infrastructure spending with public-private partnership playing a key role. The program identified 70 infrastructure flagship projects, 19 of which are located in Mega Manila.

The proposed **NLEX-C5 (Segment 8.2) North Link Project ("Segment 8.2")** forms part of the C5 Northern Arc portion of the Manila North Tollways Project (MNTTP) Phase 2, which will link Carlos P. Garcia Avenue to Segment 8.1 at Mindanao Avenue). Phase 2 is composed of the development of two (2) road sections: *Section 1* from Barangay Ugong, Valenzuela City, passing through Barangay Bagbag to Luzon Avenue and *Section 2* from Luzon Avenue to C.P. Garcia Avenue. The affected portions were grouped into Sections 1 and 2. Section 1 already has Detailed Engineering Design, inclusion to the Local Inter-Agency Committee (LIAC), pre-Resettlement Action Plan (RAP), and timeline of social preparation activities. Section 2, on the other hand, already has a conceptual engineering design.

The project will use a portion of the existing Republic Avenue alignment Right-of-Way (ROW) and the Luzon Avenue within the ROW of the Metro Manila Waterworks and Sewerage System (MWSS) ROW. When completed, the expressway will connect the North Luzon Expressway (NLEX) to Eastern Metro Manila.

## Project Location

Segment 8.2 is part of the High Standard Highways Metro Manila Masterplan. The proposed project is vital in decongesting Metro Manila by providing vehicles an alternative route towards C5. Segment 8.2 is intended to link C.P. Garcia Avenue in Diliman, Quezon City to Segment 8.1 at Mindanao Avenue in Novaliches, Quezon City. The 11.5 km highway will pass through 11 barangays. Ten of these barangays are located in Quezon City: West Fairview, Holy Spirit,

Matandang Balara, Culiat, Sauyo, Talipapa, Bagbag, Pasong Tamo, UP Campus, and Pansol. The remaining barangay, Brgy. Ugong, is in Valenzuela City.

## Impact Areas

The direct impact area (DIA) will cover the ROW of the project and the additional 100m both sides based on noise impact during the operation. Indirect impact area (IIA) will be the host barangays that are considered as project beneficiaries for employment, livelihood, relocation, taxes, and other benefits from the decongestion of the roads. As presented above, the identified barangays based on the alignment include the 10 barangays located in Quezon City: West Fairview, Holy Spirit, Matandang Balara, Culiat, Sauyo, Talipapa, Bagbag, Pasong Tamo, UP Campus, and Pansol, and Brgy. Ugong in Valenzuela City.

## Project Components

The proposed NLEX Segment 8.2 will have a total length of 11.5-kilometer expressway linking the existing NLEX Segment 8.1 (Mindanao Avenue Link) to CP Garcia Avenue and Commonwealth Avenue. Project development will be divided into two sections: Section 1 from Mindanao Avenue to Luzon Avenue and Section 2 from Luzon Avenue to C.P. Garcia.

### Major Components

The expressway is initially designed as combination of at-grade carriage roadway, interchanges at Mindanao, Regalado and Commonwealth Avenue waterway bridge at Tullahan River, overpass bridges over Quirino, Sauyo and Chestnut Road, viaduct along Luzon Avenue and Katipunan, subgrade foundation structures, tollway facilities and other support facilities.

#### *NLEX Segment 8.2 Section 1*

The proposed project begins at the end of Segment 8.1 in Mindanao Avenue the alignment will traverse the 90-m ROW (approximate) going towards Regalado Ave. The expressway will utilize 60 meter of the ROW while the remaining 30 meters is intended for the proposed relocation site. Major intersections will be provided with vehicular crossings, including at Quirino Ave., Sauyo Road and Chestnut Road. Service road will be provided to serve local traffic that need to access properties adjacent to the expressway. The expressway is 6.3 km at-grade expressway from Regalado Avenue to Luzon Avenue.

#### *NLEX Segment 8.2 Section 2*

Section 2 is the part of the expressway from Luzon Avenue to C.P. Garcia, where the proposed project ends. The alignment will traverse the 60-m ROW. From the junction of Regalado Avenue to C.P. Garcia, the 5.2-km expressway will be elevated.

This section includes the proposed Commonwealth Interchange, the proposed on-ramp in front of the MWSS Compound and the proposed off-ramp in C.P. Garcia.



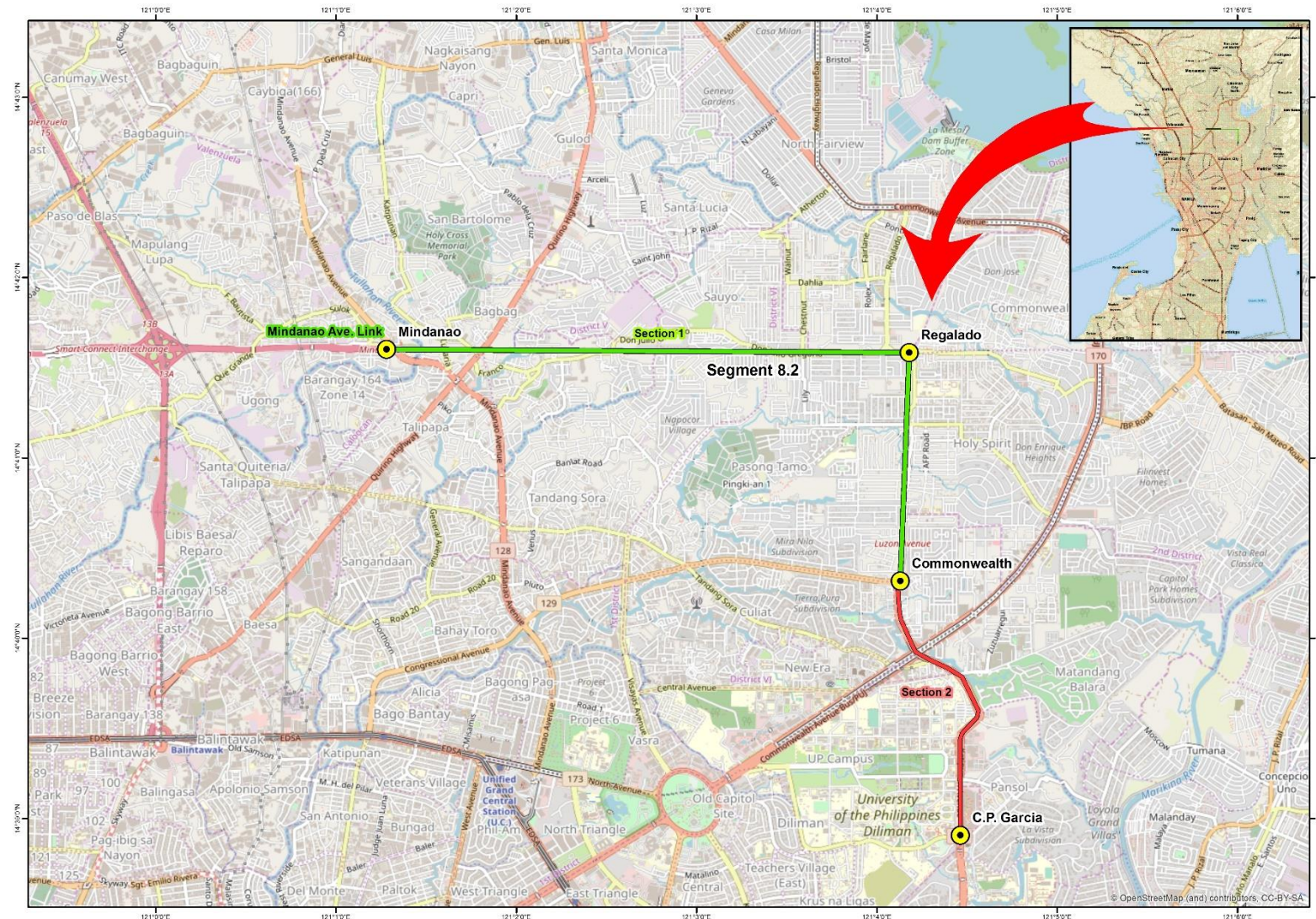


Figure 1. Location map of the proposed NLEX-C5 (Segment 8.2) North Link Project.



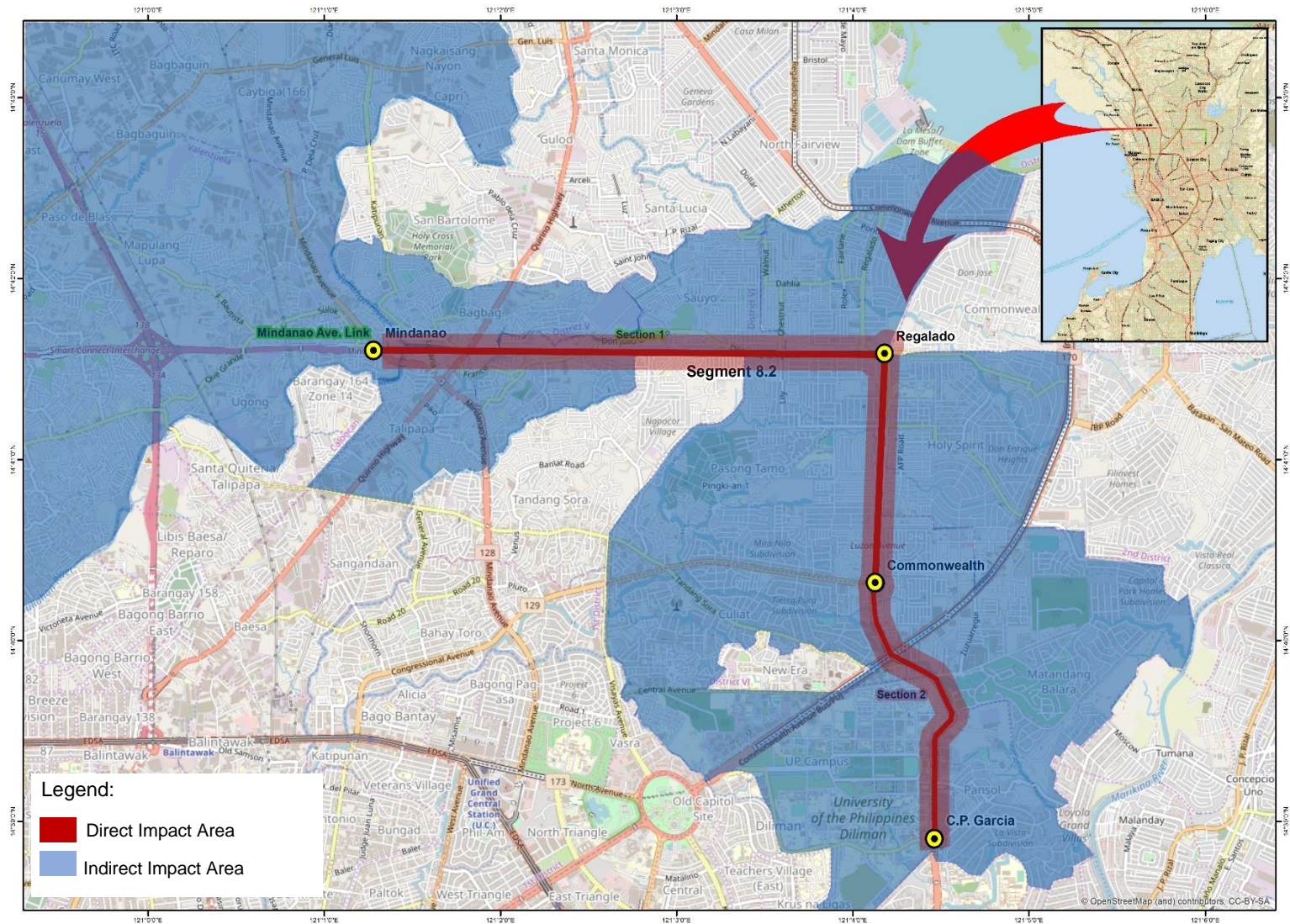


Figure 2. NLEX impact areas.

## Project Technology

### NLEX Expressway Operation Process

The MNTC uses the following toll booth technology for their transactions:

- Cash – manual transactions operated by tellers. Due to its nature, the transactions are prone to miscalculations and pilferage; thus, the expressway relies on new forms of technology for its operation.
- Dedicated Short Range Communication System (DSRC) – EZ Pass is a form of DSRC which belongs to the RFID family. This technology uses the microwave frequencies (5.45-5.9 GHz). Due to the cost of the installation of the unit, a shift to passive RFID is currently being done.
- Radio Frequency Identification (RFID) – RFID stickers are passive tags that are relatively new. Since this is sticker-based, it is anticipated that more users of the expressway will subscribe to RFID.

### Fuel Requirement

Fuel requirement during construction will be based on the use of heavy equipment, transport and service vehicles. The hired contractor will supply the fuel used in the activities of this phase. It is estimated that the fuel requirement during this phase is 500 liters of diesel for the use of service vehicles and back-up generators during power interruptions.

### Power requirement

Power supply during construction will either be tapped from the nearest electricity source, MERALCO, or using generator sets. Electricity demand will come from temporary site facilities or camps that the contractors will also build during this phase. Power supply during operation will be sourced from MERALCO. The estimated power requirement during this phase is 169,520 KWh per year.

### Water Supply

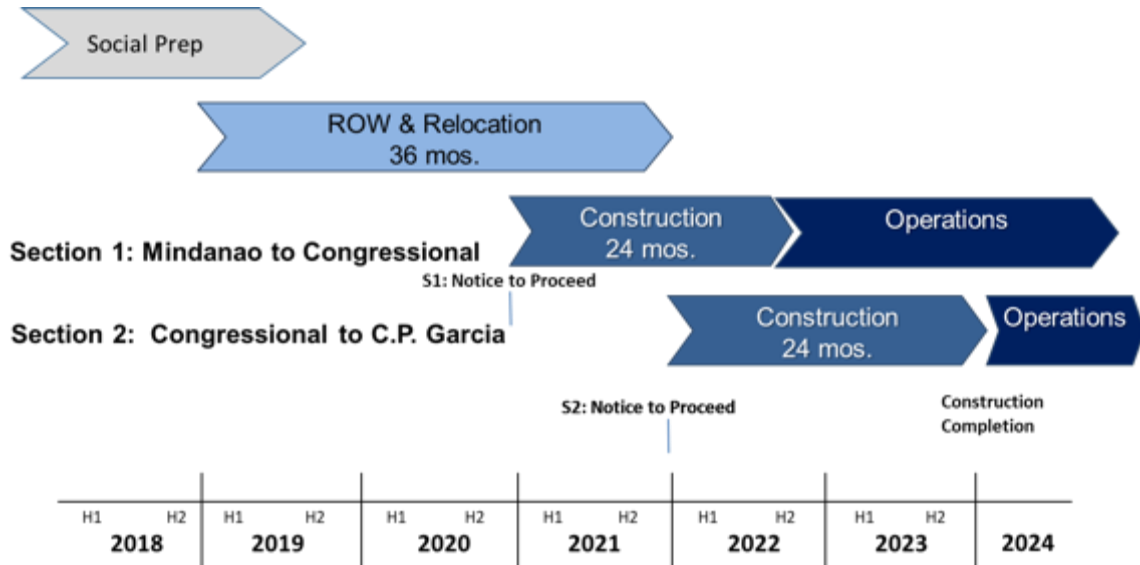
The water utilized by the workers during the construction period is minimal and will be sourced from the local water district. The water consumed by the temporary facilities and workers is considered low. Heavy water usage, however, will come from production of concrete products. The contractors usually commission batching plant suppliers that provide the water required during the construction of the road section. All necessary permits will be secured by the contractor prior to the commencement of the development phase.

Water supply during operation will be sourced from Maynilad. It is estimated that the water requirement during this phase is 220m<sup>3</sup> per month. Water will be used for indoor water use (e.g., restroom, cleaning, washing) and outdoor (e.g., landscaping).

## Project Timeframe

From the social preparations to the operation, Section 1 of the project will take five (5) years to be completed while Section 2 will require about two (2) years to accomplish. The social preparations, such as continuous Information, Education, and Communication (IEC) campaigns and conduct of resettlement planning, started 2018. The relocation, which will take

36 months, is expected to be completed by 2021. The construction of Section 1 of the proposed project will start by 2021 and is expected to be completed by 2023.



**Figure 3.** Indicative timeline of NLEX-C5 (Segment 8.2) North Link Project.

## Impacts Management Plan

Project Phase/ Environmental Aspect	Environmental Component Likely to be affected	Potential Impact	Options for Prevention or Mitigation* or Enhancement
<b>Pre-Construction Phase</b>			
Completion of required MOAs, endorsements and clearances	People	<ul style="list-style-type: none"> <li>Social acceptance and support for the project</li> </ul>	<ul style="list-style-type: none"> <li>Information, Education, and Communication (IEC) on the project to inform, respective institutions, agencies, offices, bodies and organizations for providing their respective endorsements and/or clearances.</li> </ul>
Land acquisition	Land use and classification	<ul style="list-style-type: none"> <li>Incompatibility with the Existing Land Use</li> </ul>	<ul style="list-style-type: none"> <li>Identify future land use of surrounding areas that will result to a significant increase of transportation-oriented developments in cooperation with urban planners of LGUs to adopt in the future developments.</li> </ul>
	People	<ul style="list-style-type: none"> <li>Displacement of residents and few commercial establishments along the Right-Of-Way (ROW)</li> </ul>	<ul style="list-style-type: none"> <li>Prepare and implement Resettlement Action Plan (RAP) in coordination with National Housing Authorities (NHA), LGUs, lot owners and other concerned stakeholders and agencies to address the issue on land acquisition and relocation of individuals/families.</li> </ul>
Resettlement for affected families/individuals	People	<ul style="list-style-type: none"> <li>Improvement of living conditions due to resettlement/relocation</li> </ul>	<ul style="list-style-type: none"> <li>IEC on the project regarding the activities on resettlement and packages for project affected individuals/ families.</li> <li>Prepare and implement RAP including packages and livelihood programs.</li> </ul>
Clearing of existing vegetation along the ROW	Terrestrial ecology (flora)	<ul style="list-style-type: none"> <li>Vegetation removal</li> </ul>	<ul style="list-style-type: none"> <li>Conduct 100% inventory of the affected trees along the alignment to determine the total counts, category, and characteristics of affected trees and minimize removal particularly in areas adjacent to vegetation of higher conservation significance as much as possible. Native/endemic/ indigenous species of trees, shrubs and grasses will be specified.</li> <li>Limit clearing of vegetation.</li> </ul>
<b>Construction Phase</b>			
<ul style="list-style-type: none"> <li>Demolition and resettlement</li> </ul>	In-migration	<ul style="list-style-type: none"> <li>Increased number of illegal settlers</li> </ul>	<ul style="list-style-type: none"> <li>Plan and implement construction schedule to shorten time between the preconstruction and construction as much as possible.</li> <li>Install fencing and guarding of the proposed project to restrict the public from entering the ROW.</li> </ul>
<ul style="list-style-type: none"> <li>In migration to relocation site</li> </ul>	Basic Services/ Resources	<ul style="list-style-type: none"> <li>Increased demand on public infrastructure,</li> <li>Degradation on livelihood</li> </ul>	<ul style="list-style-type: none"> <li>Prepare and implement RAP in consideration of relocation site to be sufficiently covered the expected demand of basic services and resource and social programs at relocation sites in coordination with LGUs.</li> </ul>



Project Phase/ Environmental Aspect	Environmental Component Likely to be affected	Potential Impact	Options for Prevention or Mitigation* or Enhancement
<b>Pre-Construction Phase</b>			
			<ul style="list-style-type: none"> <li>Prepare and implement Social Development Plan (SDP) in coordination with the host LGUs to align projects or programs to their development plans.</li> </ul>
<ul style="list-style-type: none"> <li>Employment of locals</li> </ul>	Gender and children	<ul style="list-style-type: none"> <li>Generation of livelihood opportunities</li> </ul>	<ul style="list-style-type: none"> <li>Prepare and implement RAP to ensure that gender equality and needs of vulnerable group are well addressed.</li> <li>Employ workers in consideration to gender equality.</li> <li>Include gender sensitive livelihood and skills training program in the SDP with due consideration to vulnerable group.</li> </ul>
<ul style="list-style-type: none"> <li>Rerouting of roads and blocking of access roads</li> <li>Delivery of construction materials</li> <li>Influx of commuters due to additional construction workforce</li> </ul>	Traffic	<ul style="list-style-type: none"> <li>Increase in traffic volume</li> </ul>	<ul style="list-style-type: none"> <li>Plan for construction sites/facilities and access route in consideration to health and safety of local communities.</li> <li>Schedule transport of heavy structures during period when there are fewer vehicles on the road and posting of appropriate traffic signage and warnings.</li> <li>Disseminate information to the general public, host barangays and LGUs on the potential impact of the project to the existing access.</li> </ul>
<ul style="list-style-type: none"> <li>Operation of heavy equipment around construction areas</li> </ul>	Threat to health and safety of the community	<ul style="list-style-type: none"> <li>Degradation of public health</li> <li>Increase in accident involving local communities</li> </ul>	<ul style="list-style-type: none"> <li>Provide safety officers to monitor the health and safety of the local community.</li> <li>Install fencing of the construction site, provision of signage and posters, and guarding of the access point to ensure that the area is not accessible to the public.</li> <li>Plan and implement social development plan including health and safety of local community.</li> <li>Implement ERP and Health and Safety Management Plan.</li> </ul>
Clearing of vegetation	Terrestrial Ecology (Flora)	<ul style="list-style-type: none"> <li>Vegetation removal and loss of habitat</li> <li>Threat to existence and/or loss of important local species</li> <li>Threat to abundance, frequency and distribution of important species</li> </ul>	<ul style="list-style-type: none"> <li>Prior to any clearing activity, clearly mark the ROW to avoid the unnecessary clearance of tree cutting.</li> <li>Naturally growing trees requires planting of 100 seedlings while one tree that is planted will require compensation of 50 seedlings. Whenever possible, small trees and saplings shall be balled-out and relocated along other portions that will be not be included in the site development.</li> </ul>
<ul style="list-style-type: none"> <li>Site preparation</li> <li>Excavation</li> </ul>	Hydrology	<ul style="list-style-type: none"> <li>Flooding and inundation by sediment run off, siltation, drainage overflow, clogging</li> </ul>	<ul style="list-style-type: none"> <li>Minimize the removal of vegetation and alteration of topography as much as possible.</li> <li>Install soil erosion control such as protection of slope and bank silt traps to minimize siltation of waterways as required.</li> </ul>

Project Phase/ Environmental Aspect	Environmental Component Likely to be affected	Potential Impact	Options for Prevention or Mitigation* or Enhancement
<b>Pre-Construction Phase</b>			
<ul style="list-style-type: none"> <li>Commencement of construction activities</li> </ul>			<ul style="list-style-type: none"> <li>Strictly implement construction plan, operating instructions and solid waste / soil management plan, which include minimization of waste/soil generation, segregation, and proper disposal by contractor in accordance to RA 9003.</li> <li>Regular inspection and prompt maintenance of the drainage system, all installed structures and facilities and improve/ enhance capacity when possible.</li> </ul>
Earthworks including excavation activities and improper handling and disposal of domestic and hazardous wastes including disposal of excavated soil, leftover concrete by excavation activities (Excavated Soil)	Land Value	<ul style="list-style-type: none"> <li>Generation of excavated materials</li> <li>Devaluation of land value as a result of improper solid waste management</li> </ul>	<ul style="list-style-type: none"> <li>Strictly implement solid waste management plan and proper disposal by contractor in accordance with RA 9003.</li> <li>Conduct IEC campaign on waste management to the communities.</li> <li>Place excavated materials on appropriate dump sites or spoils area and with adequate containment.</li> <li>Strictly implement hazardous waste disposal in accordance with RA 6969.</li> </ul>
Earthworks (excavation, backfilling, stockpiling)	Geology/Geomorphology	<ul style="list-style-type: none"> <li>Liquefaction, ground subsidence, etc.</li> </ul>	<ul style="list-style-type: none"> <li>Monitoring of excavation is recommended in order to identify geologic structures that may exist on site.</li> <li>Establish adequate foundation depth in compliance with the national building code.</li> <li>Comply with the recommended seismic design to minimize the impact of ground shaking to the proposed project.</li> <li>Geotechnical investigation should be done to determine presence of interbedded soil or clay in areas where pier foundation will be placed.</li> <li>Layers with loose sediments should be removed and pier foundations should be constructed on competent soil or rock layer.</li> <li>Ensure that footings of pier foundations are built on competent rock or soil layers.</li> <li>Appropriate engineering measures to prevent loss of soil bearing capacity that can induce settlement should be in place.</li> <li>Compacting and grouting of foundations should be done to minimize loss of soil strength.</li> <li>Provision of adequate drainage system within the project alignment will minimize the threat of flooding.</li> <li>Covering up of any natural drainage channels is not recommended.</li> </ul>

Project Phase/ Environmental Aspect	Environmental Component Likely to be affected	Potential Impact	Options for Prevention or Mitigation* or Enhancement
<b>Pre-Construction Phase</b>			
			<ul style="list-style-type: none"> <li>• Embankment should be constructed around pier footings to minimize flood hazard.</li> <li>• Proper inspection of all installed and constructed / ongoing construction structures and facilities.</li> <li>• Coordinate with the Philippine Institute of Volcanology and Seismology (PHIVOLCS) during earthquake and volcanic events to adjust construction schedule.</li> <li>• Conduct earthquake drills for workers.</li> </ul>
<ul style="list-style-type: none"> <li>• Earthworks (excavation, backfilling, stockpiling)</li> </ul>	Water Quality	<ul style="list-style-type: none"> <li>• Degradation of surface water</li> <li>• Siltation</li> </ul>	<ul style="list-style-type: none"> <li>• Place excavated material in temporary staging area with provision for silt traps/ siltation pond to avoid silt draining to waterways, degradation of surface water quality and clogging of waterways, if necessary. Dimension of the drainage trap is 0.7m H x 0.7m W.</li> <li>• Conduct regular surface water quality monitoring.</li> </ul>
<ul style="list-style-type: none"> <li>• Generation of dust and noise, vibration, and illumination pollution.</li> </ul>	Terrestrial Ecology (Fauna)	<ul style="list-style-type: none"> <li>• Threat to abundance, frequency and distribution of important species</li> </ul>	<ul style="list-style-type: none"> <li>• Prepare and implement a tree and vegetation management plan as part of the construction plan considering the significance to fauna (local bird species) such as installing buffer zone, minimizing the use of herbicide and machinery as much as possible.</li> <li>• Plant fruit-bearing trees and other tree species that can provide food resource for wildlife in the future, as part of the compensation of the trees to be felled.</li> </ul>
<ul style="list-style-type: none"> <li>• Movement of vehicles and equipment</li> </ul>	Air quality	<ul style="list-style-type: none"> <li>• Generation of dust</li> <li>• Exhaust emissions from heavy equipment, including standby generators</li> <li>• Increase in Noise Levels</li> <li>• Increase in Vibration Levels</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize vegetation removal.</li> <li>• Conduct proper inspection and preventive maintenance of heavy equipment, machineries, and service vehicles to meet the DENR Emission Standard.</li> <li>• Control vehicle movement maintaining the speed limit within the construction site to &lt;10kph and minimize vehicle transport by maximizing the use of site generated materials.</li> <li>• Monitor air quality at identified nearby sensitive receptors regularly and evaluate effectiveness of the air pollution reduction measures provided.</li> <li>• Contractors must also be required to put tarpaulin covers on trucks loaded with construction materials</li> <li>• Provision of tire baths</li> <li>• Application of permit to operate for air pollution source installation for covered standby generator sets</li> </ul>
<ul style="list-style-type: none"> <li>• Accidental spills of fuels /lubricants from</li> </ul>	Pedology	<ul style="list-style-type: none"> <li>• Degradation of soil quality (soil contamination)</li> </ul>	<ul style="list-style-type: none"> <li>• Proper inspection and maintenance of machines and equipment.</li> </ul>



Project Phase/ Environmental Aspect	Environmental Component Likely to be affected	Potential Impact	Options for Prevention or Mitigation* or Enhancement
<b>Pre-Construction Phase</b>			
<ul style="list-style-type: none"> <li>construction vehicles &amp; machineries/ hazardous chemicals.</li> <li>Generation and improper handling/disposal of domestic wastes</li> <li>Generation and improper handling/disposal of hazardous wastes.</li> </ul>			<ul style="list-style-type: none"> <li>Strictly implement solid waste management plan and proper disposal by contractor in accordance with RA 9003.</li> <li>Installation and operation of oil pit separator with dimensions 0.25m H x 0.30m W and fuel tank with traps.</li> <li>Strictly implement waste management plan and proper disposal by contractor in accordance with RA 6969.</li> <li>Conduct soil quality monitoring in case of any possible contamination events occur.</li> </ul>
<ul style="list-style-type: none"> <li>Discharge of wastewater, from construction sites</li> <li>Accidental spills of fuels and lubricants from construction vehicles and machineries, as well as other hazardous chemicals like paints and solvents.</li> <li>Generation and improper handling and disposal of construction, domestic and hazardous wastes.</li> </ul>	Water Quality	<ul style="list-style-type: none"> <li>Degradation of surface water</li> <li>Siltation</li> </ul>	<ul style="list-style-type: none"> <li>Conduct quarterly surface water quality monitoring.</li> <li>Install wastewater treatment, portable sanitary facilities (20 portalets) at construction sites. Wastewater treatment plant has dimensions wastewater treatment is 5.7m L x 3.4m W x 4.3m H with an average volume of 83.33 cu.m.. Wastes from portable toilets shall be collected by registered hauler for disposal. Once the toilet has been emptied, it will be rinsed a few times to clean it, refilled with a suitable disinfectant, if appropriate, and returned to its usual location.</li> <li>Conduct proper inspection and regular maintenance of construction machineries, equipment, vehicles and wastewater treatment equipment and facilities with appropriate measure to collect any leakage.</li> <li>Comply with environmental permitting requirements for the storage, transport, handling, and treatment of hazardous material/ wastes and contaminated soil in accordance with RA 6969 and solid waste / soil management plan, which include minimization of waste/soil generation, segregation, and proper disposal including the temporary storage by contractor in accordance with RA 9003.</li> </ul>
<ul style="list-style-type: none"> <li>Commencement of construction</li> <li>Movement of vehicles and equipment</li> </ul>	Climate change	<ul style="list-style-type: none"> <li>Exhaust emissions from equipment</li> </ul>	<ul style="list-style-type: none"> <li>Conduct proper inspection and preventive maintenance of heavy equipment, machineries and service vehicles to meet the DENR Emission Standard.</li> <li>Use electric or fuel-efficient equipment, machineries and vehicles and maximize its operation if possible.</li> </ul>
Construction activities	Occupational health	<ul style="list-style-type: none"> <li>Increase risk of accidents at construction sites</li> <li>infectious disease of workers</li> </ul>	<ul style="list-style-type: none"> <li>Prepare and implement occupational Health and Safety Management Plan.</li> </ul>

Project Phase/ Environmental Aspect	Environmental Component Likely to be affected	Potential Impact	Options for Prevention or Mitigation* or Enhancement
<b>Pre-Construction Phase</b>			
			<ul style="list-style-type: none"> <li>• Provide safe and clean water for drinking, appropriate sanitary facilities such as portable toilets and waste bins.</li> <li>• Implement construction plan including storage of equipment and machinery, and access route of heavy vehicle considering health and safety of workers.</li> <li>• Provide appropriate personal protective equipment (PPE) to all construction workers, particularly to the personnel working on heights, heavy and electrical equipment.</li> </ul>
• Operation Phase			
Employment of locals	Local economy	<ul style="list-style-type: none"> <li>• Generation of employment opportunities</li> </ul>	<ul style="list-style-type: none"> <li>• Close coordination with the host LGUs (barangay level) regarding the hiring of workers to ensure that the workers being considered are legitimate residents in the area. Those affected by the Project will be prioritized for employment.</li> </ul>
Operation of the expressway	In Migration	<ul style="list-style-type: none"> <li>• Influx of Informal Settlers Families (ISFs)</li> </ul>	<ul style="list-style-type: none"> <li>• Install fencing and provide guards to prevent the settlement of ISFs along the ROW.</li> <li>• Installation of signages in strategic areas</li> </ul>
	Air quality	<ul style="list-style-type: none"> <li>• Generation of dust</li> <li>• Exhaust emissions from equipment</li> <li>• Increase in Noise Levels</li> <li>• Increase in Vibration Levels</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct proper inspection and preventive maintenance of heavy equipment, machineries and service vehicles to meet the DENR Emission Standard.</li> <li>• Control vehicle movement maintaining the speed limit.</li> <li>• Monitor air quality at identified nearby sensitive receptors regularly and evaluate effectiveness of the air pollution reduction measures provided.</li> </ul>

Project Phase/ Environmental Aspect	Environmental Component Likely to be affected	Potential Impact	Options for Prevention or Mitigation* or Enhancement
<b>Pre-Construction Phase</b>			
			<ul style="list-style-type: none"> <li>Provision of effective height of noise barriers on each side of the ROW especially on areas with sensitive receptors such as school, hospital, residential area.</li> </ul>
	Threat to Health and safety of the community	<ul style="list-style-type: none"> <li>Degradation of public health</li> <li>Increase in accident involving local communities</li> </ul>	<ul style="list-style-type: none"> <li>Provide safety officers to monitor the health and safety of the local community.</li> <li>Install fencing of the construction site, provision of signage and posters, and guarding of the access point to ensure that the area is not accessible to the public.</li> <li>Plan and implement social development plan including health and safety of local community.</li> <li>Implement Emergency Response Plan and Health and Safety Management Plan.</li> </ul>
	Occupational health	<ul style="list-style-type: none"> <li>Increase risk of accidents</li> <li>Infectious disease of employees</li> </ul>	<ul style="list-style-type: none"> <li>Prepare and implement Occupational Health and Safety Management Plan.</li> <li>Provide safe and clean water for drinking, appropriate sanitary facilities such as portable toilets and waste bins.</li> </ul>
	Traffic	<ul style="list-style-type: none"> <li>Increase in traffic volume</li> </ul>	<ul style="list-style-type: none"> <li>Prepare and implement Traffic Management Plan.</li> <li>Create a committee that will ensure ease of circulation and implement loading and unloading areas.</li> </ul>
Generation and improper handling and disposal of domestic and hazardous wastes	Land value	<ul style="list-style-type: none"> <li>Devaluation of land value as a result of improper solid waste management</li> </ul>	<ul style="list-style-type: none"> <li>Strictly implement solid waste management plan and proper disposal by contractor in accordance with RA 9003, hazardous waste disposal in accordance with RA 6969.</li> </ul>
<ul style="list-style-type: none"> <li>Discharge of wastewater</li> <li>Accidental spills of fuels and lubricants</li> <li>Generation and improper handling and disposal of domestic and hazardous wastes</li> </ul>	Water quality	<ul style="list-style-type: none"> <li>Degradation of water quality</li> </ul>	<ul style="list-style-type: none"> <li>Comply with environmental permitting requirements for the storage, transport, handling, and treatment and disposal of hazardous material/ wastes in accordance with RA 6969.</li> <li>Conduct proper inspection and prompt maintenance of the installed wastewater treatment facilities.</li> <li>Compliance to RA 9275 including but not limited to securing of discharge permit.</li> <li>Conduct proper inspection and regular maintenance of drainage system and treatment facility.</li> <li>Conduct of quarterly water quality monitoring.</li> </ul>



**For more information and copy of EIS:**

Download the whole version of the EIS at <http://eia.emb.gov.ph/>. Click the banner of Notice of Public Hearing/Consultation then look for **NLEX-C5 (Segment 8.2) North Link Project**.