ENVIRONMENTAL IMPACT STATEMENT

DRAFT REPORT
DECEMBER 2023

RIVER RESTORATION PROJECT

THROUGH DREDGING ACTIVITIES

AT THE ALAG RIVER

Municipality of Baco, Oriental Mindoro

BIRD'S NEST RESOURCES CORPORATION

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I. EXECUTIVE SUMMARY

A. Project Fact Sheet

The Bird's Nest Resources Corporation (BNRC) plans to implement the proposed River Restoration Project through Dredging Activities in Alag River. BNRC is chosen by the Inter-Agency Committee as a pre-qualified proponent for the proposed river restoration project.

The proposed project is one of the river restoration projects for the Province of Oriental Mindoro identified in the IAC Resolution No. 02-2023 dated March 30, 2023.

The proposed project area covers the 1 km waterway (offshore) from the mouth of the Alag River and the river channel of Alag River starting from the river mouth up to 10 km upstream with 20 m buffer zone from the river banks.

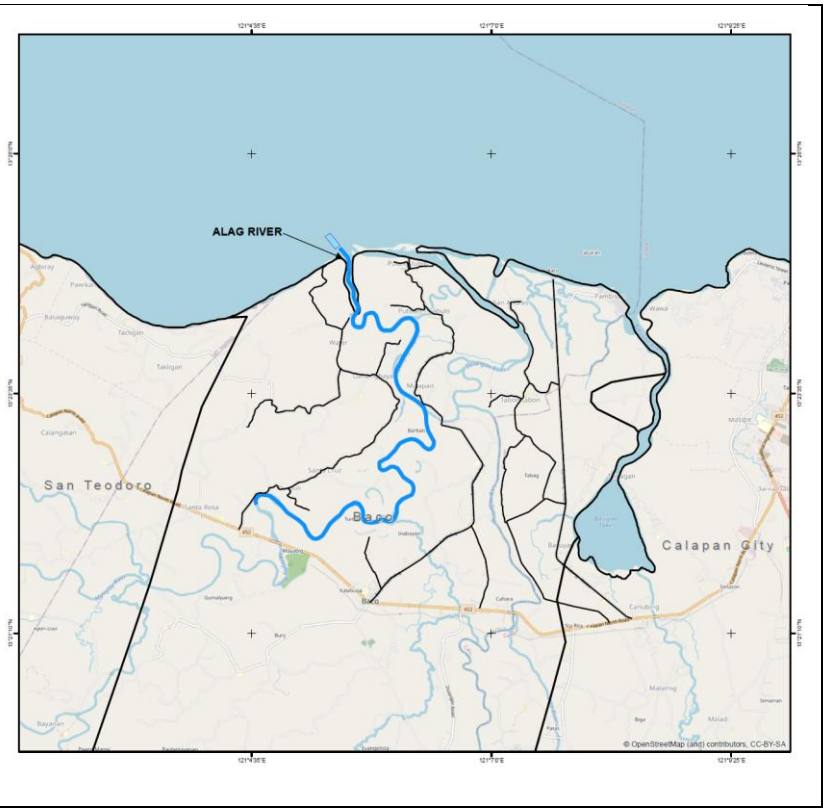


Table ES 1: Project Fact Sheet

Name of Project:	**River Restoration Project through Dredging Activities at the Alag River**
Project Location:	Barangays Water, Putican-Cabulo, Malapad, Burbuli, Poblacion, Catwiran I, Alag, Santa Cruz, Lumang-Bayan, Municipality of Baco, Orinetal Mindoro
Project Proponent:	**BIRD'S NEST RESOURCES CORPORATION**
Proponent's Address	402 Bencom Bldg. 146 West Avenue, Brgy. Phil-Am, Quezon City
Contact Person:	**ARCH. PHIL CHRISTIAN A. CASTRO**
Position/ Designation:	Project Architect
Contact No:	02 8529-6808, 0908-2961267
Project Size:	Total dredging area of approximately 80 hectares Total volume of dredge material is approximately 7 million m^3 Buffer Zone 20 m from river banks
Project Timeframe:	10 to 11 months with an extraction rate of 1.2 million m^3 per month.

B. Process Documentation of the Conduct of Environmental Impact Assessment (EIA)

The following activities were conducted for the application of ECC amendment for the proposed project.

Activity	Date / Time	Venue/Area
Public Scoping	June 2, 2023 / 9 am and 2 pm	Municipal Office of Baco
Technical Scoping	June 30, 2023 / 2pm	EMB Region 4B Office
Terrestrial Ecology Sampling	June 19 – 22, 2023	Alag River
Freshwater Ecology Sampling	June 19 – 22, 2023	Alag River
Water Sampling	June 18- 19, 2023	Alag River
Groundwater Sampling	July 19, 2023	Barangays of Water, Burburi, Malapad,
Noise Sampling	June 21, 2023	Alag River
Marine Survey	July 1 – 3, 2023	Alag River Delta
Public Consultation		

Two rounds of FGD were held at Baco Municipal Hall on June 2, 2023. The morning consultations with LGU representatives were led by the Municipal Mayor of Baco, Hon. Allan A. Roldan. The FGDs for the thirteen (13) barangays which are scheduled on the following days, have been adjusted on the same day as advised by Hon. Roldan. For such an activity, the LGU convened all Punong barangays and various representatives. The LGU's urgent request to conduct FGD with the barangays is consistent with their favorable feedback on the proposal and their eagerness to start the project as soon as possible.

The Public Scoping was facilitated by BNRC in both the morning and afternoon sessions. The presence of participants or representatives from various offices and sectors was initially acknowledged during the activities. The proponent expressed appreciation towards everyone who took the time to participate in the public scoping. Mr. Brando Bulosan, BNRC's Environmental Planner, then gave the activity's agenda and a technical description of the project. Ms. Anne Elizabeth Papa explained the EIA process in the morning, while Mr. Mark Anthony Abrenica (virtual) discussed the PEISS and relevant activities that will be undertaken for the EIA. The assigned presenters utilized visual presentations to facilitate the sharing of information among all the attendees.

Official invitation letters addressed to the thirteen (13) Punong Barangays and LGU-Baco were sent on May 31, 2023 to the respective offices. The invitation letter contains the objectives, schedule, and target participants of the proposed activity. Enumerated below are the specific sectors invited for the activity:

- Sangguniang Barangay Member- Committee Environment and Agriculture
- Sangguniang Barangay Member- Committee on Employment and Livelihood
- Fisherfolk/Farmer Associations

- Industries/Entities dependent on the river as primary source of income
- Active Civil Society Organization (CSO)
- Senior Citizen Sector
- Youth Sector
- PWD Sector

Issues and Concerns Raised During the Public Scoping

Module/Aspect	Issues and Concerns	Responses
Project Description	***Hon. Allan Roldan (Mayor, LGU-Baco)*** We want this project to be accomplished as soon as possible. You should be able to finish this project within 5–6 months prior to the start of the LGU's flood control project in 2024. Failure to do so may have an impact on the Flood Control Project's timeline and overall implementation. Securing the necessary permits from the DENR should be done immediately.	***Ar. Brando Bulosan (BNRC)*** Dredging is an immediate action that the citizens of Baco must take, especially now that the rainy season has started. We are all aware that conducting an EIA and obtaining an Environmental Compliance Certificate (ECC) from the DENR is a time-consuming process. Thus, a special resolution or a special permit from the Provincial Government must be secured in order to expedite the process.
	Hon. Allan Roldan (Mayor, LGU-Baco) We should meet with the barangay captains to come to an agreement on this project and expedite the process. The affected barangays, through the Association of Barangay Captains (ABC), should have a resolution, which will be discussed in the SB. This will be requested by the ABC, and the proponent, together with SB, should be present during the said meeting. We can do this once you provide us with the necessary documentation. Disseminate the information to the concerned barangays and request a meeting. To reiterate, we want to fast-track this project in order to avoid delays in the completion of our 2024 flood control project. Your project should be accomplished this year, so there will not be any delays in our project.	***Ms. Ahba Santos (BNRC)*** We have presented you with our schedule of barangay meetings. Will there be a special consultation with the Liga ng mga Barangay? It will take time for us to obtain the appropriate permits from the National Agency, but the need for dredging activities is urgent, and we are considering the situation of the affected barangays.

Module/Aspect	Issues and Concerns	Responses
	BNRC (Presenting the EIA process) By December of this year, the ECC would have been secured from the DENR.	***Hon. Allan Roldan*** ***(Mayor, LGU-Baco)*** The ECC should be secured as soon as possible. By July, you should have started dredging and be finished by October.
	BNRC Based on the suggested schedule, the EIA process should start immediately. As planned, we will conduct the consultations with the thirteen (13) barangays by tomorrow.	***Hon. Allan Roldan*** ***(Mayor, LGU-Baco)*** Instead of meeting with them individually (per barangay), I propose that we gather all of them here this afternoon. Our flood control project shouldn't be delayed any longer since the funds will be returned to the national treasury. At the LGU level, we will prepare all necessary documents. If you receive permission from the provincial government and the required permits or clearances from DENR, then no objection from the LGU is assured. Simply prepare the documentation you require, or we will need to inspect it at the local government level. Guidelines must be followed in order to expedite the project and prevent permit revocation. You should begin dredging as soon as possible so that the ground is firm by the time we undertake the flood control project. ECC would be simple to secure; all we ask is that you do it quickly. All we need to know is how far your dredging activities will be from our infrastructure project.
Water	***LGU Personnel (1)*** You will be obtaining two (2) permits: offshore and inland. San Andres is a Marine Protected Area (MPA) in Longos with a fish sanctuary. ***Hon. Allan Roldan*** ***(Mayor, LGU-Baco)***	***Lynnette Lyzelle S. Ferrer (BNRC)*** Our freshwater and marine ecology consultants will propose mitigation methods for the perceived impacts during the preparation of the EIS.

Module/Aspect	Issues and Concerns	Responses
	Sedimentation/siltation would have an apparent impact on fishes, particularly in our sanctuary.	
Project Description	***LGU Personnel (2)*** Is there a standard for the depth and width for the dredging activities? ***Hon. Allan Roldan (Mayor, LGU-Baco)*** What is the distance of the stationing? Please check the area.	***Engr. Sherwin Maiso (BNRC)*** The standard distance between two locations is 50 meters. The project would start about 10 meters from the riverbank. The project ought to focus on the middle of the lakes because that is where the largest amount of sand is found. There would be a 10-meter buffer zone.
	LGU Personnel (3) How many hectares or volume?	***Hon. Allan Roldan (Mayor, LGU-Baco)*** There should be an actual study of the project site. The project engineer should be overseeing the project site constantly.
	LGU Personnel (4) You are about to secure an ECC. The ECC requires a zoning certificate. The payment would be 720 pesos per hectare. We will require you to pay such amount for both inland and foreshore. Please include the kml and shape files in your submission. If these are submitted, there will be no complaints from our end.	***Engr. Sherwin Maiso (BNRC)*** This is well noted.

Summary of Issues and Concerns during the FGD with the Covered Barangays (PM)

Module/Aspect	Issues and Concerns	Responses
Project Description; People; Water	***Hon. Arlene Pereña (SB, LGU-Baco)*** Could you please tell us about your previous projects? It is important to highlight that proper disposal of sediments is a crucial aspect of dredging projects. Previously, our experience with other	***Ar. Brando Bulosan (BNRC)*** We have already partnered with an international company. We hope for a strong commitment and that the project will be executed according to plan. We do due diligence, and it is essential to ensure that all parties involved are dedicated to the successful completion of the project.

Module/Aspect	Issues and Concerns	Responses
	companies was that sediments were simply stockpiled in our barangays. After the contract signing, what mitigating measures will be implemented to address any potential impacts? We need assurance that after the dredging, mitigating measures will be in place for safety purposes.	It is worth exploring the possibility of providing assistance to affected residents. This could be discussed further with the relevant authorities and stakeholders to determine the feasibility and appropriate measures to support the affected community during the project's implementation. There is a law stating that the government authorities, from the governor down to the barangay officials, would receive 50% of the project's profits. Mitigating measures are vital to minimizing any negative impacts that may arise during and after the project. These measures can include regular monitoring of environmental parameters, implementing erosion and sediment control measures, ensuring proper waste management practices, and restoring affected areas to the natural course of water flow. A comprehensive environmental management plan would be developed and followed to address any potential environmental concerns and ensure sustainable outcomes. Remember, these responses are not the final decision, as we will be sampling on our own as well, aside from the DPWH, DILG, DENR, and DENR-EMB proposals. It's important to consult with experts from the municipality and relevant authorities to tailor the approach and measures based on the specific project requirements and local regulations, which is why we are having these meetings.
Project Description	***Hon. Victor Valenzuela (SB, LGU-Baco)*** Will there be a memorandum of agreement (MOA) in place for this project? It is important that aggregates be handled properly. We must verify that they are managed in accordance with	***Ar. Brando Bulosan (BNRC)*** Yes, Councilor Valenzuela, a memorandum of agreement outlining the responsibilities, commitments, and guidelines for the project, particularly for the community, is recommended. This MOA ensures that all parties involved are aligned and aware of their obligations.

Module/Aspect	Issues and Concerns	Responses
	the terms of the MOA, as a previous company simply stockpiled their dredged materials in our municipality. We need to emphasize that there should be no stockpiling of aggregates without a designated end-use. This will help prevent unnecessary environmental impacts and ensure that the project proceeds smoothly.	Absolutely, Councilor Valenzuela. The MOA should explicitly state the proper handling and management of aggregates. It is important that the agreed-upon terms and conditions are developed by the joint project proposal of DPWH, DILG, DENR, and DENR-EMB. That is correct, Councilor Valenzuela. The MOA should include provisions that the aggregates have a designated end-use in place, which is in Manila Bay.
	Hon. Jay A. Nasito ***(SB, LGU-Baco)*** Expedite this dredging project as the communities expect it to be the solution to the flooding in the area.	***BNRC*** This is well noted.
	Hon. Severina Jimenez ***(SB, LGU-Baco)*** Be sure to finish the project, unlike the previous ones.	
Water	***Hon. Danilo Salome*** ***(PB, Barangay Malapad)*** Will the natural flow of the river be affected?	***Ar. Brando Bulosan (BNRC)*** No. The natural course of the water will remain the same. It is only the sand that will be extracted.
	Hon. Armando A. Perez ***(PB, Barangay Catwiran I)*** Will all the sand be extracted? If the sand is extracted, will the floods be reduced?	***Ar. Brando Bulosan (BNRC)*** **No.** There will be no change in the natural topography of the river. ***Hon. Allan Roldan*** ***(Mayor, LGU-Baco)*** No. This dredging will just help. We must wait for one to two months for the LGU's flood control project.
	Hon. Victoriano Zulueta ***(PB, Barangay San Andres)*** Will the dredging include the mouth of the river? What if there is an island formed in the river mouth? Will that be dredged?	***Ar. Brando Bulosan (BNRC)*** Yes, if that is declared hazardous, it will be extracted. A collection of sand formed is not a natural island; therefore, it should be extracted for the safe navigational lane.

Module/Aspect	Issues and Concerns	Responses
	If others have doubt, I have fear. What will happen after two (2) years of dredging operations? That is my fear.	Thank you, Kap. Based on our research, you have a sunken town here. Please do not know that we are not just into quarrying. Also, you mentioned that there are fault lines to consider. Kindly give us information so we can have it integrated into our study.
	Hon. Maynard Cueto ***(PB, Barangay Pulang-Tubig)*** We are enclosed by the Alag and Longos Rivers. What will happen to our barangay if there is flooding? What will happen to us? ***Hon. Allan Roldan*** ***(Mayor, LGU-Baco)*** His area is estuarine. The barangay is being protected by that island in the riverbed. What will be the depth of your boring test?	***Ar. Brando Bulosan (BNRC)*** We will find out where the hardest sand is. Only the top sand will be dredged.
	Hon. Marietta Castillo ***(PB, Barangay Putican-Cabulo)*** The natural course of the river has changed. An island is formed in the center of the river. What will happen to those living there	***Ar. Brando Bulosan (BNRC)*** We will avoid them if they have a title.
	Hon. Maynard Cueto ***(PB, Barangay Pulang-Tubig)*** What will happen to us with the amount of water that the flood may bring? We need a protective dike.	***Hon. Allan Roldan*** ***(Mayor, LGU-Baco)*** We need to fast-track this dredging activity to prevent flooding. We should prepare a resolution immediately.

The EIA team is composed of the following:

Name	Module/Specialization
Engr. Rainier D. Reyes	Peer Reviewer, Water Quality
Mark Anthony E. Abrenica	Socio-Cultural, Economic and Political Environment
Yves Christian L. Cabillon	Plankton Specialist and Marine Team Leader
Lawrence Robles	Marine Specialsit
Jan Paolo T. Pollisco	Terrestrial Flora and Fauna Freshwater Ecology

C. EIA Summary

Discussion on No Project Option

The No Project Option suggest that no dredging is considered as an option to avoid potential environmental impacts of the proposed project. The purpose of the proposed project is to alleviate flood hazards to the surround communities of the Alag River. River dredging was identified as a safety measure that can reduce water levels in flooding events. With the No Project Option, the Alag River will continue to be heavily silted and the flooding events may not be lessened.

Baseline Summary and Assessment and Mitigation

Environmental Component		Baseline Characteristics, Assessment and Mitigation
Land	Land Use/Land Classification	The municipality of Baco has a total land area of 38,263.70 hectares. According to MPDO, more than half of the total land area (65 percent) is classified as forestland, while alienable and disposable land comprises 31.32 percent of the total land area. The project area is compatible with the Comprehensive Land Use Plan (2018-2028) of the Municipality of Baco. A certification was issued to BNRC by the Municipal Planning and Development Coordinator on July 17, 2023.
Water	Hydrology	The project area is covered by the Alag-Baco Watershed. The head waters of Alag River are from the mountainous area of Baco and San Teodoro. About 17,710 ha of the watershed is covered by the Baco Municipality. The Alag River traverses the western part of the watershed. The sediments along the rivers are composed of silt and sand-sized sediments with almost no pebble or large particles.
	Water Quality	Results of ambient water quality analysis indicate that the surface water has high fecal coliform. FW2 and FW3 sampling stations have total suspended solids that exceeds the Water Quality Guidelines (WQG) value. The BOD values of FW2 and FW3 exceed the WQG except for FW1 (Brgy. Water). Oil and grease values for all stations are within the WQG. The result of analysis for groundwater quality sampling shows that all stations except GW4 have Oil and Grease that exceeds the WQG of 1 mg/L for Class A. Fecal coliform results also exceeds the WQG. All other parameters are within the WQG. The result of analysis for marine water quality shows that fecal coliform is within the WQG of 200 MPN/100mL for Class SC water body except for station MW2 with value of 1300 MPN/100mL. BOD results for all stations are within the WQG of 7 mg/L. All other parameters are within the WQG. Monthly monitoring of TSS and Oil and Grease will be conducted during operations. Used oil shall be properly stored and disposed through DENR accredited TSD.
	Freshwater Ecology	Freshwater ecology survey was conducted on June 19-22, 2023 at the Alag River. 2 sampling stations were established upstream and downstream of the river. A total of nine phytoplankton taxa belonging to four divisions were recorded during the survey. The divisions were Chlorophyta which is the most abundant, Cyanophyta, Bacillariophyta and Rhodophyta. No zooplankton were observed at the sampling stations.

Environmental Component		Baseline Characteristics, Assessment and Mitigation
		Based on the Oriental Mindoro Integrated Management Plan (2018), the most abundant fish species is tilapia followed by carps and mudfishes while the major marine species caught in 2013-2016 are frigate tuna, sardines and round scads.
	Marine Ecology	Marine survey was conducted on the proposed waterways and adjacent areas. The result of the survey shows that two main groups of phytoplankton were observed: Bacillariophyta and Cyanophyta in the study area. The phytoplankton community in all sampling stations can be described as less diverse, with only a maximum number of taxa at 4. The zooplankton recorded in sampling stations in belong to Phylum Arthropoda. Manta tow was conducted as a rapid assessment method to characterize the survey area and identify critical marine habitats present. Seagrass was present in stations of Alag River and Longos River but absent in between rivers. Alag River site is dominated by a single species of seagrass (Halodule uninervis). Manta tow results along the stations showed no presence of coral reefs. Monthly monitoring of TSS and Oil and Grease will be conducted in the marine during waterway dredging. Used oil shall be properly stored and disposed through DENR accredited TSD. Silt curtain maybe used if excessive suspended sediments are observed during operation.
	Ambient Noise	Results of ambient noise monitoring show that all stations were within the standard. Ambient noise monitoring was conducted in the barangays of Water and Lumangbayan.
People	Demography	Baco is a coastal, third-class municipality situated in the northern portion of the province of Oriental Mindoro. It is composed of 27 barangays with a total land area of 31,126.02 hectares, which constitutes 5.10% of the province's total land area.
	Income and Employment	The project area is offshore and within the river channel. Therefore, there will be no displacement of settlers. A temporary influx of workers can be expected during the operation phase of the Project, which may lead to the proliferation of informal settlers in the impact barangays. To ensure maximum benefit for the host community, it is recommended to the Proponent or its contractors to prioritize qualified local residents as their workers (of any type) during project implementation. The proponent will encourage migrant workers to participate in social activities and social development programs to interact with the community. On the other hand, coordination with the barangays and LGU will be undertaken to monitor and prevent the encroachment of informal settlers within the vicinity.
	Health Resources	The Baco Rural Health Unit (RHU), located in Barangay Poblacion, generally caters to the public's health concerns through the services provided by healthcare personnel such as doctors, nurses, midwives, sanitary inspectors, and other health workers. As of 2017, only three out of 27 barangays in Baco have established Barangay Health Stations (BHS). The rest of the barangays utilize their multipurpose halls and other barangay facilities for health-related activities and projects. The proposed project is not expected to affect public health and safety negatively.

Environmental Component		Baseline Characteristics, Assessment and Mitigation
	Access to Basic Services	The proposed project is not expected to affect access to transportation negatively. The project operation will not need water and power supply from the project area except for its site office.

Summary of alternatives considered

Alternative sitings are considered for the delineation of the river dredging zone (RDZ) along the Alag River. Among the criteria for selection is the presence of structures such as bridges, susceptibility of the area to landslide and possible impact to marine and freshwater flora and fauna.

The RDZ at the Alag River was determined to be 10 km river channel starting from the rivermouth. The end of the RDZ was established 500 m from the existing bridge in Brgy. Alag.

Concise Integrated Discussion on the Ecological Profile and Carrying Capacity of the Proposed Project Site

The project area is covered by the Alag-Baco Watershed. The head waters of Alag River and Longos River are from the mountainous area of Baco and San Teodoro. About 17,710 ha of the watershed is covered by the Baco Municipality. The Alag River traverses the western part of the watershed while the Longos River runs along the eastern part of the watershed. The two rivers are interconnected downstream by narrow rivers and creeks.

Since the objective of the project is to alleviate the flooding along the impacted barangays of Baco, dredging of the Alag River is proposed. Based on the Dredging Plan approved by the DPWH, the total sediments to be dredged is estimated at 7 million m^3. The river channel to be dredge will start from the rivermouth up to 10 km upstream. A waterway will also be dredged to serve as navigational way for the dredging equipment. The waterway will start from the rivermouth extending 250 m to the coastal waters.

The impact of the dredging activities on coastal water is the removal of sediments. Subsequently the removal of sediments will entail the removal of seagrasses and other organism on the sediment. This impact is temporary and only within the project site. The duration of the actual dredging operation is estimated at eight (8) months and the whole project duration is about 10 to 11 months. This dreding project is short-termed unlike other projects such as sand quarry which takes a number of years to complete. That is why determining the carrying capacity of the project site for this kind of long-termed project is important.

Other impacts include limited access to the project site which is the portion of the river channel being dredged. This impact is also temporary and access is allowed along the 20m buffer zone.

The carrying capacity was determined using RUSLE. The soil loss estimation was conducted to the watershed that covers the project area. Based on the result of the model, the estimated value of soil loss in the mountainous area ranges from 10 to 10,000 tons/ha/yr. While the low-lying areas have estimated soil loss of less than 1 to 100 tons/ha/yr.

Based on the approved DPWH Dredging Plan the maximum sediments to be dredged is 40,000 cubic meter per day or 64,000 tons per day and equivalent to 19.2 million tons per year. Applying the soil loss estimated value, the soil loss for the watershed is estimated at 177 million tons per year.

Summary of the Environmental Management Goals and Indicator Limits for Water Quality

The main impact of dredging activities is increase in turbidity of surface water. The maximum allowable limits of DENR guidelines for TSS are 80 mg/L for Class C water body. The ambient TSS of the rivers already exceeds the guidelines which is evident by the heavily silted condition of the rivers.

Turbidity plume generation that may cause degradation of water quality can be prevented or mitigated by the following:

- For the dredging equipment: installation of green valves, recycling (part of) overflow water, using overflow with a bottom exit, or reducing the overflow.
- Use silt curtains to reduce spread of suspended sediment from dredging operations or protect a habitat
- Filter the overflow effluent from transport barges to reduce sediment loss, suspended sediment and turbidity
- Restrict the dredging operations to certain tidal conditions (flood/ebb, spring/neap) or avoid operations during tidal extremes
- Operation to be scheduled during dry season if possible to reduce turbidity migration to coastal waters;
- Coordinate with other operators regarding minimizing dredging operation if increased turbidity is observed in the coastal areas;

D. Key Environmental Impacts Management and Monitoring Plan

Impact Management Plan

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Type of Impact	Options for Prevention for Mitigation or Enhancement	Responsible Entity	Cost (PHP)	Guarantee / Financial Arrangement
I. PRE-OPERATION PHASE							
Mobilization of Dredging Equipment	People	Navigational Traffic	• Reversible	• Acquisition of permits • Conduct Social Preparations • Posting of notices	BNRC LGUs	• Part of construction cost	Included in the project development and implementation
II. OPERATION PHASE							
Dredging	Water Quality	• Turbidity plume generation (suspended sediments) that may cause degradation of water quality	• Reversible	• Installation of green valves, recycling (part of) overflow water, using overflow with a bottom exit, or reducing the overflow.	BNRC	• Part of operation cost	Included in the project development and implementation
		• Presence of oil and grease from machineries that may cause degradation of water quality	• Reversible	• Quarterly water quality monitoring • Conduct proper inspection and prompt maintenance of machines and equipment, and facilities	BNRC	• Part of operation cost	
		• Erosion of river banks	• Irreversible	• Implement the approved Design Plan which may include river bank protection • Observe limits of buffer zones	BNRC	• Part of operation cost	
		• Water pollution due to improper disposal of solid waste from dredging vessels	• Reversible	• Implement proper collection, segregation and disposal of solid waste;	BNRC	• Part of operation cost	

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Type of Impact	Options for Prevention for Mitigation or Enhancement	Responsible Entity	Cost (PHP)	Guarantee / Financial Arrangement
	Marine Ecology	• Turbidity plume generation (suspended sediments) • Threat to abundance, frequency and distribution of species	• Reversible	• Operation to be scheduled during dry season if possible to reduce turbidity migration to coastal waters; • Coordinate with other operators regarding minimizing dredging operation if increased turbidity is observed in the coastal areas;	BNRC IAC LGUs	• Part of operation cost	IAC Arrangements
	River Ecology	• General habitat damage/loss in the dredge area and hydraulic entrainment • Disturbance of navigation routes	• Reversible	• Aside from following strictly the general good practices in dredging, here are some specific to the area: • Dredging time and location be scheduled to allow temporary shelter/refuge areas. • Scheduling location of dredging, one-side only at a time for example, to provide a sort of navigation route. This navigation route should be relatively free of major route barrier in the water column • On the socio-economic side, compensation for loss of fishery opportunity should be considered • Monitoring database on water quality covering standard parameters for Class C waters	BNRC IAC LGUs	• Part of operation cost	IAC Arrangements
		• Noise generation	• Residual	• Minimize dredging activities during night time especially in areas within hearing distance from existing communities • 200m buffer zone should be observed to minimize noise level at the community near the river bank. • Use of proper Personal Protective Equipment (PPE)	BNRC	• Part of operation cost	IAC Arrangements

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Type of Impact	Options for Prevention for Mitigation or Enhancement	Responsible Entity	Cost (PHP)	Guarantee / Financial Arrangement
• Removal of fishnets and boat docking area of fisherfolks	• Fisher folks	• Disturbance of livelihood • Loss of income	• Residual	• Prepare and implement livelihood and income restoration for PAF's whose present means of livelihood is no longer viable and will have to engage in new income activity. • Conduct and implement Social Development Plan (SDP)	BNRC	• To be included in the SDP budget	Approved SDP
II. ABANDONMENT PHASE							
Demobilization	Land and Water	Adverse environmental footprint	Reversible	Follow closure and abandonment procedures/ policy	BNRC	Part of Mobilization	Part of Mobilization

Environmental Monitoring Plan with EQPL Management Scheme

Project Phase / Environmental Aspect	Potential Impact per Environmental Sector	Parameters to be monitored	Phase	Sampling and Measurement Plan			Lead Person	Annual Estimated Cost (PHP)	EQPL Management Scheme					
				Method	Frequency	Location			EQPL Range			EQPL Management Scheme		
									Alert*	Action**	Limit	Alert*	Action**	Limit
The Land	Coastal Erosion/ deposition	Change in coastline configuration	Operation	Ocular spotting	Semi-annual	River mouth	BNRC	30,000	N/A	N/A	N/A	N/A	N/A	N/A
The People	Noise	Decibels (A)	Operation	Sound Meter	Monthly	River banks	BNRC	50,000	Complaints	Resolve complaints	Implement corrective action as necessary	Complaints	Resolve complaints	Implement corrective action as necessary
	Navigational Traffic	No. of fishers affected	Operation	Log Book	Monthly	Municipal Waters	BNRC	50,000	Complaints	Resolve complaints	Implement corrective action as necessary	Complaints	Resolve complaints	Implement corrective action as necessary
The Water	Increase in turbidity	TSS	Operation	Secchiu disk	Monthly	River channel	BNRC	20,000	60 mg/l	70 mg/l	80 mg/l	Investigate source and implement corrective action if necessary		
	Presence of oil and grease from machineries	Oil and grease	Operation and Abandonment	Water Quality Test	Quarterly	River channel	BNRC	50,000	1.6ppm	1.8ppm	2ppm	Investigate source and implement corrective action if necessary		

1 PROJECT DESCRIPTION

1.1 Project Location and Area

1.1.1 Project History

In order to protect and properly manage the disposition of sand as well as restore the natural stated and water flow of the heavily-silted river channels in the Province of Oriental Mindoro, the DENR Administrative Order (DAO) No. 14-2019 re: Rationalizing Dredging Activities in the Heavily-Silted River Channles within the Province of Oriental Mindoro Pursuant to the DENR-DPWH-DILG-DOTR Joint Memorandum Circular No. 1 series of 2019 was issued on November 4, 2019. DAO 14-2019 was then modified through DAO No. 07-2020 on February 27, 2020.

On March 30, 2023, the Inter-Agency Committed issued the IAC Resolution No. 02-2023 which identified the river systems recommended for large scale dredging activities. The recommended river systems include the Cluster of Alag River and Longos River in Baco, Oriental Mindoro. The resolution invited interested proponents willing to undertake River Restoration through Large-Scale Dredging Activities to submit letter of intent and proof of financial capacities.

Consequently, the Provincial Administrator's Office of the Province of Oriental Mindoro issued a Notice to the Public on March 31, 2023 informing the public that the Provincial Government of Oriental Mindoro (PGOM) is accepting proposals from private sector proponents.

The Bird's Nest Resources Corporation (BNRC) submitted its proposal and was conferred the status as a pre-qualified proponent to undertake the river restoration project. A certificate was issued by the PGOM to BNRC on May 17, 2023. The certificate stated that the IAC authorized BNRC to conduct public scoping and to submit the draft Dredging Master Plan within sixty (60) days from the issuance of the said certificate.

This Environmental Impact Assessment Report is prepared for the Environmental Compliance Certificate Application for the proposed project.

1.1.2 Accessibility of Project Site

The project is accessible via a 2-hour road travel from Manila on the South Luzon Expressway and Southern Tagalog Arterial Road going to Batangas Port, then via sea vessel going to Calapan port. From Calapan City, the project area is about one hour land travel via Calapan North Road (**Figure 1-1**).

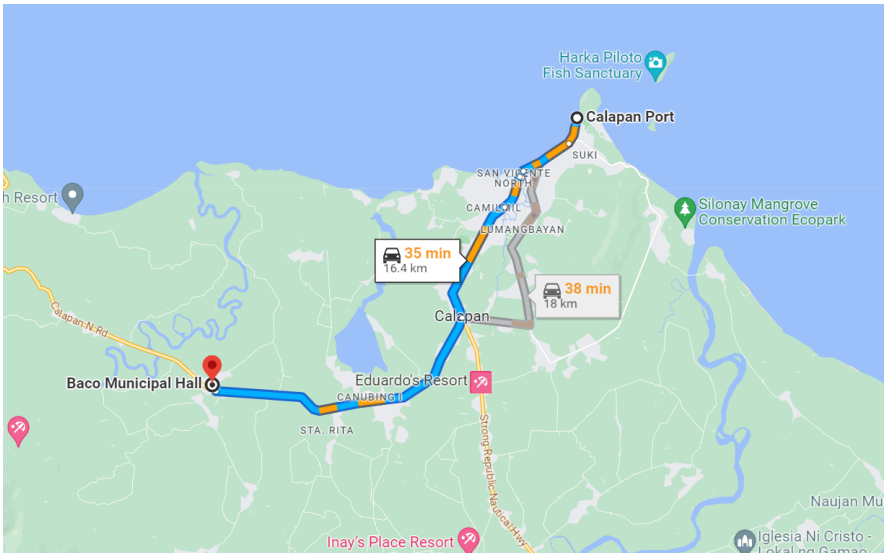


Figure 1-1: Project Site Accesibility

1.1.3 Project Location

The River Restoration Project involves the restoration of the river from the river mouth up to 10 km upstream. The river mouth of Alag River is located at Barangay Water under the Municipality of Baco in the Province of Oriental Mindoro. Other barangays covered by the project area is shown in Table 1-1. shows the location map of the proposed project.

Table 1-1: Project Location

Project Location	Barangays Water, Putican-Cabulo, Malapad, Burbuli, Poblacion, Catwiran I, Alag, Santa Cruz, Lumang-Bayan, Municipality of Baco, Orinetal Mindoro
Geographical Coordinates	See Annex 1

1.1.4 Primary and Secondary Impact Areas

1.1.4.1 Protected Areas

The Protected Areas proximate to the project area are:

Protected Area	Legal Basis	Legal Status	Approximate Distance from Proposed Project
Naujan Lake National Park	Proclamation No. 335 s. 1968	Initial Component	40 km
Mangrove areas along banks of: a. Mamburao River, b. Buluangan River to Lagarum River, Naujan, c. Bank of Betel Creek, d. Sablayan Pt. to Bagong Sabang River, e. Labangan to Calalayuan Pt. f. Suko River, g. Casiliga River, h. Island of Soguicay	Proclamation No. 2152, s. 1968	Initial Component	a. 56 km b. 23 km c. 55 km d. 70 km e. 123 km f. 89 km g. 48 km h. 123 km
Mt. Iglit-Baco National Park	Proclamation No. 557, s. 1969	Legislated	67 km

1.1.4.2 RAMSAR Sites

There are no declared RAMSAR sites in the Province of Mindoro. Figure 1-2 shows the location of the Protected Areas in relation with the Project Area.

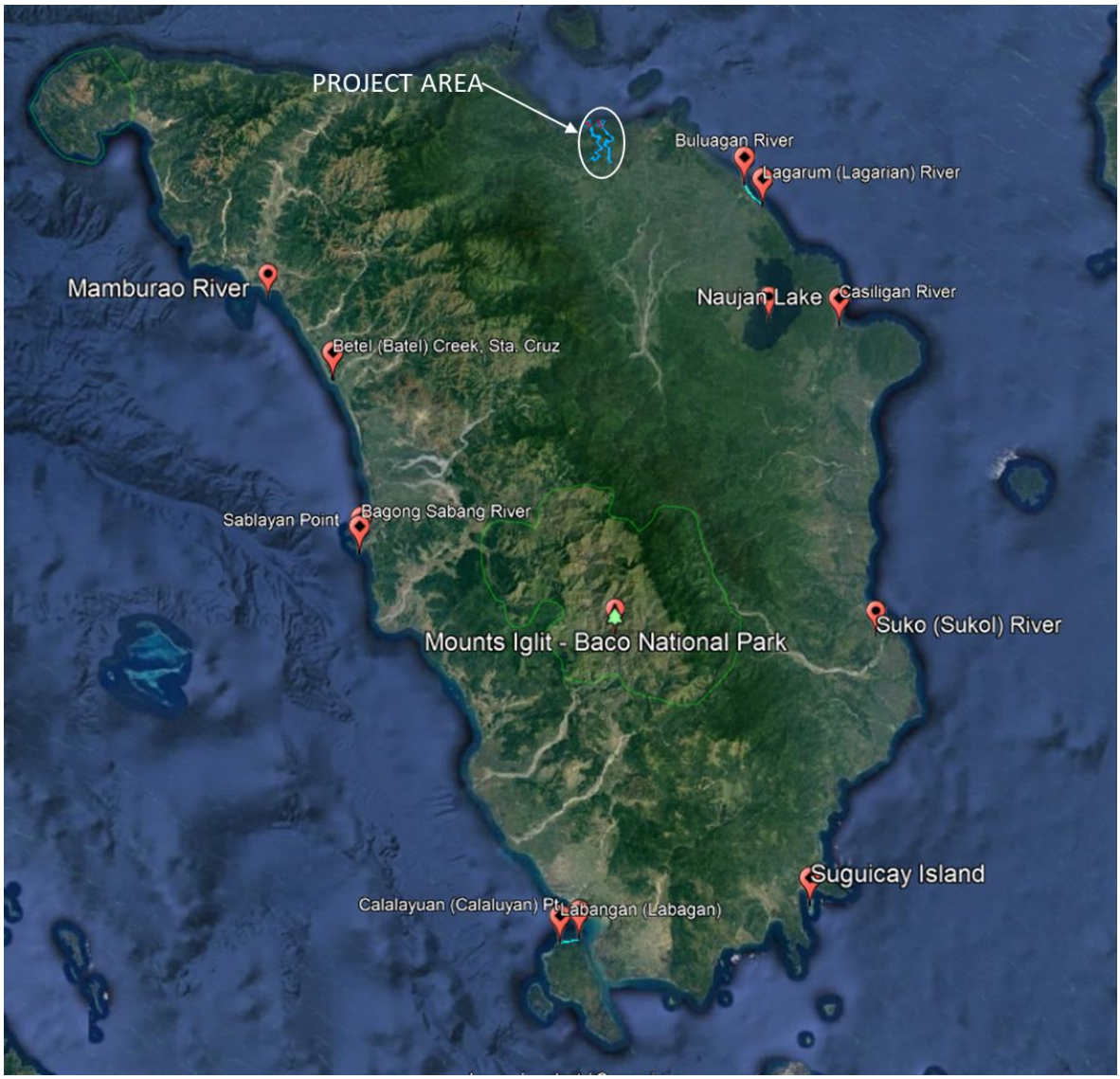


Figure 1-2: Map of Protected Areas

The primary impact areas are the portions of the Alag River 10 km upstream from the river mouth. The 250 m waterway of Alag River located at the river deltas are part of the primary impact area.

Secondary impact areas include the vicinity of such facilities. The map of direct and indirect impact area is shown in **Figure 1-4**.

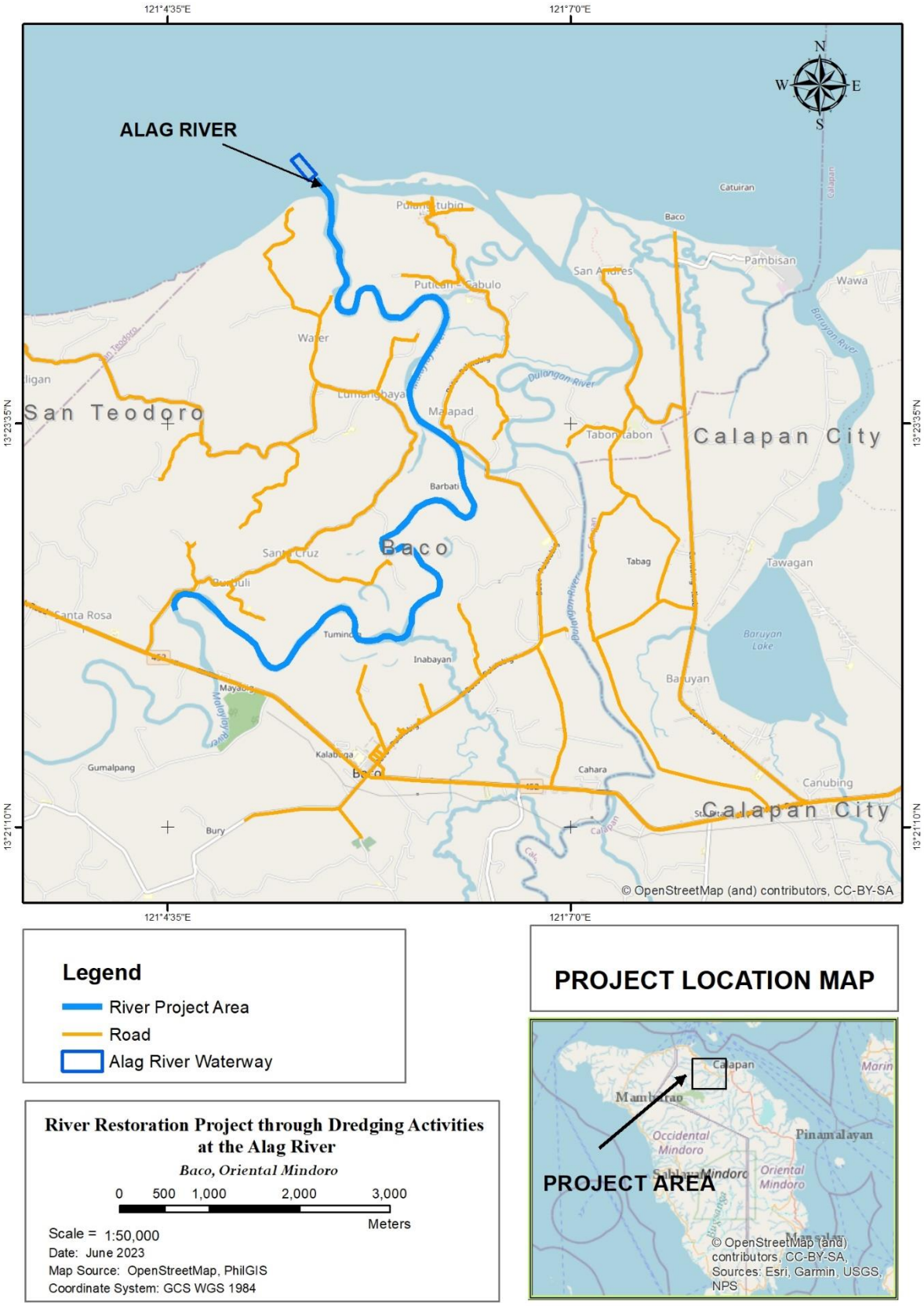


Figure 1-3: Location Map of the Project Site

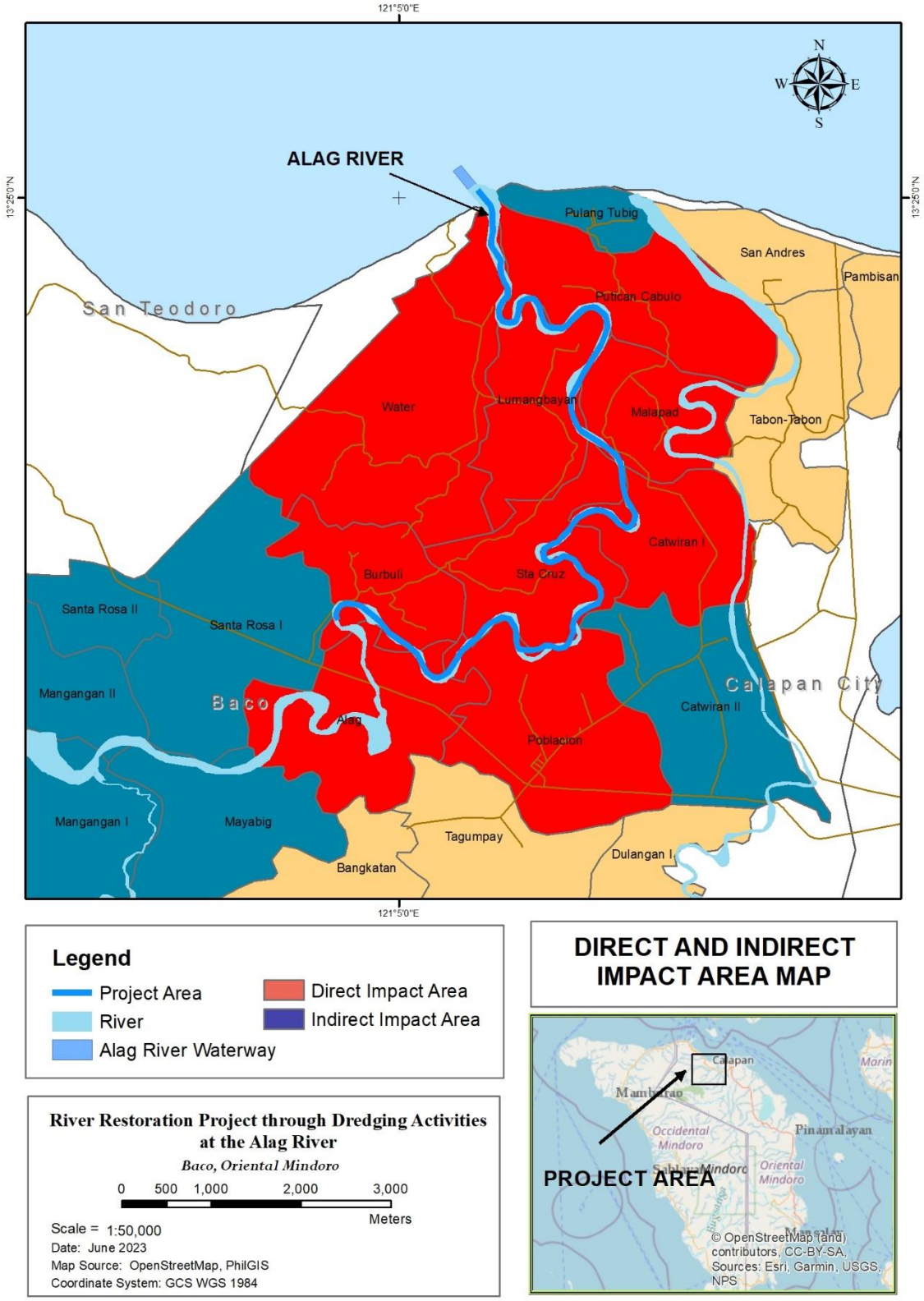


Figure 1-4: Map of Direct and Indirect Impact Area

1.2 Development Framework

The Department of Environment and Natural Resources issued Administrative Order No. 2019-14 (DAO 2019-17) dated November 4, 2019, Rationalizing Dredging Activities in Heavily Silted River Channels within the Province of Oriental Mindoro Pursuant to the DENR-DPWH-DILG-DOTR Joint Memorandum Circular No. 1 Series of 2019 (Annex 2).

Item I. Section 2 of DAO 2019-14 prescribes that in order to open heavily-silted river channels of Oriental Mindoro, the areas starting from coastline of river deltas extending all the way upstream, as may be determined by the Provincial Government in accordance with the DPWH Dredging Master Plan, are hereby declared as exclusive River Dredging Zones (RDZ). Hence, The Department of Public Works and Highways Region IV-B prepared the Master Plan and identified the RDZ for river dredging projects at the cluster of Alag River and Longos River in Baco, Oriental Mindoro.

The Inter-Agency Committee (IAC) issued a resolution on March 30, 2023 opening the submission of letters of intent, and proof of financial and technical capacities of interested applicant for Longos River, Alag River, Subaang River, Wasig River, Cagankan River, Mansalay River, Pula River Maujao River and Cawacat River (Annex 3).

The Provincial Government of Oriental Mindoro (PGOM) released a notice to the public on March 30, 2023 (Annex 4) pursuant to the provisions of DPWH-DENR-DILG-DOTr Joint Memorandum Circular No. 1, Series of 2019; and the Inter-Agency Committee (IAC) on Rationalizing Dredging Activities in the Heavily Silted Rivers Channels within the Province of Oriental. The notice stated that the PGOM is now accepting proposals from private sector proponents who are willing, and financially and technically capable to undertake river restoration, through large-scale dredging activites in the said river systems.

In this regard, BNRC submitted its proposal to the IAC and was issued a certification by the Provincial Government of Oriental Mindoro that the said company has been conferred the status as pre-qualified proponent to undertake River Restoration through dredging activities in the Cluster of Alag River and Longos River. The certification is prented in Annex 5.

Alag River and Longos River is among those river systems heavily silted with sand, mud and gravel materials coming from the mountains of Halcon in the Province of Oriental Mindoro. Currently, no temporary docks nor flood control embankments have been built by the government for the river or its estuary. According to on-site inspections of the river estuary, the river is severely clogged, which is unfavorable for drainage. It requires immediate desilting and dredging to improve the conveyance capacity of the river and to ensure that there will be no occurrence of waterlogging that could cause substantial damage to lives and properties of residents living in the area. Figure 1-5 the river site condition.

The main objective of the proposed project is to clear the Alag River of sediments down to its design depth for flood control and for the local government of Baco to implement its river control projects along the proposed project area.

Figure 1-5: Aerial view of Alag River Delta

1.3 Alternatives

1.3.1 Siting

There were no other sites considered for the project. The project locations were based on the studies condected by the Mines and Geosciences Bureau Revion IV-B on the identified River Dredging Zones (RDZs) in the Province of Oriental Mindoro.

1.3.2 Technology Selection

The dredging operations will utilize the Cutter-Suction Dredging Method – Self Propelled Pelican Barge. The cutter-suction dredger (CSD) is both self-propelled vessel and stationary dismountable vessel equipped with a rotating cutter head. The powerful cutter suction dredger is used mainly in dredging rock, clay, silt and sand. It is being normally deploys in the construction and maintenance of ports, land reclamation and coastal defenses, and riverbank protection and in dredging trenches for pipelines.

1.4 Size, General Water Use and Components

1.4.1 Project Size

Based on the Dredging Master Plan, the length of the channel and waterway of the RDZ in the Alag River is 10,000 m and 250 m respectively. The total volume of dredged material is approximately 7 million cubic meters.

Table 1-2 shows the summary of length and volume of dredged material.

Table 1-2: Summary of Project Size

Alag River	Length (m)	Volume (cbm)
Waterway	250	94,304
Channel	10,000	6,645,530
TOTAL		6,739,834

1.4.2 General Water Use

The project will require water source for its site office. The water source will be sourced from the local water source (groundwater) and only intended for domestic use. The operation is not expected to severely compete for water use with the host community.

The river is sometimes used for access, fishing, and boating. The river is not mainly used for access since the municipality has developed road network.

1.4.3 Power Sources

Power requirement of the project operation will be provided by the diesel engines of the dredger and barge. Howerver the site office will require electric power that will be sourced from the local cooperative. Back-up generators may be present when necessary for use in case of power outage.

1.4.4 Project Components

The summary of project components is presented in Table 1-3. The project will not utilize a stockpile area because the dredged materials will be hauled directly to designated end-use in the Manila Bay.

Table 1-3: Summary of Project Components

Component	Description
Dredging Vessel	Cutter-Suction Dredger with dredging capacity of 40,000 m^3/day
Hauling Barge	Self-Propelled Pelican Barge with 5,000 m^3 capacity (8 units).
Other support facilities and equipment	Field office, generator set (150kVa)
Pollution Control Devices	Silt curtains

The proponent will rent an office space for its field office. The field office will be located at Barangay Catwiran II, Baco, Oriental Mindoro.

1.4.5 Dredging Activity

The dredging activity will start at the waterway 250m from the river mouth. The waterway will serve as navigational access for the dredging equipment to the river mouth. Once the design depth is achieved for the waterway, dredging of the river mouth will commence and continue 10 km upstream.

All equipment will be coming from offshore to the project site. There will be no land area to be developed since no structure will be constructed.

1.5 Schedule of Dredging

Table 1-4 shows the proposed project schedule. The compressed schedule of activities reflects the urgent need for the project to alleviate the flooding problem in the province.

Table 1-4: Rate of Extraction and Timetable

Activity	Schedule
1. Mobilization and Site Preparation	1 month
2. Dredging Activities - river delta - river system	 1 month 7 months
3. Demobilization	1 month

The river delta which has total dredging quantity of 94,000 cubic meter will be completed in less than a month based on 25 days dredging operation per month with dredging capacity of 40,000 cubic meter per day. While the river system will be completed in 7 months by having an extraction rate of 1 million cubic meter per month based on 25 days operation per month.

1.6 General Stages fo Development and Activities

1.6.1 Pre-Operation Phase

This phase includes securing of other permits, tender of contracts and equipment and personnel acquisition.

The proponent will provide all labor and equipment costs necessary to move personnel, equipment, supplies and incidentals to and from the project site, establish its field office and other facilities

necessary for the work, obtain bonds, required insurance, government permits and clearances and other pre-construction expenses necessary for the smooth implementation of the project.

The dredge equipment shall be subject to inspection by the DPWH and a representative from the Provincial Government of Oriental Mindoro prior to actual dredging activities to ensure that it is in satisfactory operating condition and capable of efficiently performing the scale/scope of the proposed dredging activities within the time frame of the IAC.

1.6.2 Operation Phase

The CSD operates by positioning the spuds poles and anchor winches to ensure the vessel is firmly anchored during dredging. After lowering the ladder with the cutter head at the end, the cutter head is move sideways by pulling the side wires. The loosen materials are suck by the dredge pumps through the suction pipes. The CSD moves forward by means of spud carriage. **Figure 1-6** shows the spud poles, ladder, dredge pump and cutter head of the CSD.

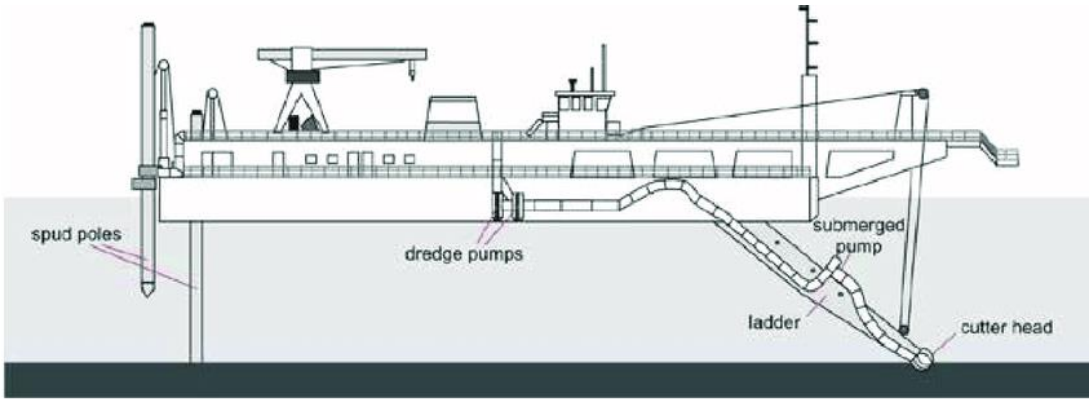


Figure 1-6: Cutter-Suction Dredger

The dredging channel to be created shall maintain the angle of repose to minimize slope failure. Sounding shall be conducted every 100 meters of the dredge channel for the calculation of volume or by drop survey of vessel. The dredging operation is intended to remove substantial volume of river materials to ease and reduce the swelling of the river that pose a threat to the vicinity.

During the entire project duration, progress will be monitored through bathymetric surveys. Report of the result of the bathymetric survey shall be submitted to the IAC for monitoring purposes. Environmental impact and water quality will be monitored through water sampling at various locations of the project site under the supervision of the monitoring team by the Environmental Management Bureau Region IVB (EMB-MIMAROPA) and the designated Monitoring Team of the IAC. The frequency of the submission of reports shall be in accordance with the set of rules to be issued by the IAC.

Figure 1-7 shows the dredging operation cycle.

1.6.3 Decommissioning Phase

Decommissioning phase shall include demobilization of the dredging equipment such as the dredging vessel and hauling barges. The rented field office will be turned over to the lessor.

In case abandonment is imperative due to force majeur or any other reasons, the structures, equipment and other related facilities may be used for other applications. Otherwise, the removal of structures, equipment and machineries from the existing site will be done to minimize possible threats to the surrounding environment.

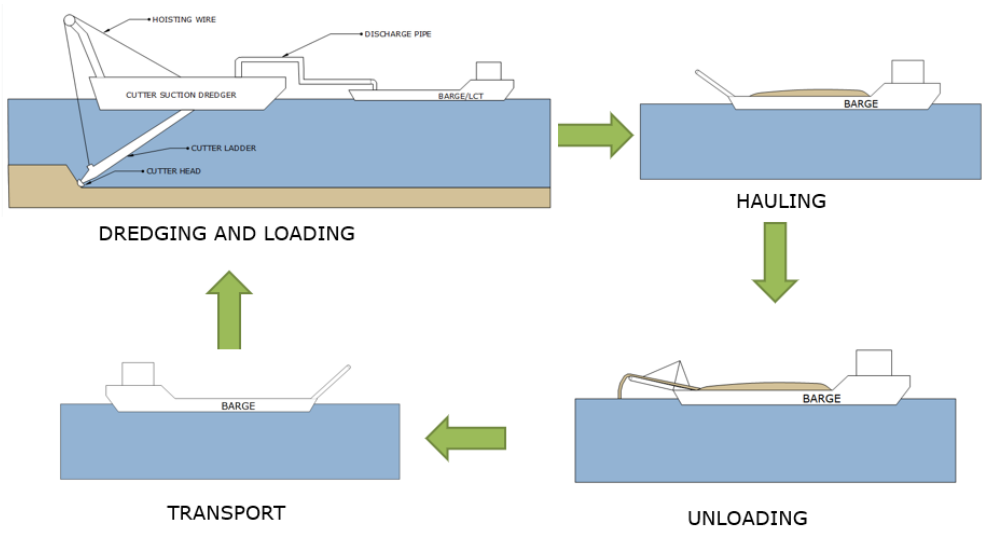


Figure 1-7: Cutter Suction Dredger Operation Cycle

1.7 Manpower Requirements

In order to achieve a unified management and ensure the quality and management of the dredging project, the following project organization will be fully responsible for the command and coordination and organization of the project activities, so as to ensure its efficient and high-quality completion.

Table 1-5 below shows the manpower requirements for the project.

Table 1-5: Manpower Requirements

Position	Number
Chief Site Engineer	1
Administrative Officer	1
Engineering Safety and Quality Manager	1
Materials and Equipment Manager	1
Environment, Health and Safety Manager / PCO	1
Admin Staff	6
Security	4
CSD operator	16
Pipeline worker	12
Pelican Barge Operator	60
General worker	20

1.8 Project Cost

The project cost is estimated at 266 million pesos. The said cost is subject to change based on actual field conditions encountered on the project site. The project cost is based on the cost of rent of the equipment per cubic meter of dredged material.

2 ECOLOGICAL PROFILE AND ASSESSMENT OF IMPATS OF LAND DEVELOPMENT

2.1 Study Area Coverage

2.1.1 Land

The study area is located in the norther portion of the Municipality of Baco. It includes the river mouth and the 10 km section of the Alag River. The coastal area of the Alag River is covered by Brgy. Water.

The direct impact area is the river mouth and the 10 km upstream section of the Alag River. It includes the waterway with length of 250 m for the Alag River.

The proposed project has no direct impact on land since no structure will be constructed onshore. Therefore, no trees and other vegetations will be removed. Figure 2-1 presents the location map of the project.

2.1.2 Water

The study area covers the river deltas and channels of Alag River. The river channels have length of 10 km upstream from the river mouth and average width of 100 m. The study area covers the lower portion or the meanders of the two rivers forming the river valley.

The head water of Alag River is located in the Alag-Baco Watershed. The watershed is located at the southern portion of the municipality. The river system drains northwards towards the Subaang Bay.

2.1.3 People

The surrounding barangays of the two rivers have extensive road network that connects instituitions and residences. Figure 2-1 shows the barangay roads that connect to the provincial road. Most of the barangay roads are two-lane concrete road. Coastal barangays such as barangays of Water, Pulang Tubig and San Andres use the rivers for accessing the coastal areas. Upstream of the river are used occassionaly for navigation using small banca.

The direct impact area covers the barangays of Water, Putican Cabulo, Malapad, Burbuli, Poblacion, Catwiran I, Alag, Santa Cruz, and Lumangbayan. Indirect impact area includes the barangays of Mangangan I, Mayabig, Santa Rosa I, Catwiran II and Dulangan I, where the project area of the river does not traverse within their boundaries. The mentionded barangays are considered secondary impact areas because these areas may experience the changes in the river as the project progresses such as improve in river flow. The map of direct and indirect impact areas is presented in Figure 2-2.

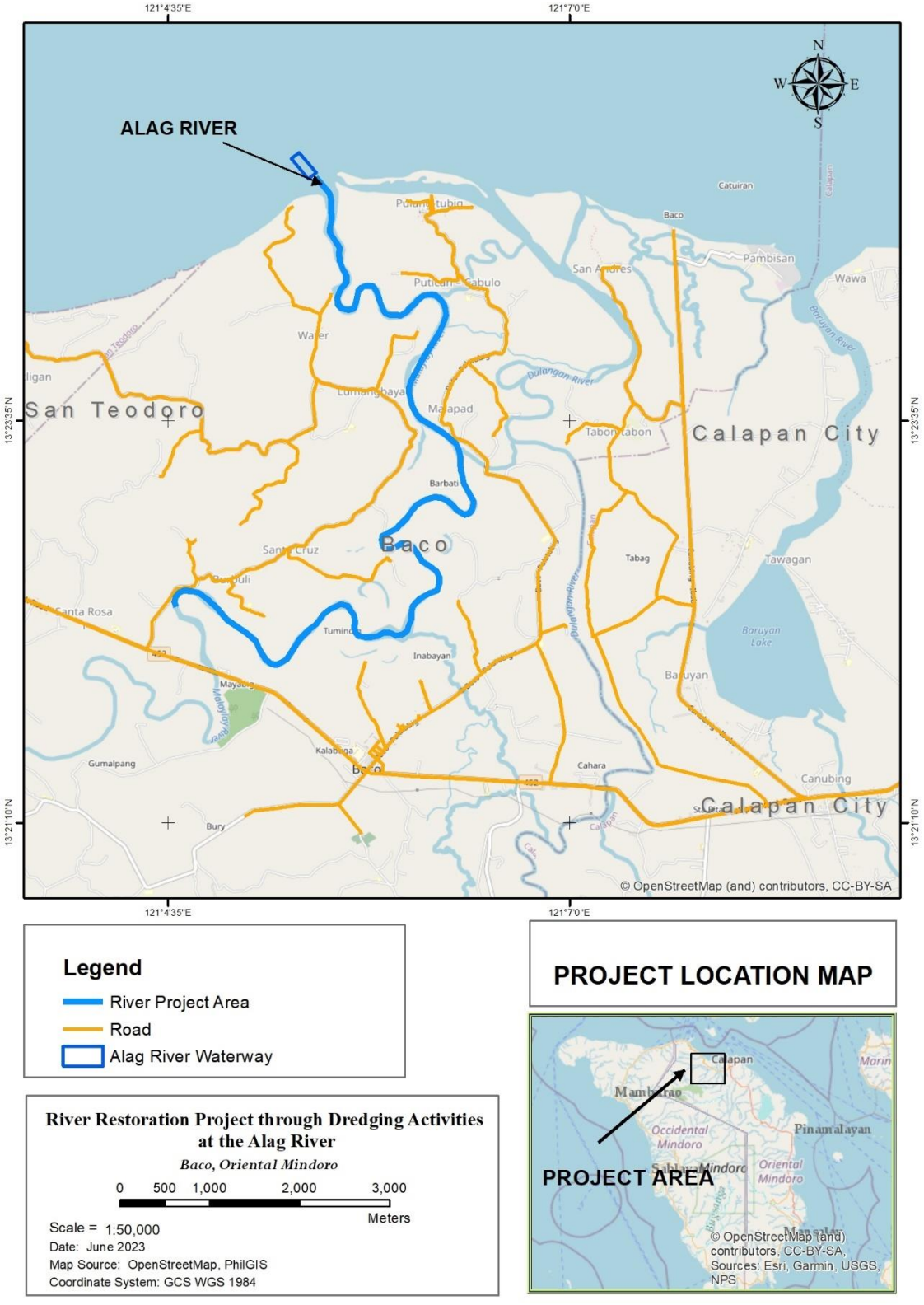


Figure 2-1: Project Location Map

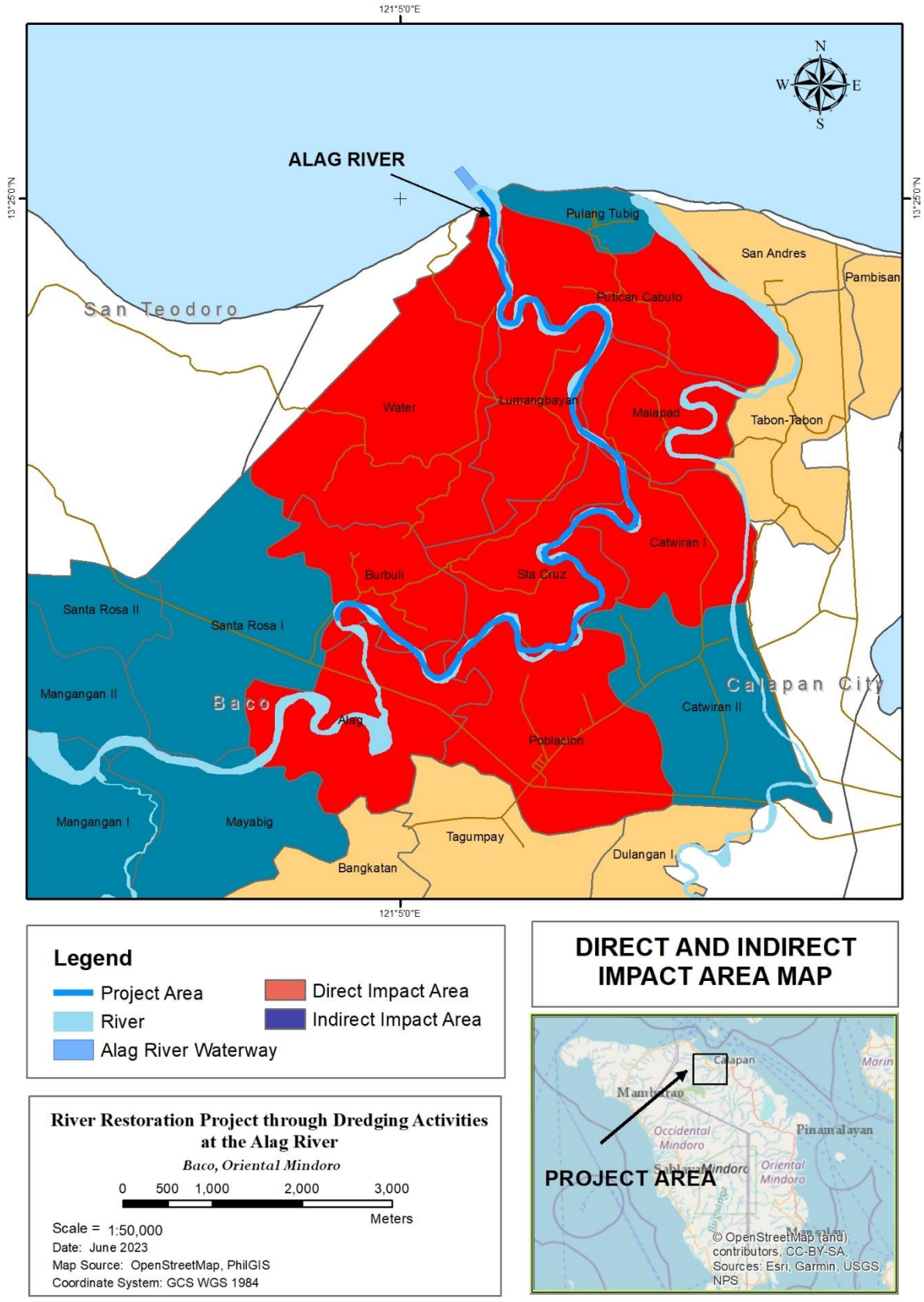


Figure 2-2: Direct and Indirect Impact Area Map

2.2 Ecoprofile and Assessment of Impacts

2.2.1 Land

2.2.1.1 Land Use and Classification

The project area is compatible with the Comprehensive Land Use Plan (2018-2028) of the Municipality of Baco. A certification was issued to BNRC by the Municipal Planning and Development Coordinator on July 17, 2023 (Annex 7).

The municipality of Baco has a total land area of **38,263.70** hectares. According to MPDO, more than half of the total land area (65 percent) is classified as forestland, while alienable and disposable land comprises 31.32 percent of the total land area (Table 2-1).

The proposed project will not change the existing land use of the area. Figure 2-3 presents the land use map of the project area.

Table 2-1: Existing Land Use of Baco

Land Use Categories	Area (ha)	%
Built-up		
Commercial	1.66	0.004
Institutional	62.21	0.163
Residential	692.24	1.809
Tourism	45.45	0.119
Agricultural Use		
Mixed Agricultural	8,825.51	23.065
Irrigated Rice	2,070.73	5.412
Rain-fed Rice	652.76	1.706
Forest and Other Forest Use		
Protection Forest	24,856.17	64.960
Production Forest	6.04	0.016
Inlad Water Use		
Fish Pond	73.67	0.193
Mangrove	266.17	0.696
Rivers/Creeks	573.74	1.499
Other Land Uses		
Cemetery	6.91	0.018
Roads	82.54	0.216
Idle Land and Open Spaces	47.87	0.125
TOTAL	**38,263.70**	**100.00**

In addition, the Mines and Geosciences Bureau issued an Area Status/Clearance on the proposed project. It certifies that the project does not overlap with any mining tenement application/rights. The certification is presented in Annex 11

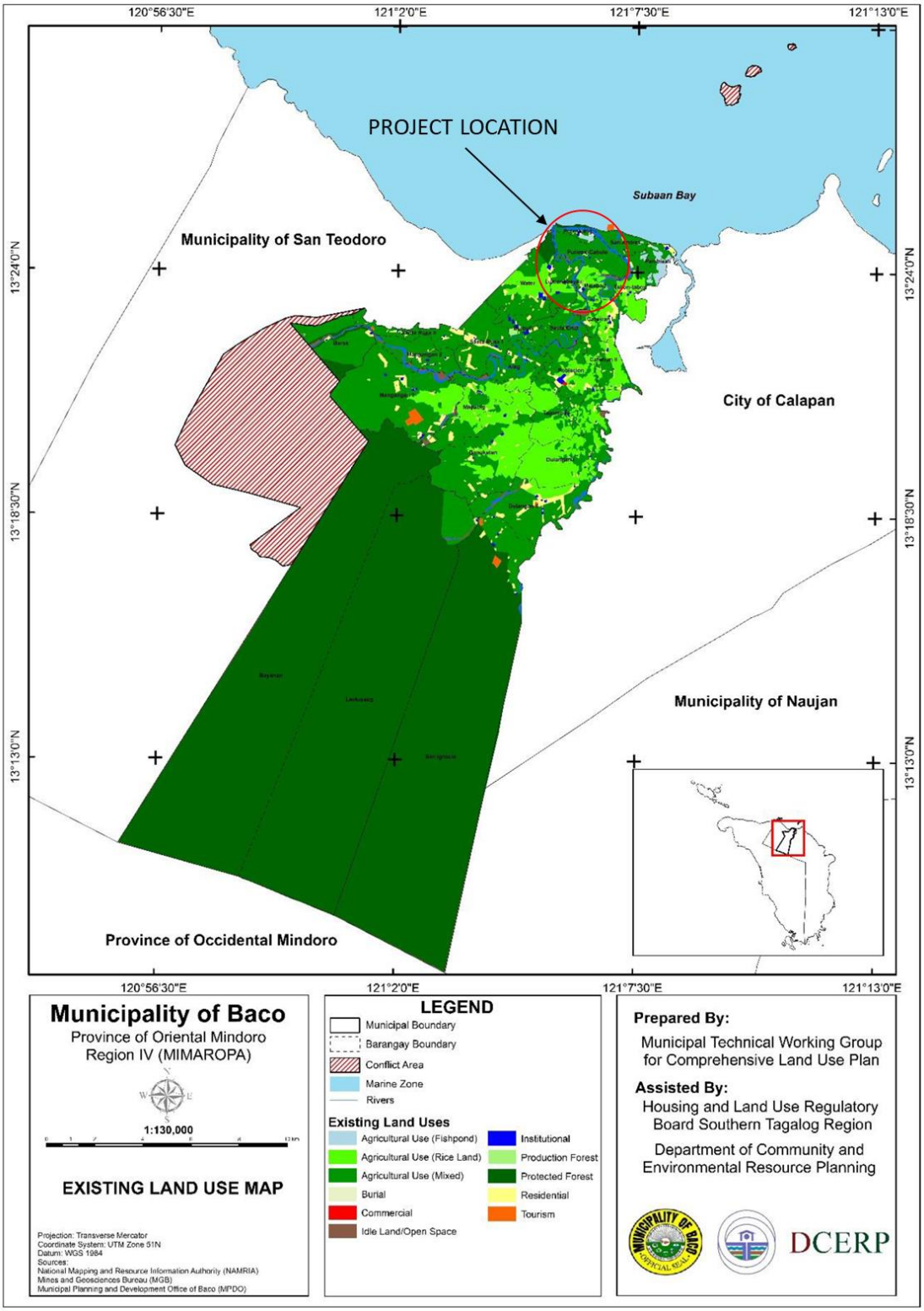


Figure 2-3: Land Use Map of Baco

2.2.1.2 Impact on Compatibility with classification as an Environmental Critical Area (ECA)

The Project is considered as Environmental Critical Project (ECP) located within Environmentally Critical Area (ECA) as defined by Presidential Proclamation 2146 and further clarified in Section 3.b of EMB Memorandum Circular 005 Series of 2014 "Technical Definition of ECA and Corresponding Operationalization Guide of the Revised Guidelines for Coverage and Screening and Standardized Requirements under the Philippines EIS System". The Memorandum Circular states that an area is environmentally critical if it exhibits any of characteristics described in the 12 categories that define environmentally critical areas**. Table 2-2** shows a brief description of the ECA categories and the site characteristics that qualifies the project area under each category.

Table 2-2: Criteria for Environmentally Critical Areas

ECA Categories	Technical Definition (EMB MC 2014-05)	Project Site Characteristics
Areas declared by law as national parks, watershed reserves, wildlife preserves, and sanctuaries	Areas declared under RA 7586 (NIPAS Act) Areas declared by other NGAs, LGUs, International commitments and declarations	Not Present in the project area
Areas set aside as aesthetic, potential tourist spots	Aesthetic potential tourist spot declared by the LGU, DOT or other appropriate authorities for tourism development. Class 1 and 2 Caves	Not Present in the project area
Areas which constitute the habitat for any endangered or threatened species of indigenous Philippine wildlife (flora and fauna)	Areas identified as Key Biodiversity Areas or local conservation areas	Not Present in the project area
Areas of unique historic, archaeological, geological, or scientific interests	Areas declared as historic sites, Barangay or municipality of cultural or scientific significance to the nation Barangay or municipality where archaeological, paleontological, and anthropological sites/reservations are located	Not Present in the project area
Areas which are traditionally occupied by cultural communities or tribes	Areas issued with CADT or CALT Areas that are historically/traditionally occupied as ancestral lands or ancestral domains of indigenous communities	Not Present in the project area
Areas frequently visited and/or hard-hit by natural calamities.	Geologic hazards Area	Present
	Areas Frequently visited by typhoons	Present
	Areas prone to volcanic activities/earthquakes	Not Present in the project area
Areas with critical slope	Areas with slope of 50% or more	Not Present in the project area
Areas classified as prime agricultural lands	Lands that can be used for various or specific agricultural activities and can provide optimum sustainable yield with a minimum of inputs and development costs	Not Present in the project area

ECA Categories	Technical Definition (EMB MC 2014-05)	Project Site Characteristics
Recharge areas of Aquifers	Sources of water replenishment where rain water or seepage actually enters the aquifers. Areas under this classification shall be limited to all local or Non-national watersheds and geothermal reservations.	Not Present in the project area
Water bodies	All natural water bodies (e.g. rivers, lake, bay) that have been classified or not	Present
Mangrove areas		Present

2.3 Water

2.3.1 Hydrology/Hydrogeology

2.3.1.1 Change in Drainage Morphology/ Inducement of Flooding/ Reduction in Stream Volumetric Flow

The project area is covered by the Alag-Baco Watershed. The head waters of Alag River and Longos River are from the mountainous area of Baco and San Teodoro. About 17,710 ha of the watershed is covered by the Baco Municipality. The Alag River traverses the western part of the watershed while the Longos River runs along the eastern part of the watershed. The two rivers are interconnected downstream by narrow rivers and creeks.

The proposed project which is river restoration through dredging activities will change the river depth along the 10 km channel from the river mouth. It is intended to reduce the flooding in the adjacent area by increasing the capacity of the river and thus increasing the stream volumetric flow.

2.3.1.2 Change in Stream Depth

Baco has abundant surface water resources. Several rivers and streams are present in the municipality. It has seven major river systems; Catwiran, Alag, Longos, Baras, Mayabig, Carayrayan, Dulangan, and Mangangan I. These rivers are commonly used for irrigation purposes. Alag, Dulangan, and Catwiran rivers are among the six rivers identified as potential sources of hydropower by the Provincial government of Oriental Mindoro.

However, due to frequent typhoons, these river systems are degrading especially the Alag River. Rivers were reported to cause flood in residential areas and agricultural lands due to its siltation. Soil erosion along the side of the river is also one of the factors that cause flood.

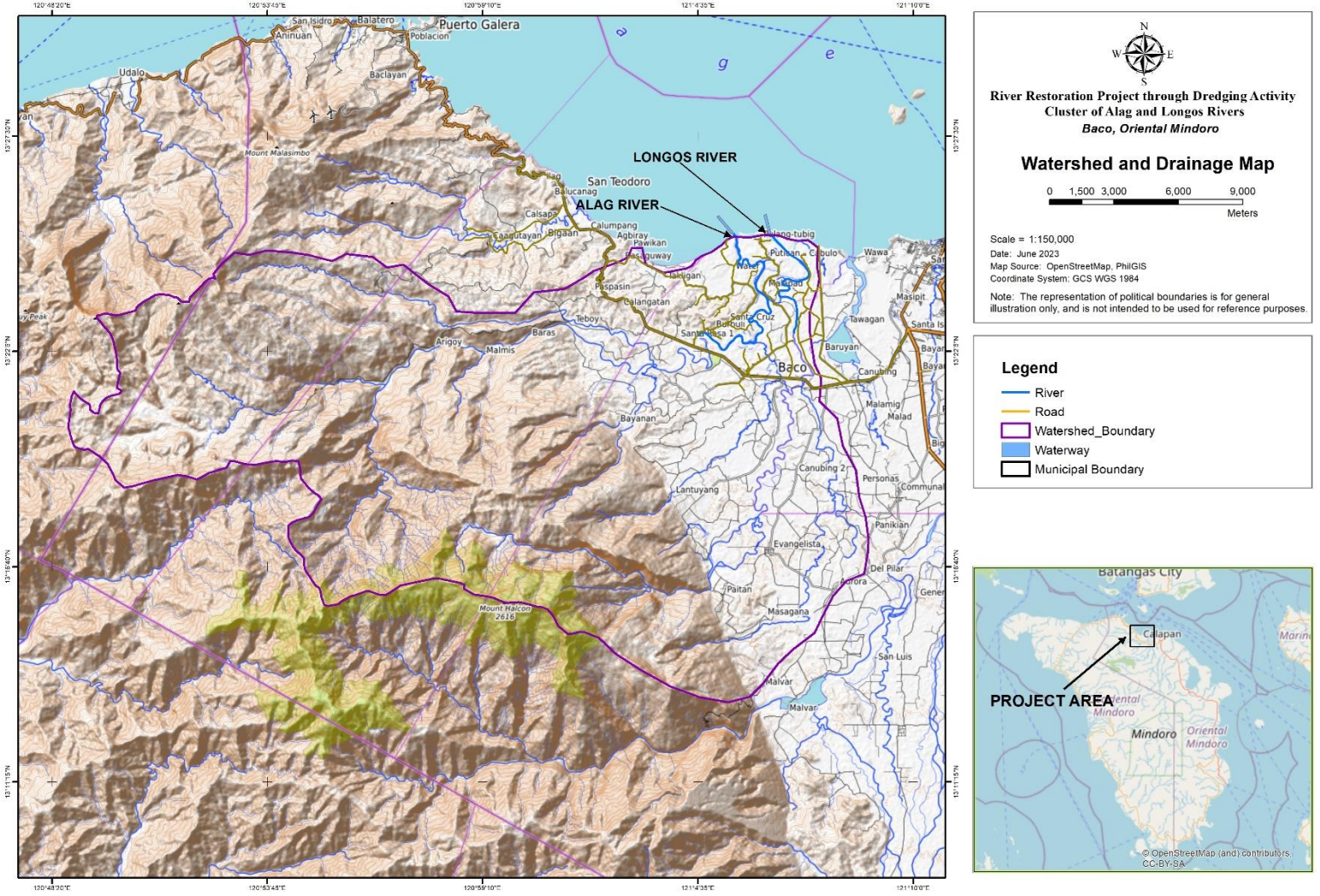


Figure 2-4: Watershed and Drainage Map

2.3.1.3 Depletion of Water Resources/Competition in Water Use

2.3.1.3.1 Surface Water

The section of Alag River near the coastal area is mainly used for access to sea using small boat. The surface water in this area is not used for irrigation and domestic use because of high salinity. Tributaries of the river have been seen to be used for recreational swimming.

The proposed project is essentially a dredging activity and will not utilize the surface water for its operation nor compete with its usage.

2.3.1.3.2 Groundwater

The Municipality of Baco has abundant groundwater resources, especially in coastal areas such as Barangays Water, Pulang Tubig and San Andres which have shallow wells that yield groundwater. Inner barangays such as Tabon-Tabon and Putican-Cabulo which are near coastal areas also have shallow wells that yield groundwater within 20 meters from the surface.

Coastal barangays including Pulang Tubig, San Andres and Pambisan have the groundwater sources that are identified to be the easiest to extract water from. Free-flowing wells are abundant in coastal barangays.

Deep well areas yielding groundwater greater than 20 meters from the ground are found in Barangays Burbuli, Sta. Rosa I, Sta. Rosa II, Baras, Mangangan I, Mangangan II, Mayabig, Bangkatan and Dulangan II.

2.3.1.3.3 Impact on Water Resource

The proposed project is essentially a dredging activity and will not utilize the surface water and groundwater for its operation nor compete with its usage.

2.3.2 Oceanography

2.3.2.1 Change/Disruption in Circulation Pattern Due to Dredging

The proposed project will change the bathymetry of the coastal area which is 250m from the river mouth of Alag River. It will dredge the area to the designed depth as specified in the Dredging Master Plan approved by the DPWH. There will be no construction of structure such as jetty or causeway in the project area.

2.3.2.2 Bathymetry

The bathymetric survey was of the Alag River was conducted to generate the cross-sections and profile for the navigational waterway clearing. The cross-sections and profiles are included in the Dredging Plan (Annex 13). The bathymetric map is shown in Figure 2-5.

The offshore of Alag River has depth ranging from 2 m at near the shoreline to 15 m at 250 m from the river mouth. The design depth for dredging is 10.5 m to 15 m maintaining a slope of 2.01%. Figure 2-6 shows the profile of the waterway.

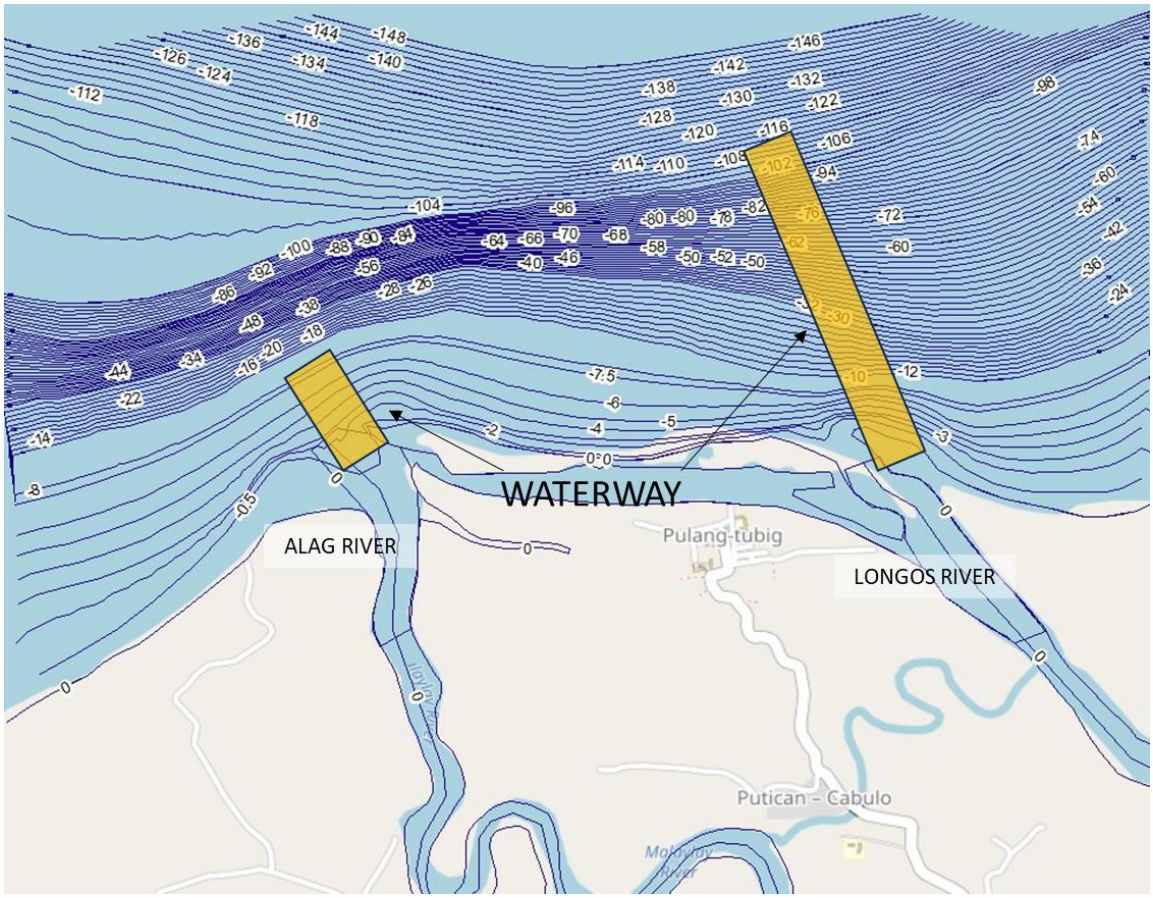


Figure 2-5: Bathymetric Map of the Project Area

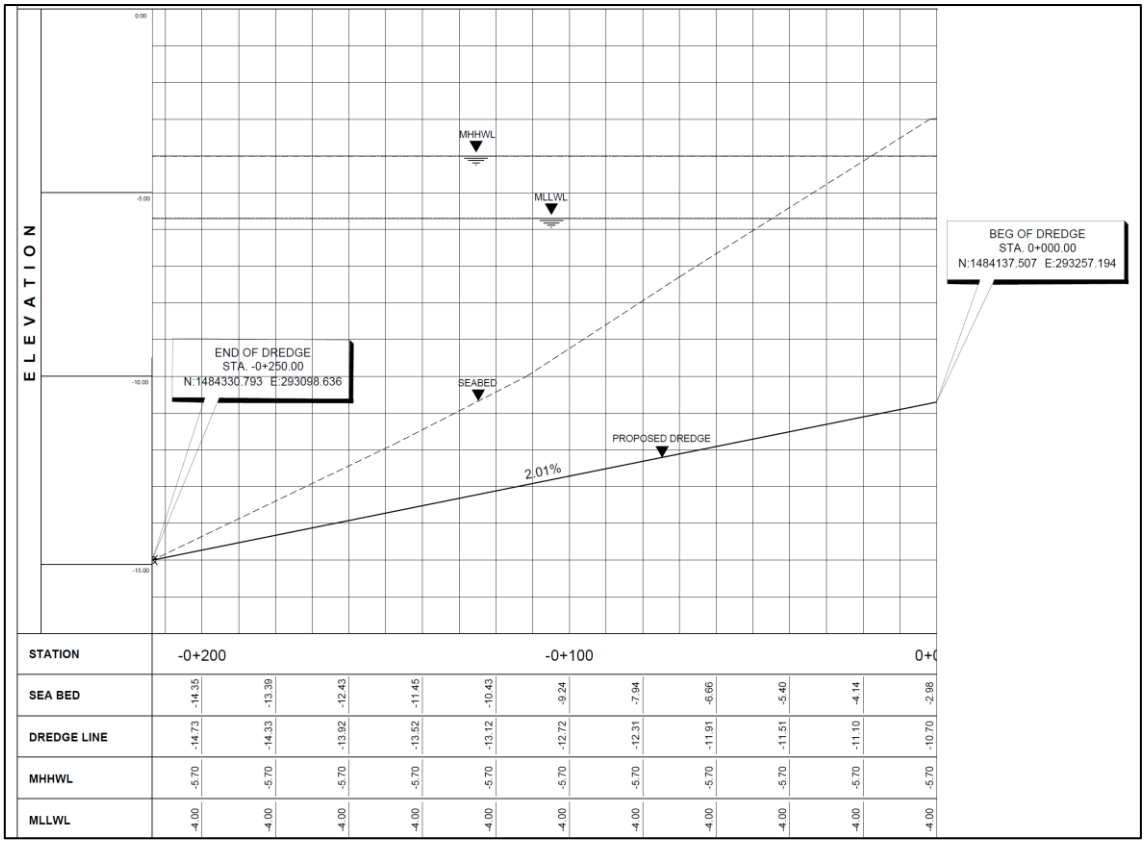


Figure 2-6: Navigational Waterway Clearing Profile of Alag River

2.3.3 Water Quality

2.3.3.1 Degradation of Groundwater Quality

2.3.3.1.1 Methodology

Groundwater quality sampling was conducted on July 19, 2023 in the barangays of Water, Burburi, Pulang Tubig, and Malapad. Water quality checker was used to measure in-situ parameters such as pH, temperature and salinity. Grab sampling method was employed for the other parameters.

Containers for water sample were obtained from the DENR-accredited laboratory. A total of 3 samples were collected. Each water samples were labelled properly for identification.

Table 2-3: Methodology for Water Quality Sampling

Parameters	Methodology
Physico-Chemical Test	
Total Suspended Solids (TSS)	Grab sampling
Oil and Grease	Grab sampling
Biochemical Oxygen Demand (BOD)	Grab sampling
Fecal Coliform	Grab sampling
Temperature	Water quality checker
pH	Water quality checker
Total Dissolved Solids (TDS)	Water quality checker
Salinity	Water quality checker

2.3.3.1.2 Groundwater Sampling

There are 3 sampling stations identified for groundwater quality. Geographical coordinates of stations were obtained using GPS and the water quality in-situ measurements in each station were measured using a water quality checker. Collected water samples were analyzed through DENR-accredited laboratory.

The description and location of the stations are presented in Table 2-4 and Figure 2-8.

Table 2-4: Description of Groundwater Sampling Stations

Station	Intended Beneficial Use (DENR DAO 2016-08)	Description	Geographical Coordinates	
			Latitude	Longitude
GW1	Class A Public Water Supply Class II – Intended sources of water supply requiring conventional treatment (coagulation, sedimentation, filtration and disinfection) to meet the latest PNSDW	Artesian well, Brgy. Water	13°23'28.30"N	121° 05'27.66"E
GW2		Artesian well with electric pump, Brgy. Burburi	13°22'39.50"N	121° 04'57.14"E
GW4		Artesian well, Brgy. Malapad	13°24'17.90"N	121° 06'31.13"E

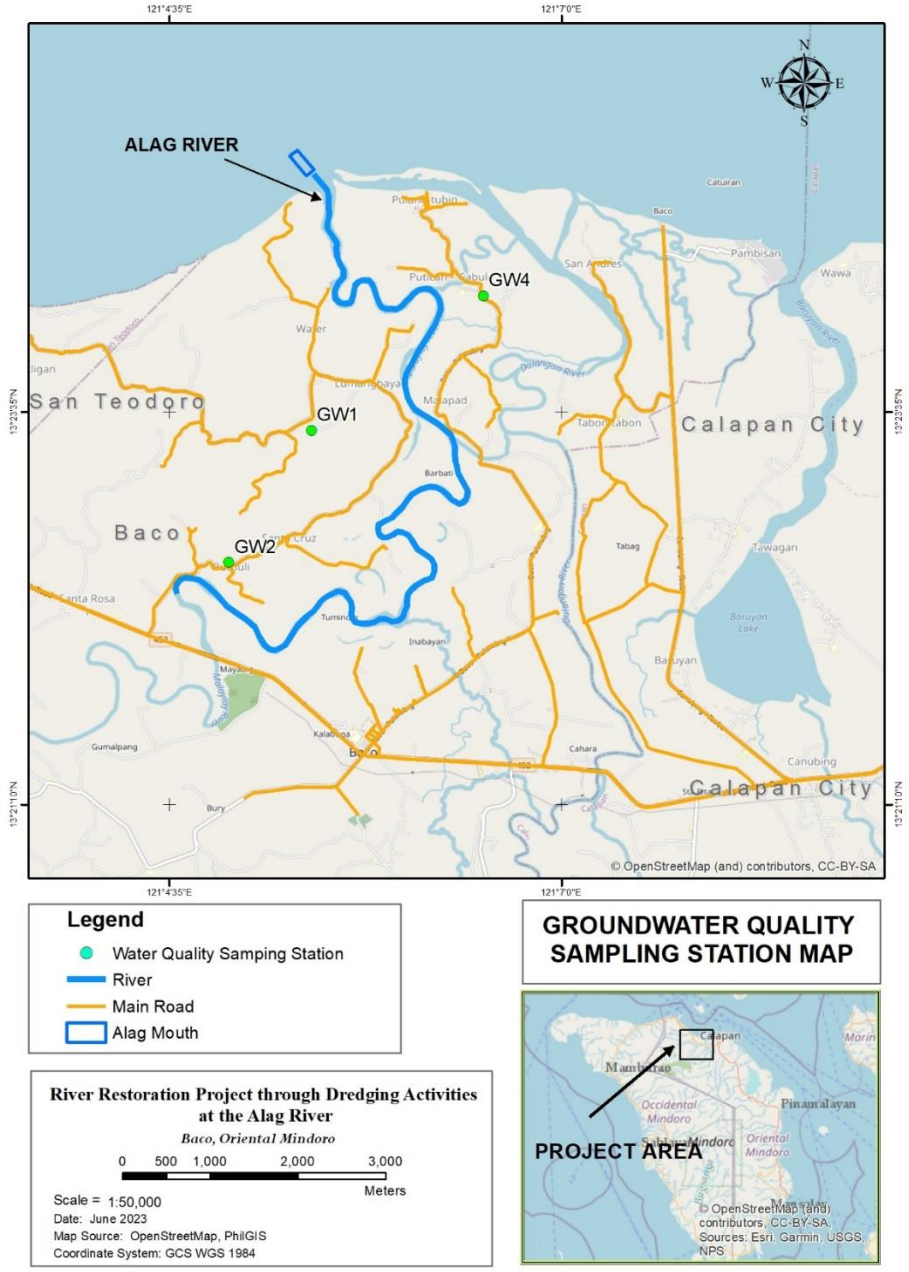


Figure 2-7: Groundwater Quality Sampling Station Map

2.3.3.2 Groundwater Quality Sampling

The result of groundwater quality sampling is presented in Table 2-5. The result of analysis shows that all stations except GW4 have Oil and Grease that exceeds the WQG of 1 mg/L for Class A. Fecal coliform results also exceeds the WQG. All other parameters are within the WQG. The result of analysis is presented in Annex 8.

Table 2-5: Summary of Groundwater Quality Sampling Results

Parameter	Unit	GW1	GW2	GW4	WQG
F. Coliform	MPN/100mL	45	<18	45	<1.1
Oil and Grease	mg/L	2.84	2.57	<0.70	1
pH		7.05	6.56	8.26	6.5 – 8.5
BOD	mg/L	<12	<12	<12	
TSS	mg/L	<2.1	23	4	50

Parameter	Unit	GW1	GW2	GW4	WQG
Salinity	mg/L	0.01	0.01	0.01	
Temp	°C	24.7	27.1	28.9	26-30

2.3.3.3 Degradation of Surface Water Quality

2.3.3.3.1 Methodology

Water quality sampling was conducted on the Alag River on 18 June 2023. Water quality checker was used to measure in-situ parameters such as pH, temperature and salinity. Grab sampling method was employed for the other parameters.

Containers for water sample were obtained from the DENR-accredited laboratory. A total of 6 samples were collected. Each water samples were labelled properly for identification.

Table 2-6: Methodology for Water Quality Sampling

Parameters	Methodology
Physico-Chemical Test	
Total Suspended Solids (TSS)	Grab sampling
Oil and Grease	Grab sampling
Biochemical Oxygen Demand (BOD)	Grab sampling
Fecal Coliform	Grab sampling
Temperature	Water quality checker
pH	Water quality checker
Total Dissolved Solids (TDS)	Water quality checker
Salinity	Water quality checker

2.3.3.3.2 Water Sampling

There are 3 sampling stations identified for surface water quality. Geographical coordinates of stations were obtained using GPS and the water quality in-situ measurements in each station were done using a water quality checker and collected water samples were analyzed through DENR-accredited laboratories.

The description and location of the stations are presented in Table 2-7 and Figure 2-8. Sampling activites was conducted on June 18, 2023 with FW1, and FW3 samples were simultaneously collected at 9:00 am. The rest of the stations were sampled afterwards. Sample collection was finished at around 10:00 am. Samples were transported from Calapan Port to Batangas Port via roro and delivered at the laboratory in Sto. Tomas at 3:00 pm.

Table 2-7: Description of Surface Water Sampling Stations

Station	Intended Beneficial Use (DENR DAO 2016-08)	Description	Geographical Coordinates	
			Latitude	Longitude
FW1	Class C 1. Fishery Water for the propagation and growth of fish and other aquatic resources 2. Recreational Water Class II – For boating, fishing, or similar activities 3. For agriculture, irrigation, and livestock watering	Alag River, Brgy. Water	13°24'20.30"N	121°05'35.93"E
FW2		Alag River, Brgy. Malapad	13°23'28.13"N	121°06'17.41"E
FW3		Alag River, Brgy. Burburi	13°22'18.35"N	121°05'23.92"E

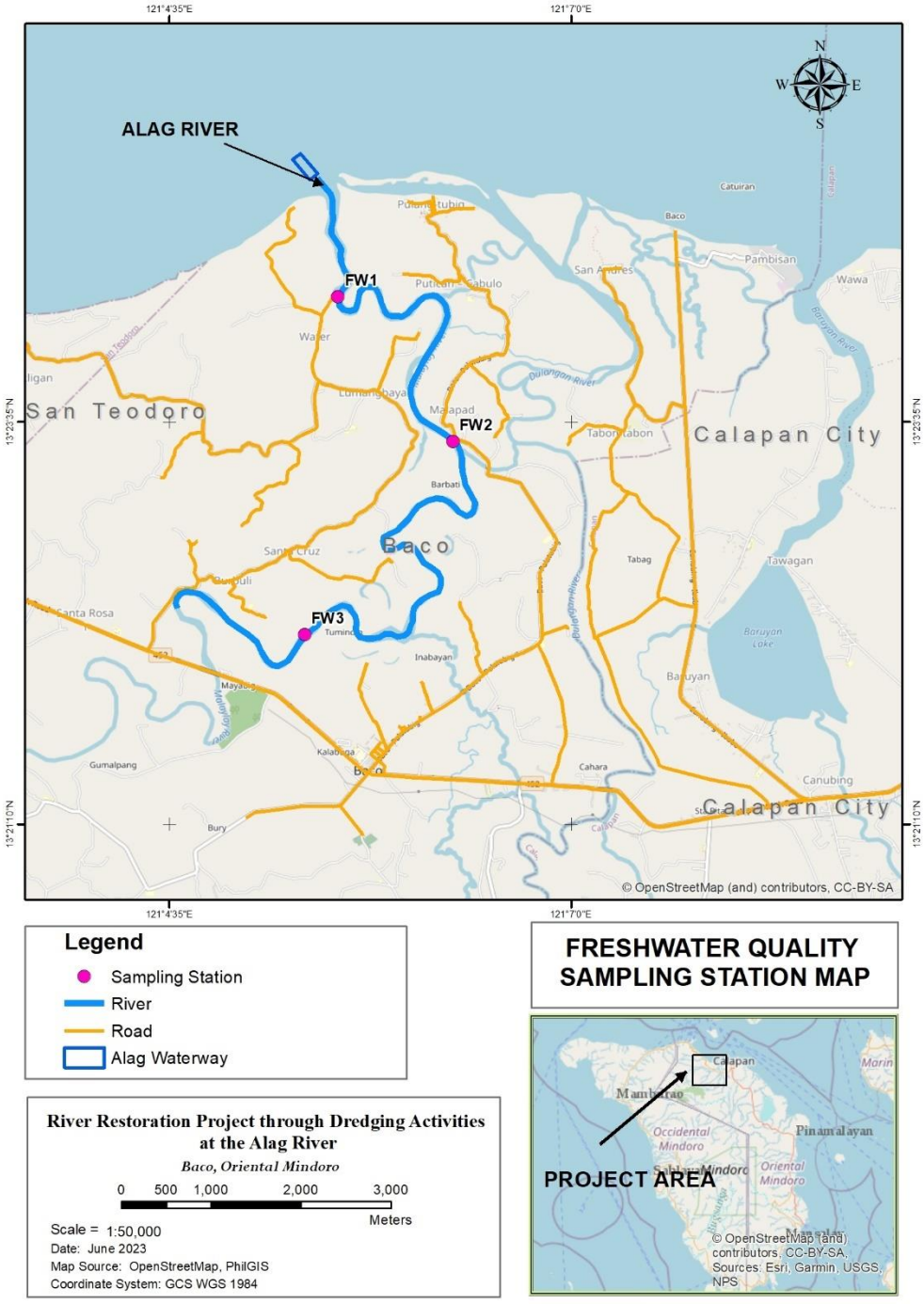


Figure 2-8: Freshwater Quality Sampling Station Map

2.3.3.4 Water Quality Sampling

The result of freshwater quality sampling is presented in Table 2-8. The result of analysis shows that fecal coliform exceeds the WQG of 200 MPN/100mL for Class C water body for all stations. BOD result for all stations is within the WQG of 7 mg/L except at FW1 which has value of 10 mg/L. All other parameters are within the WQG. The result of analysis is presented in Annex 8.

Table 2-8: Summary of Water Quality Sampling Results

Parameter	Unit	FW1	FW2	FW3	WQG
F. Coliform	MPN/100mL	$94x10^2$	$94x10^2$	$94x10^2$	200
Oil and Grease	mg/L	<0.7	<0.7	<0.7	2
pH		8.09	7.60	7.78	6.5 - 9
BOD	mg/L	10	<4	<4	7
TSS	mg/L	66	130	166	80
Salinity	mg/L	6.7	0	0	
Temp	°C	29.6	31.8	35.8	25-31

2.3.3.5 Impact Assessment

The possible impact of the project to the water quality is the increase in total suspended solids (TSS) of freshwater during dredging activities. The source of suspended solids is the resuspension of sediments

2.3.3.6 Degradation of Coastal/Marine Water Quality

2.3.3.6.1 Methodology

On June 18, 2023 water quality sampling was conducted on the marine water of Alag and Longos rivers. Water quality checker was used to measure in-situ parameters such as pH, and temperature. Grab sampling method was employed for the other parameters.

Containers for water sample were obtained from the DENR-accredited laboratory. A total of 3 samples were collected. Each water samples were labelled properly for identification.

Table 2-9: Methodology for Water Quality Sampling

Parameters	Methodology
Physico-Chemical Test	
Total Suspended Solids (TSS)	Grab sampling
Oil and Grease	Grab sampling
Biochemical Oxygen Demand (BOD)	Grab sampling
Fecal Coliform	Grab sampling
Temperature	Water quality checker
pH	Water quality checker
Total Dissolved Solids (TDS)	Water quality checker

2.3.3.6.2 Water Sampling

There are 3 sampling stations identified for surface water quality. Geographical coordinates of stations were obtained using GPS and the water quality in-situ measurements in each station were done using a water quality checker and collected water samples were analyzed through DENR-accredited laboratories.

Table 2-10: Description of Surface Water Sampling Stations

Station	Intended Beneficial Use (DENR DAO 2016-08)	Description	Geographical Coordinates	
			Latitude	Longitude
MW1	Class SC	Coastal Water Near Alag River	13°25'06.23"N	121° 05'24.18"E
MW2		Coastal Water between Alag and Longos rivers	13°25'06.91"N	121° 06'21.86"E
MW3		Coastal Water near Longos River	13°24'48.85"N	121° 05'02.84"E

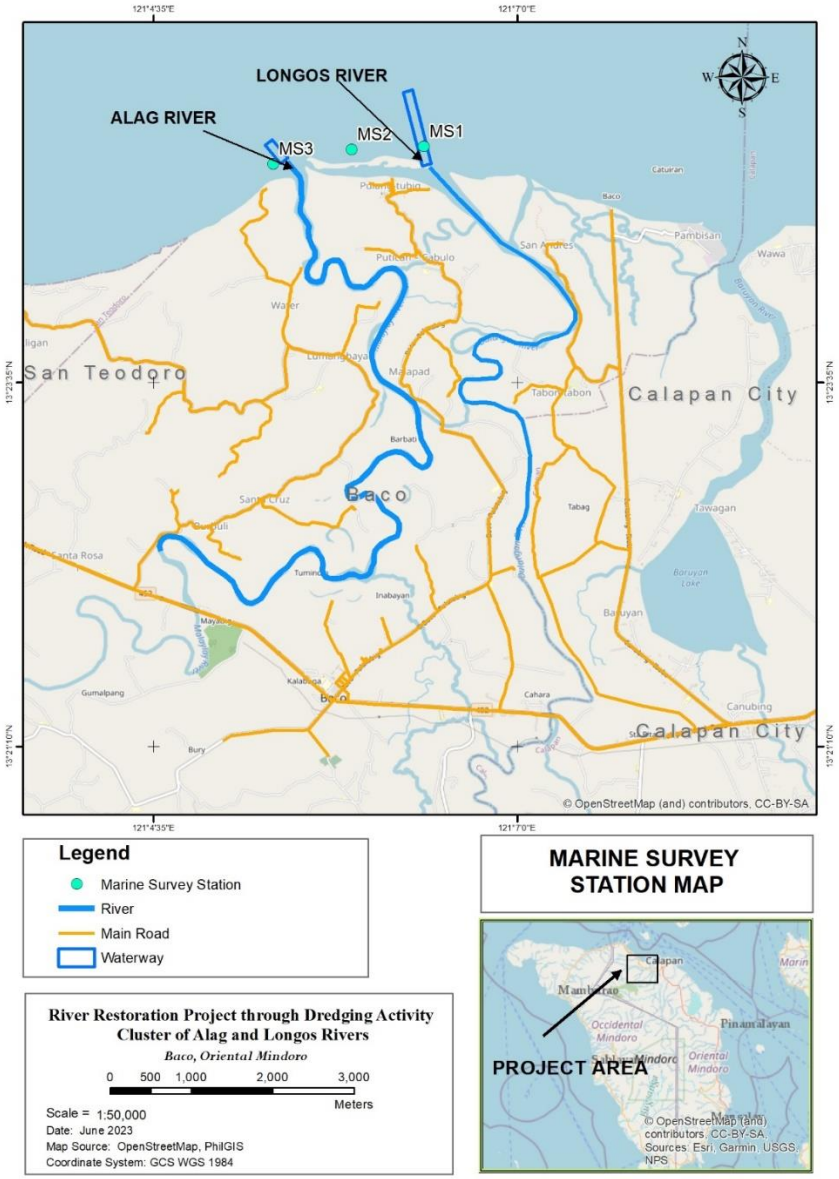


Figure 2-9: Marine Water Quality Sampling Station Map

2.3.3.7 Marine Water Quality Sampling

The result of marine watery quality sampling is presented in Table 2-8. The result of analysis shows that fecal coliform is within the WQG of 200 MPN/100mL for Class SC water body except for station MW2 with value of 1300 MPN/100mL. BOD result for all stations is within the WQG of 7 mg/L. All other parameters are within the WQG. The result of analysis is presented in Annex 8.

Table 2-11: Summary of Water Quality Sampling Results

Parameter	Unit	MW1	MW2	MW3	WQG
F. Coliform	MPN/100mL	<18	1300	130	200
Oil and Grease	mg/L	<0.7	<0.7	<0.7	3
pH		8.35	8.20	8.24	6.5 - 9
BOD	mg/L	<12	<12	<12	7
TSS	mg/L	36	43	29	80
Temp	°C	26.1	25.2	25.3	25-31

2.3.3.8 Impact Assessment

The possible impact of the project to the water quality is the increase in total suspended solids (TSS) of freshwater during dredging activities. The source of suspended solids is the resuspension of sediments

2.3.4 Water Ecology

2.3.4.1 Freshwater Ecology Survey

Freshwater Ecology Survey was conducted on June 19-22, 2023 on the Alag River covered by the project area. The freshwater ecology along the alignment of the proposed project was assessed by collecting biological samples on 2 sampling sites. The sampling station coordinates and location map are presented in Table 2-12 and Figure 2-10 respectively.

Table 2-12: Freshwater Ecology Sampling Sites

Sampling Point	Coordinates		Description
	N	E	
FWE1	13°24'20.43"N	121° 5'34.67"E	Alag River Downstream
FWE2	13°22'26.72"N	121° 4'54.73"E	Alag River Upstream

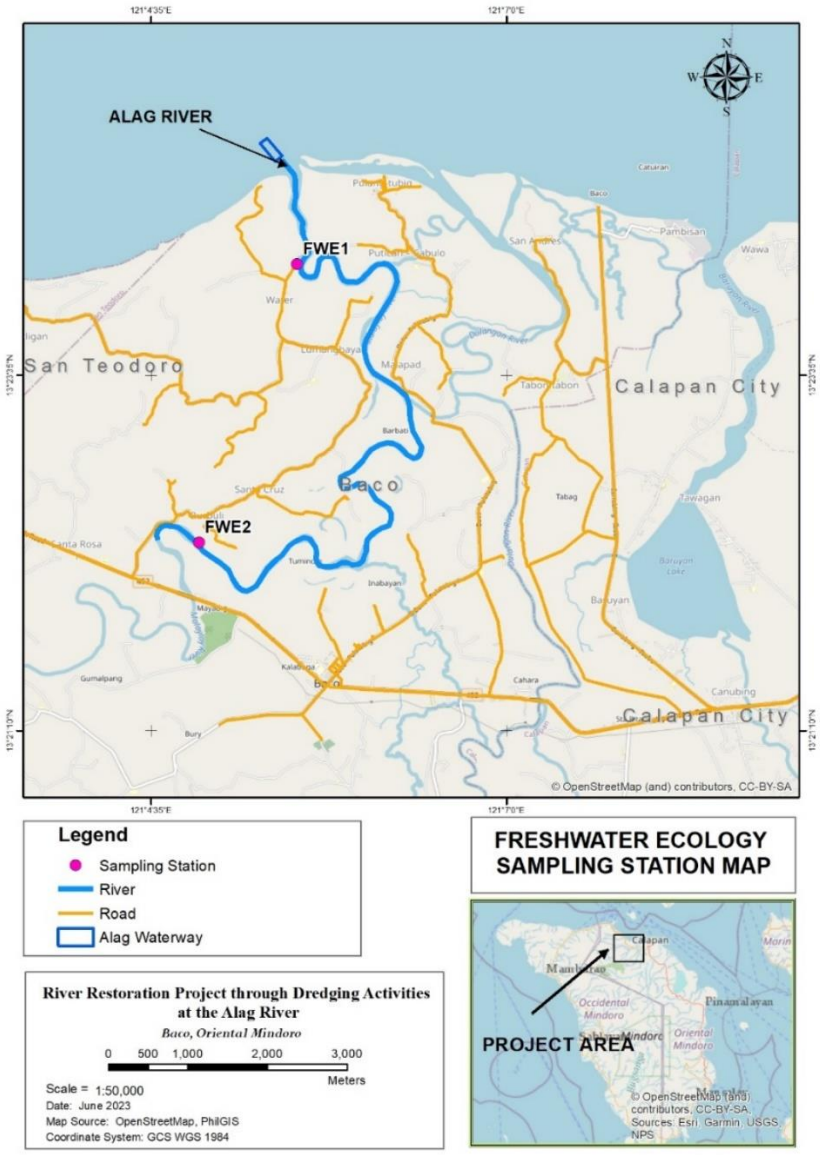


Figure 2-10: Freshwater Ecology Sampling Station Map

2.3.4.2 Phytoplankton

The microscopic aquatic organisms known as "plankton" are suspended freely in natural waters and offer little to no resistance to currents. Microscopic algae known as phytoplankton can be filamentous, colonial, or unicellular. Phytoplankton, in particular, has long been utilized as a water quality indicator. While certain species are vulnerable to organic and chemical pollutants, others thrive in highly eutrophic conditions. Some species experience toxic blooms, which can occasionally produce unpleasant tastes and odors as well as toxic or anoxic conditions that cause animal fatalities or human disease. Zooplankton and phytoplankton species composition may also be used to measure water quality.

For this study, plankton samples were collected from two stations on the Alag River. Three replicate samples of zooplankton and phytoplankton were obtained by passing 100 mL of water through a plankton net, with a mesh size of 64 µ and a mouth diameter of 0.3 m. The collected samples were placed in properly labeled 1 L plastic bottles, immediately fixed in alcohol, and brought to the laboratory for processing and further analysis. Plankton enumeration was done using a counting chamber observed under a compound microscope and identified to the lowest possible taxa using taxonomic keys of van Vuuren et al. (2005), Segers (2007), and Bellinger and Sigee (2010).

A total of nine phytoplankton taxa representing four divisions were recorded (Table 2-13**)**. Chlorophyta was the most abundant division with 44.44% of the total count, followed by Cyanophyta (37.04%). Bacillariophyta and Rhodophyta have 11.11% and 7.41% relative abundances, respectively. As seen in Figure 2-11, the two sampling stations have almost the same number of abundance and taxa.

Table 2-13: Phytoplankton composition and Abundance on Sampling Stations

Taxa	SITE		Grand Total	Relative Abund (%)
	FWE1 (cells/L)	FWE2 (cells/L)		
Bacillariophyta	**2**	**1**	**3**	11.11%
Flagilaria sp.	0	1	1	3.70%
Navicula sp.	2	0	2	7.41%
Chlorophyta	**6**	**6**	**12**	44.44%
Microspora sp.	4	4	8	29.63%
Tetraedron sp.	2	2	4	14.81%
Cyanophyta	**5**	**5**	**10**	37.04%
Coleodesmium sp.	1	0	1	3.70%
Nostochopsis sp.	2	1	3	11.11%
Oscillatoria sp.	2	4	6	22.22%
Rhodophyta	**1**	**1**	**2**	7.41%
Total Abundance (N)	14	13	27	100.00%
Mean Abundance ≈ 16				
Number of Taxa	7	6		
Total No. of Taxa = 10				

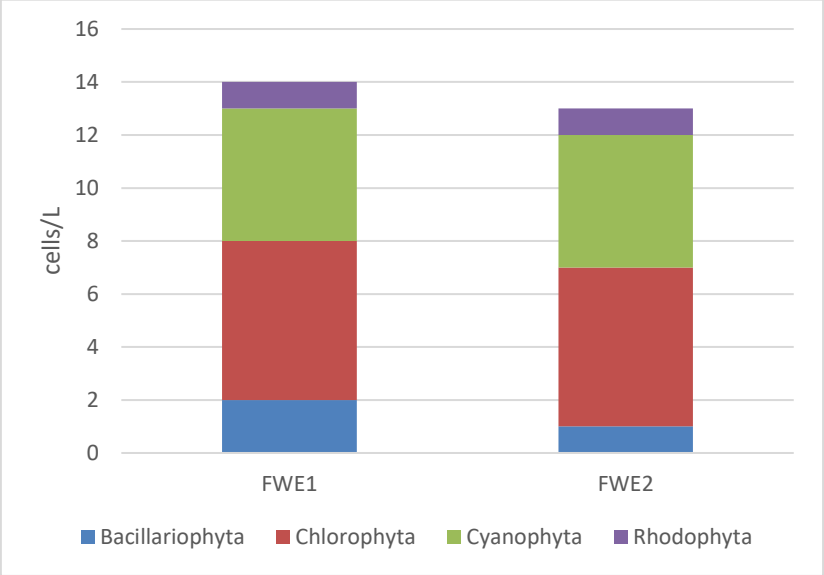


Figure 2-11: Phytoplankton Density Comparison on Phyla

2.3.4.3 Zooplankton

Zooplankters, tiny creatures, play a critical role in aquatic food webs. They are the main consumers and react significantly to changes in the environment. A few species are vulnerable to variations in temperature, pH, nitrogen cycle, and other environmental factors. Because zooplankters respond differently to different environmental dynamics, they are useful bioindicators that are frequently employed to quantify the effects of disturbances on aquatic ecosystems. Because of their small size, high diversity, and abundance, they are excellent bioindicators. According to Lazo et al. (2009), they are important connections between phytoplankton and fish in riverine food webs. For this study, no zooplankton was observed at the sampling stations.

2.3.4.4 Marine Ecology

2.3.4.4.1 Plankton

Plankton plays a pivotal role in marine ecology, supporting the entire marine food web, contributing to carbon sequestration and oxygen production, and serving as critical indicators of environmental changes. Monitoring the plankton community is essential for understanding the health and dynamics of marine ecosystems, evaluating the impacts of environmental changes, and informing conservation and management efforts to protect these vital ecosystems.

To determine the environmental impacts of dredging activities on plankton communities in marine ecosystems, water samples from the sampling stations from Baco, Oriental Mindoro (Table 2-14) were collected in July 2023. The collected samples were preserved with Lugol's solution and transported in a laboratory in Los Baños, Laguna for analysis.

Table 2-14: Location and geographical coordinates of sampling stations for the marine ecology assessment.

Sampling Station	Location	Coordinates	
		Latitude	Longitude
MS1	Longos River Estuary	13°25'9.24"N	121° 6'22.67"E
MS2	Near the coastline between Alag River and Longos River	13°25'8.03"N	121° 5'54.01"E
MS3	Alag River Estuary	13°25'2.25"N	121° 5'22.83"E

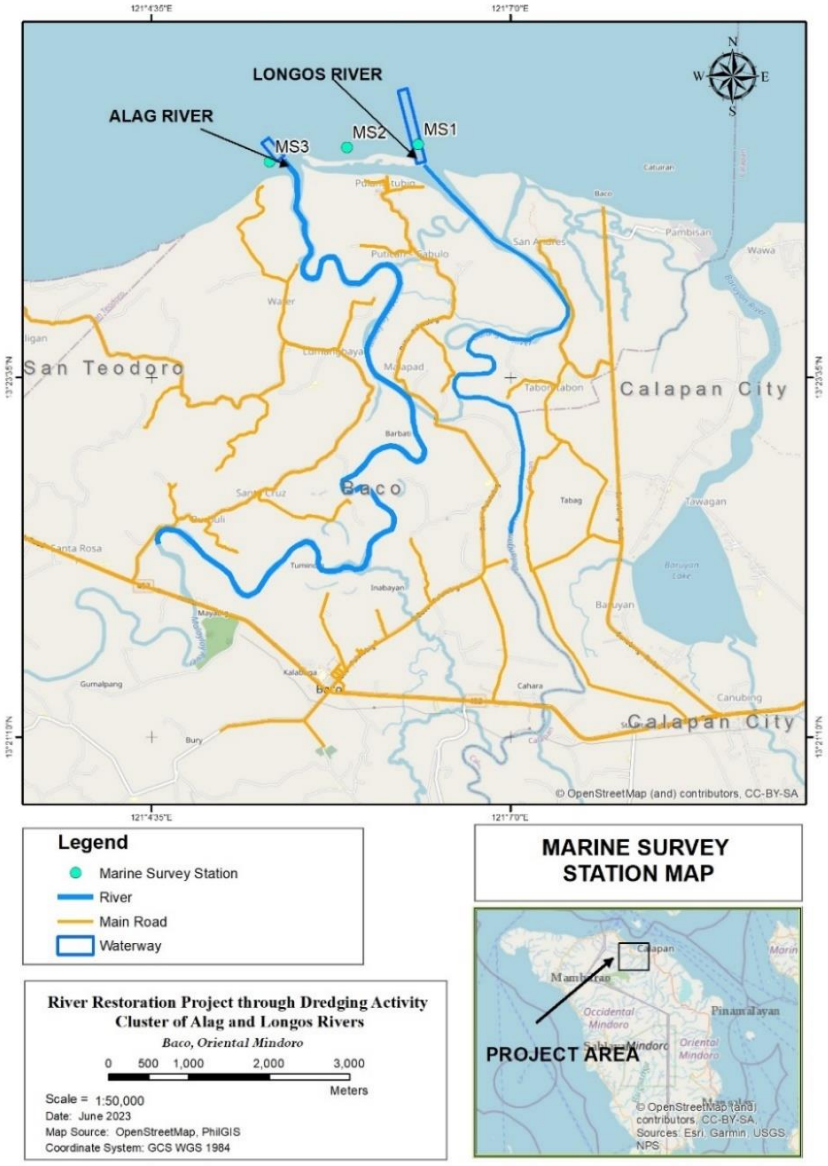


Figure 2-12: Marine Survey Station Map

2.3.4.4.2 Results

In all sampling stations, two main groups of phytoplankton were observed: Bacillariophyta and Cyanophyta. The Bacillariophyta, also referred to as diatoms, were found to be more dominant compared to Cyanophyta. Among the Bacillariophyta group, the three species recorded were *Chaetoceros* sp., *Melosira* sp., and *Rhizosolenia* sp. within the Cyanophyta, a group known as blue-green algae, *Cylindrospermopsis* sp., and *Trichodesmium* sp. were observed.

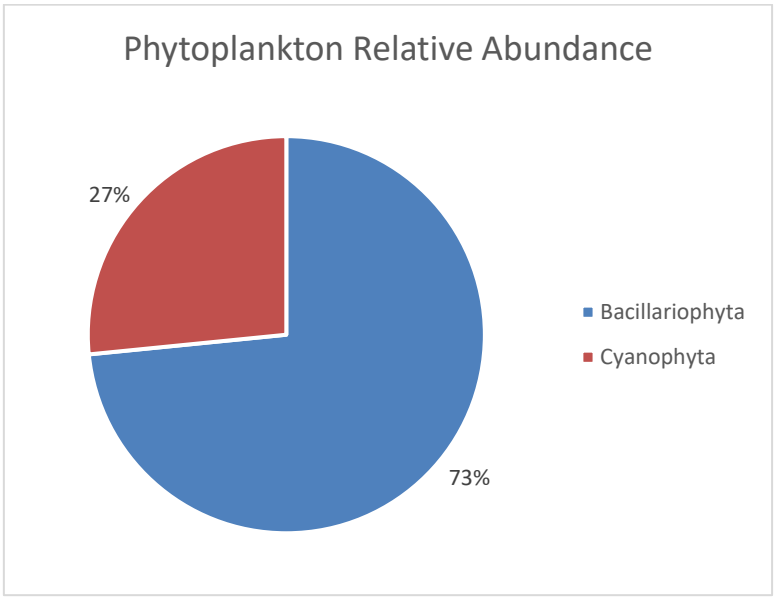


Figure 2-13: Relative Abundance of Phytoplankton Collected from Baco

Among the three sampling stations, the highest recorded density was in Station 1 with 23,767 cells/m^3. The other two, Stations 2 and Station 3 have relatively lower densities at 9,054 and 11,884 cells/m^3, respectively. The high density in Station 1 can be attributed to the dominance of *Melosira* sp. According to the studies of Davis (1964) and Zhao et al. (2013), the abundance of *Melosira* sp. may suggest high concentrations of nutrients in the water, particularly nitrogen. Its occurrence in Stations 1 and 3, both located at the estuaries, may indicate high nutrient loading in the downstream part of Alag River.

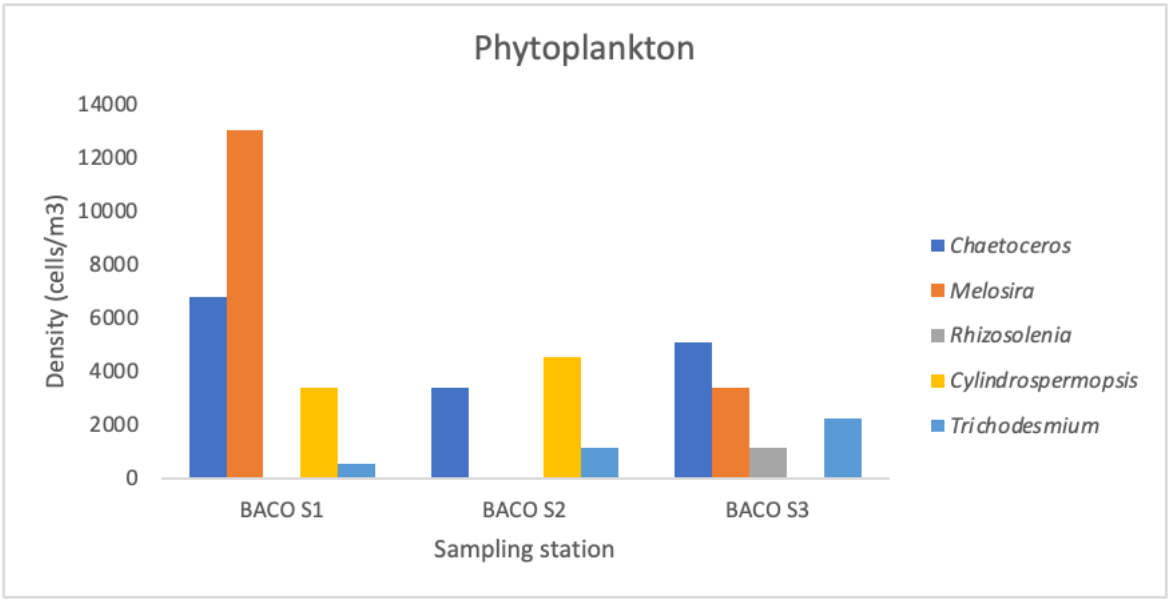


Figure 2-14: Phytoplankton Composition and Abundance

Table 2-15: Average Density of Phytoplankton Species

Phytoplankton (cells/m^3)	MS1	MS2	MS3
Chaetoceros	6791	3395	5093
Melosira	13015	0	3395
Rhizosolenia	0	0	1132
Cylindrospermopsis	3395	4527	0
Trichodesmium	566	1132	2264

The phytoplankton community in all sampling stations can be described as less diverse, with only a maximum number of taxa at 4 (Table 2-16). This can also be reflected in the Shannon and Simpson Diversity Indices with values ranging from 0.97 – 1.26 and 0.59 – 0.69, respectively.

Table 2-16: Phytoplankton Diversity

Diversity Index	MS1	MS2	MS3
Taxa_S (Richness)	4	3	4
Individuals	23767	9054	11884
Dominance_D	0.4025	0.4062	0.3106
Simpson_1-D	0.5975	0.5938	0.6894
Shannon_H	1.055	0.9743	1.261
Evenness_e^H/S	0.7178	0.8831	0.8821

The zooplankton recorded in sampling stations in Baco, Oriental Mindoro belong to Phylum Arthropoda (Figure 2-15). Copepoda nauplii are the dominant zooplankton in Stations 1 and 2 with the same density of 566 individuals/m^3. There was no zooplankton observed in Station 3. The absence of other taxa group in the sampling stations may be attributed to several factors such as seasonal variability, predation pressure, and environmental stressors.

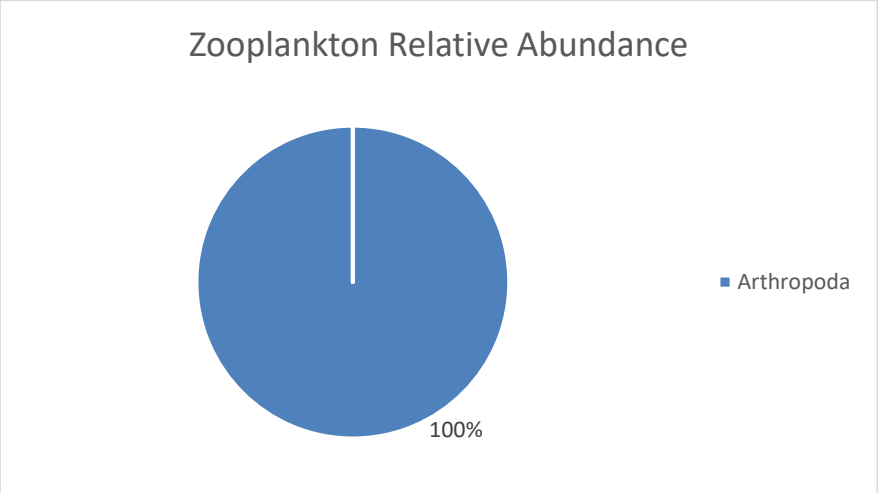


Figure 2-15: Relative Abundance of Zooplankton

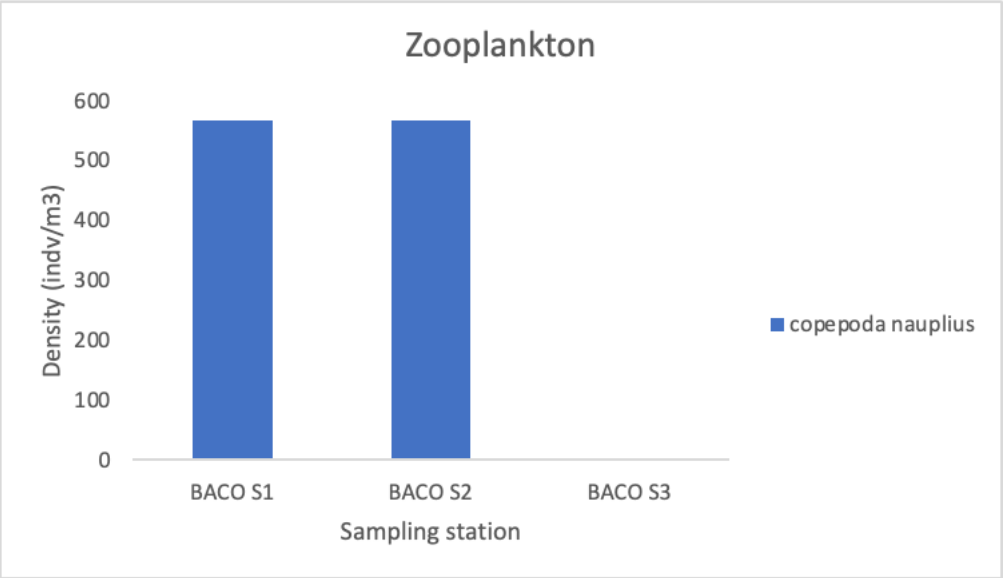


Figure 2-16: Zooplankton Composition and Abundance

Table 2-17: Average Density of Zooplankton Species

Zooplankton (indv/m3)	MS1	MS2	MS3
Arthropoda			
copepoda nauplius	566	566	

2.3.4.4.3 Phytoplankton

Figure 2-17: *Rhizosolenia sp.*

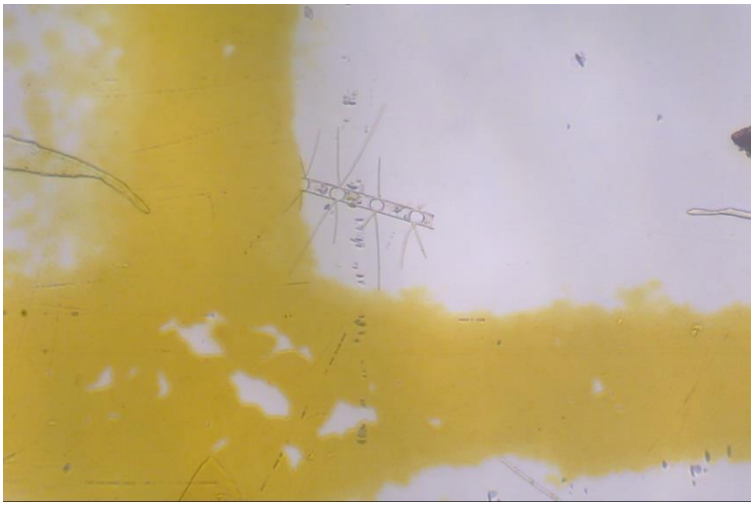


Figure 2-18: *Chaetoceros sp.*

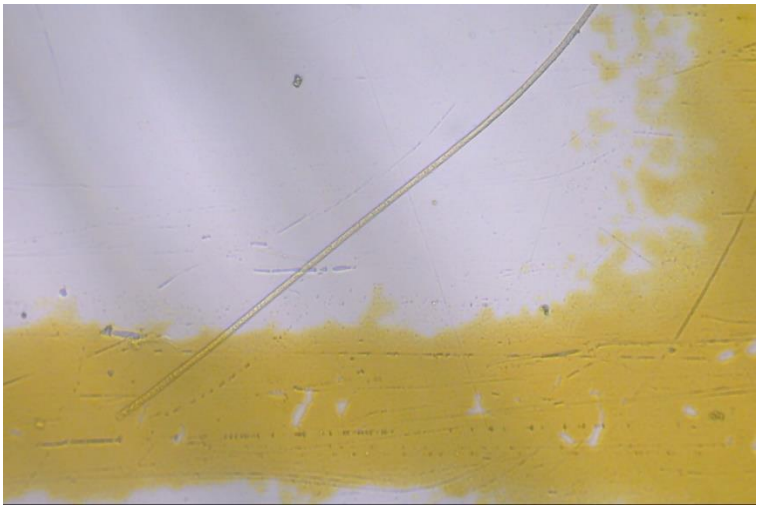


Figure 2-19: *Trichodesmium sp*.

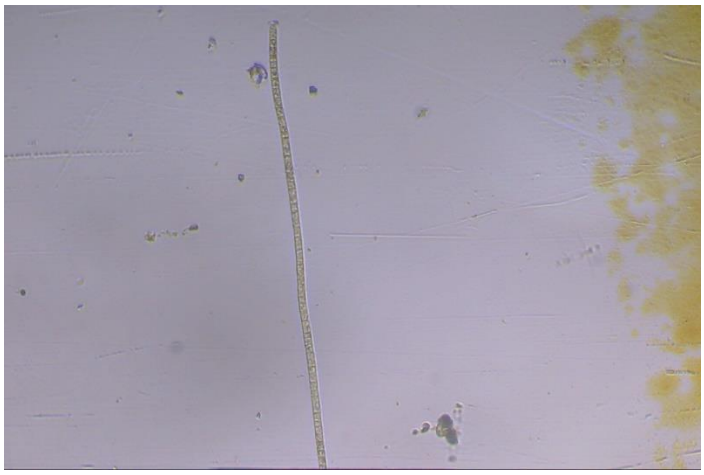


Figure 2-20: *Cylindrospermopsis sp.*

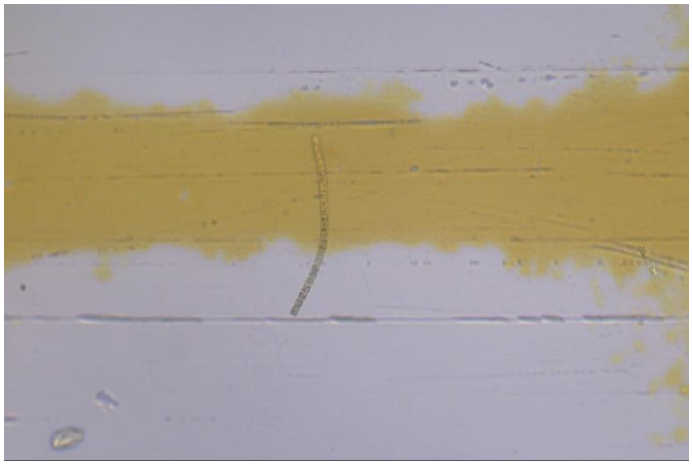


Figure 2-21: *Melosira sp.*

2.3.4.4.4 Zooplankton

Figure 2-22: *Copepoda nauplius*

2.3.4.4.5 Threat to Existence and/or Loss of Important Local Species and Habitat

Dredging activities are likely to result in the release of sediment streams, causing disturbance and stirring up loose mud and silt in the water. Although there are no corals in the coastal impact area, excessive sediment streams can increase water turbidity, potentially disrupting the feeding behavior and reproductive performance of plankton. High levels of water turbidity can also hinder photosynthesis, leading to the decline of microalgae, which can have negative consequences for the marine food chain. Furthermore, reduced photosynthetic function can negatively affect the microscopic primary producers like phytoplankton and dependent zooplankton communities. Additionally, turbid waters can contribute to a decline in the dissolved oxygen content of seawater.

2.3.4.4.6 Threat to Abundance, Frequency and Distribution of Species

The dredging activities of the proposed project could affect the abundance, frequency and distribution of plankton species. During the pre-dredging phase and mobilization of equipment, there may be incidence of contamination of oil and grease in the water due to leakage. The contamination may cause toxicity to free-swimming organisms such as plankton. Moreover, oil and grease can form a thin film on the surface of the water thereby reducing the oxygen transfer between the water and the atmosphere. The depletion in oxygen supply can lead to hypoxic or anoxic conditions which can disrupt feeding, reproduction, and overall health of these microscopic organisms.

During the dredging, removal of sediments from the seabed can cause physical disruption to the seafloor habitat. Planktonic organisms residing in or near the sediment can be directly affected by the disturbance, leading to changes in their distribution and abundance. Dredging can also resuspend fine particles and sediments in the water column, increasing water turbidity. Elevated turbidity reduces light penetration, affecting photosynthesis by phytoplankton. Moreover, dredging may release harmful contaminants from the sediments and resuspend it in the water column, potentially affecting the health and physiology of planktonic organisms.

2.3.4.4.7 Seagrass

Manta tow was conducted as a rapid assessment method to characterize the survey area and identify critical marine habitats present.

Manta tow was conducted at depths of 2-8 meters along Baco Station (Figure 2-23). Baco Station has a total of 15 survey points encompassing the three stations within Baco (BS1-Alag River, BS2-Longos River, and BS3-In between rivers).

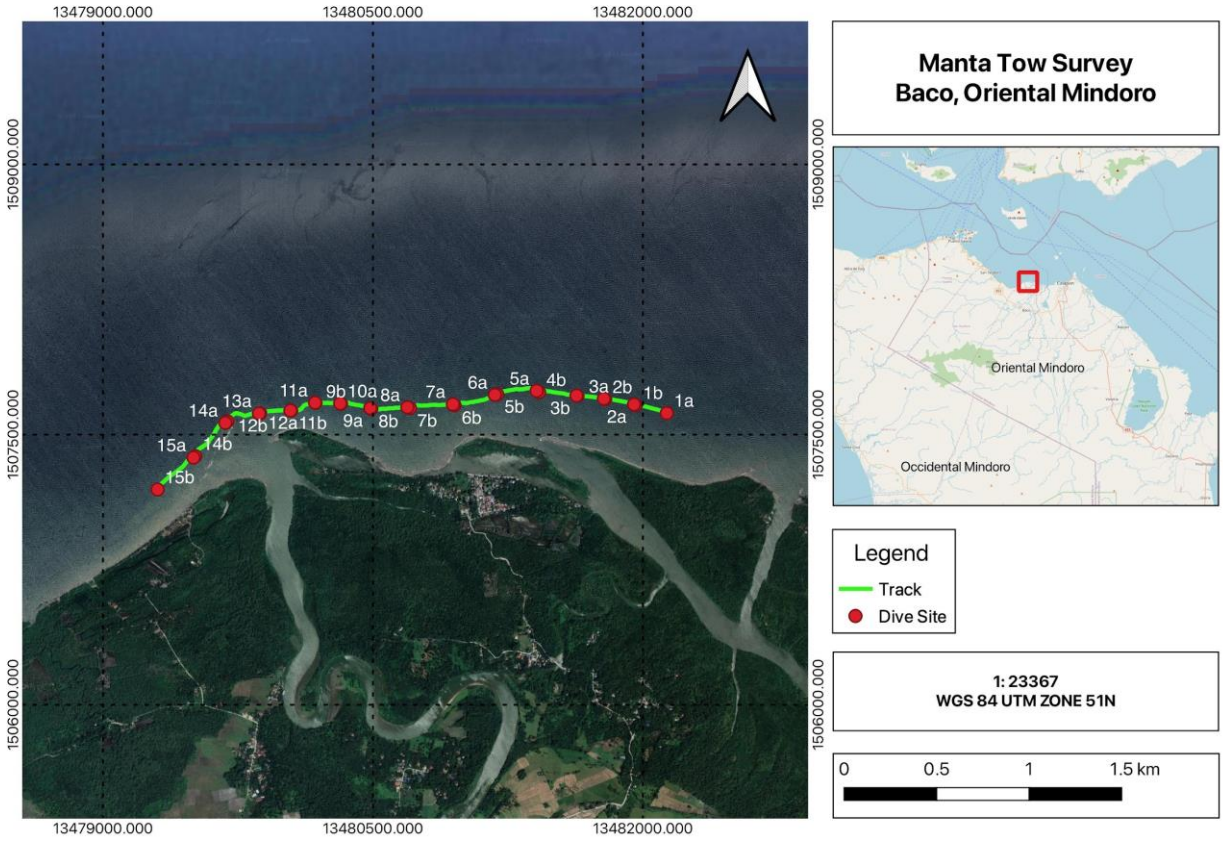


Figure 2-23: Map showing the 15 Survey Points of the Manta Tow along Baco Station
(a - start point of each site; b - end point of each survey point)

Manta tow results along the stations showed no presence of coral reefs.

Seagrass was present in stations of Alag River and Longos River but absent in between rivers. Alag River site is dominated by a single species of seagrass (Halodule uninervis).

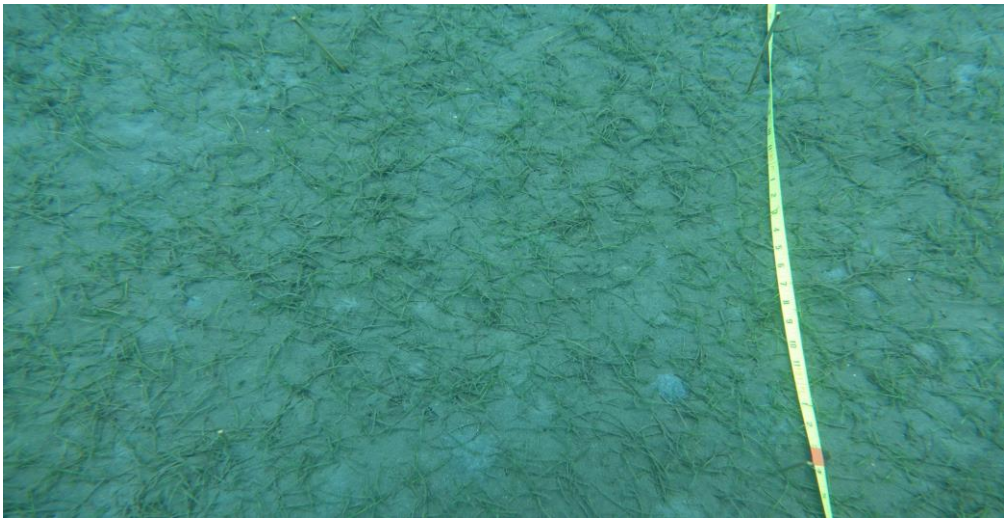


Figure 2-24: Seagrass (Halodule uninervis) bed in Alag River Station

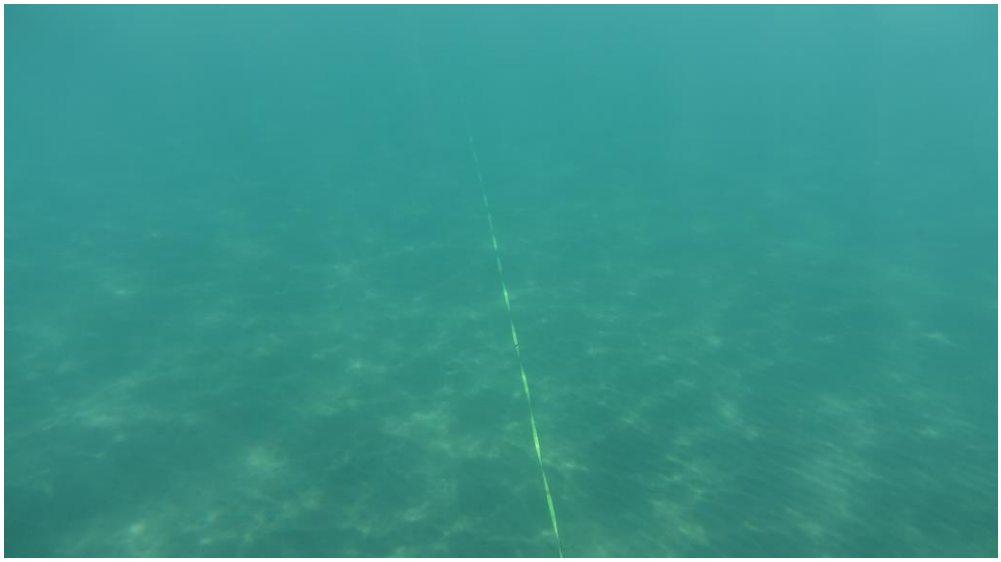


Figure 2-25: Vast sandy area in between Alag and Longos rivers

2.3.4.5 Fish

Interviews with fishermen and the recording of fish catches were used to get fish data. To ascertain the range and conservation status of the detected species, a cross-check is performed with the IUCN Red List. The largest group of vertebrates in freshwater environments are fish and it follows that before beginning any project, whether it be development or conservation, a thorough study of the fish fauna within that ecosystem is necessary for effective environmental management and catchment comprehension. Based on Table 2-18, there are a total of 11 fish species observed across the sampling locations. Fish caught in the open sea by local fishefolks and sold in the local market were also identified. Figure 2-26 to Figure 2-28 present the photos of fish sold at the local market in Baco.

Table 2-18 Taxonomic Profile, Distribution, and IUCN Red List Standing of the Fish Species

ORDER	FAMILY	SPECIES	LOCAL NAME (ENGLISH NAME)	ENDEMICITY/STATUS
Acanthuriformes	Siganidae	*Siganus sp.*	kitong, danggit, samaral (rabbitfish, spinefoot)	Least concern
Anguilliformes	Anguillidae	*Anguilla* sp.	igat (eel)	Not Evaluated

Carangiformes	Carangidae	*Caranx sp.*	maliputo, talakitok (jack, cavalla)	Least concern
Clupeiformes	Dorosomatidae	*Sardinella sp.*	tamban (sardinella)	Least concern
Mugiliformes	Mugilidae	*Moolgarda seheli*	banak (sea mullet)	Native / Least concern
Osmeriformes	Galaxiidae	*Neochanna* sp.	dalag (mudfish)	Native
Perciformes	Cichlidae	*Oreochromis* sp.	tilapia	Introduced
	Lutjanidae	*Lutjanus* sp.	mangagat (snapper)	Least concern
	Scombridae	*Rastrelliger kanagurta*	Alumahan (Indian mackerel)	Least concern
		Euthynnus affinis	Tulingan (Mackerel tuna)	Least concern
Siluriformes	Clariidae	*Clarias* sp.	hito (catfish)	Least concern

Figure 2-26: *Sardinella sp.* (Tamban)

Figure 2-27: *Rastrelliger kanagurta* (Alumahan)

Figure 2-28: *Euthynnus affinis* (Tulingan)

2.3.4.6 Fish Resouces

Based on the Oriental Mindoro Integrated Coastal Management Plan, among major fish species commonly caught in its waters include (in local terms) tanigue, tambakol, malasugi, mamsa, lapu-lapu, galunggong, tuna, herrings hasa-hasa, kalapato, caranx, dalagang-bukid, alumahan, bisugo, samaral, sardines, and anchovies. Table 2-19 shows the major marine species caught in the province over a 4-year period. In the year 2016, Frigate Tuna appears to be the most abundant species caught, followed by the Indian Sardines and by Round Scads. The same fish species were also the top 3 species caught in the years 2013-2015.

Table 2-19: Oriental Mindoro Major Marine Species, by Volume (mt), 2013-2016

VOLUME OF MAJOR MARINE SPECIES (metric tons)	2013	2014	2015	2016
Anchovies	547.11	600.65	666.85	503.07
Big-eyed scad	330.64	328.20	286.64	283.67
Bluecrab	37.96	34.39	30.34	23.06
Cavalla	158.25	144.06	119.01	118.45
Trevalle	105.93	110.57	46.63	39.39
Eastern little tuna	36.06	40.42	68.29	123.35
Fimbriated sardines	377.07	417.92	507.17	568.24
Frigate tuna	1,237.04	1,267.10	1,156.19	1,286.12
Grouper	90.68	58.40	63.17	36.82
Indian mackerel	653.31	688.94	700.31	589.48
Indian sardines	918.96	990.26	1,134.34	1,223.55
Indo pacific mackerel	141.11	142.01	141.25	137.25
Roundscad	1,536.13	1,579.90	1,655.67	1,153.06
Siganid	34.12	36.61	32.56	35.33
Skipjack	748.48	767.54	667.31	545.18
Slipmouth	427.37	471.95	442.75	325.52
Snapper	80.03	79.06	69.09	40.51

VOLUME OF MAJOR MARINE SPECIES (metric tons)	2013	2014	2015	2016
Spanish mackerel	71.54	64.33	50.08	35.05
Squid	462.85	519.95	489.38	476.39
Threadfin bream	412.69	414.63	337.55	266.30
Yellowfin tuna	577.51	624.12	443.77	312.97

Source: Philippine Statistics Authority, 2016

2.3.4.7 Threat to Existence and/or Loss of Important Local Species and Habitat

The proposed project is likely to result in resuspension of sediment causing increase in turbidity. High levels of water turbidity can hinder photosynthesis, leading to the decline of microalgae, which can have negative impact to the riverine food chain. Furthermore, reduced photosynthetic function can negatively affect the microscopic primary producers like phytoplankton and dependent zooplankton communities. Additionally, turbid waters can contribute to a decline in the dissolved oxygen content.

2.3.4.8 Threat to Abundance, Frequency and Distribution of Species

The proposed project can affect the abundance, frequency and distribution of plankton species. During the pre-dredging phase and mobilization of equipment, there may be incidence of contamination of oil and grease in the water due to leakage. The contamination may cause toxicity to free-swimming organisms such as plankton. Moreover, oil and grease can form a thin film on the surface of the water thereby reducing the oxygen transfer between the water and the atmosphere. The depletion in oxygen supply can lead to hypoxic or anoxic conditions which can disrupt feeding, reproduction, and overall health of these microscopic organisms.

During the dredging, removal of sediments can cause physical disruption to the riverbed habitat. Planktonic organisms residing in or near the sediment can be directly affected by the disturbance, leading to changes in their distribution and abundance. Dredging can also resuspend fine particles and sediments in the water column, increasing water turbidity. Elevated turbidity reduces light penetration, affecting photosynthesis by phytoplankton. Moreover, dredging may release harmful contaminants from the sediments and resuspend it in the water column, potentially affecting the health and physiology of planktonic organisms.

2.4 Noise

2.4.1 Methodology

Noise sampling was conducted on June 21, 2023. Four stations were established and distributed within the project area. Table 2-20 presents the location of the noise sampling stations.

Table 2-20: Noise Sampling Stations

Sampling Station	Location	Coordinates	
		Latitude	Longitude
N1	Near barangay hall of Brgy. Water	13°24'20.10"N	121° 5'33.86"E
N2	Near barangay hall ofBrgy. Lumangbayan	13°23'47.47"N	121° 5'50.86"E
N3	Near barangay hall of Brgy. Pulang Tubig	13°24'55.05"N	121° 6'9.92"E

2.4.2 Regulatory Setting

2.4.2.1 Ambient Noise Standards

The ambient noise standards that are stipulated in the NPCC have not been revised since its issuances in 1978 and 1980. The NPCC Memorandum Circular No. 002 Series of 1980, Section 78 – Ambient (Noise) Quality and Emission Standards for Noise have established the noise levels that should be attained in general areas (Table 2-21).

Table 2-21: Environmental Quality Standards for Noise in General Areas

Category	Maximum Allowable Noise (dBA) by time periods		
	Daytime (9:00 A.M. to 6:00 P.M).	Morning/Evening (5:00 A.M. to 9:00 AM/ 6:00 P.M. to 10:00 P.M.	Night time (10:00 P.M. to 5:00 A.M).
AA	50	45	40
A	55	50	45
B	65	60	55
C	70	65	60
D	75	70	65

- Class AA- a section of contiguous area which requires quietness, such as areas within 100 meters from school site, nursery schools, hospitals and special house for the aged
- Class A – a section of contiguous area which is primarily used for residential area
- Class B – a section of contiguous area which is primarily a commercial area
- Class C – a section of contiguous area reserved as light industrial area
- Class D – a section of contiguous area reserved for heavy industrial area

Table 2-22: Results of Noise Monitoring

Station	Location	Date / Time of Sampling	Noise Level* (dBA)	NPCC Standard [A]
N1	Near barangay hall of Brgy. Water	June 21, 2023 / 1130H-1230H	50	55
N2	Near barangay hall ofBrgy. Lumangbayan	June 21, 2023 / 1254H-1354H	51	55
N3	Near barangay hall of Brgy. Pulang Tubig	June 21, 2023 / 0905H-1005H	55	55

2.4.2.2 Impact Assessment and Mitigation Measures

Generation of noise emissions during operation is unavoidable, but mitigation measures to minimize or lessen generated noise should be considered in the environmental management and monitoring plan.

The following are the recommended noise control measures.

- Limit or restrict operation during nighttime, especially if the activiity are expected to generate high noise levels at residential areas.
- Require all equipment using internal combustion engines to install appropriate mufflers;

Noise monitoring should be conducted at households in close proximities to the project site. This aims to determine compliance with the ambient noise standards and to determine effectiveness of noise control measures.

2.5 People

This section will present an assessment of the socio-economic impact of the River Restoration Project ("the project") on the host communities. This report is based on the People Module of the Technical Scoping Checklist and is anchored on the guidelines set by PD 1586, Philippine Environmental Impact Statement System, DENR DAO 30-2003 Revised Procedural Manual, and DENR MC 005-14 Revised Guidelines for Coverage Screening and Standardized Requirements. While other sections of this study have focused on the geophysical, biological, and environmental conditions that are present in the vicinity of the Project, this section will delve into the impact the Project may have on the population of the host communities, the livelihoods of those residing in the impact barangays, their access to basic services, and how the people are able to meet their minimum basic needs. Measures to mitigate possible adverse impacts and enhance existing programs will be suggested for implementation upon undergoing the Environmental Management Bureau's (EMB) Assessment Review Process.

2.5.1 Methodology

The study area consists of thirteen barangays, which are all located in the Municipality of Baco, Province of Oriental Mindoro. The socioeconomic profile of these communities is presented and formed from the combination of primary and secondary data obtained through both quantitative and qualitative methods. Primary information was obtained through informal interviews and socioeconomic and perception surveys conducted in the first to third weeks of June 2023. The survey was conducted to develop an appreciation of the communities' perceived positive and negative impacts of the Project and to serve as a platform for the host communities to provide their suggestions and recommendations to the project proponent. On the other hand, secondary information used in the assessment is mostly from available local development plans and relevant literature, which includes Comprehensive Land Use Plans (CLUPs) and Socioeconomic and Physical Profiles (SEPPs). With the established baseline conditions, key socioeconomic impacts were identified, and mitigating and enhancement measures were formulated based on the following:

- In-migration and proliferation of informal settlers
- Threat to delivery of basic services and resource competition
- Threat to public health and safety
- Generation of local benefits from the project (Enhancement of employment and livelihood opportunities, Increased business opportunities and associated economic activities, and Increased revenue for LGUs)
- Traffic congestion

2.5.2 Baseline Condition

2.5.2.1 Demographic Characteristics

Baco is a coastal, third-class municipality situated in the northern portion of the province of Oriental Mindoro. It is composed of 27 barangays with a total land area of 31,126.02 hectares, which constitutes 5.10% of the province's total land area. These barangays comprise most of the forestland area of the municipality. The smallest barangay, with only 0.26 percent of the total land area of the municipality, is one of the thirteen barangays covered by the project, which is Pulang Tubig. According to the Philippine Statistics Authority (PSA), the Municipality posted a total population of 39,817 in 2020. This represented 4.38% of the total population of the province, or 1.23% of the overall population of the MIMAROPA Region. Based on these figures, the population density is computed at 184 inhabitants per square kilometer. It must be noted that of the total population in 2015, which was 37,215, an increase of 6.99% and an annual population growth rate of 1.43% were recorded.

Among the total household population in 2020, 20,463 (51.40%) were males, while 19,347 (48.60%) were females. In the same year, the household population of Baco was mostly comprised of an economically active population, roughly equivalent to the potential or active members of the workforce at 25,070, or 62.97% of the total household population. The overall dependency ratio of Baco, Oriental Mindoro, was computed at 59, which indicates that for every 100 working-age or

economically active people, there were about 59 dependents (50 young dependents and 9 old dependents). This is lower than the dependency ratio in 2015, which was recorded at 67 dependents per 100 working-age people (59 young dependents and 8 old dependents). Detailed population characteristics of Baco are summarized in Table 2-23**.**

Table 2-23: Population Characteristics of the Municipality of Baco

Key Profile Features	Municipality of Baco
Population (2020)	39,817
Population Change (2015-2020)	6.99%
Annual Population Growth Rate (2015-2020)	1.43%
Population Density (2020)	184 / km^2
Household Population (2020)	39,810
Number of Households (2020)	9,182
Average Household Size (2020)	4.3
Population Age Group (2020) • Under 1 – 14 • 15 – 64 • 65 and above	 12,469 25,070 2,271
Male Population (2020)	20,463
Female Population (2020)	19,347
Median Age (2020)	24.4
Total Dependency Ratio (2020)	59
Youth Dependency Ratio (2020)	50
Old Age Dependency Ratio (2020)	9

Source: Philippine Statistics Authority, 2015 and 2020

In reference to the 2015 census, Malapad posted the most significant increase at 13.23%, while Burbuli recorded a decrease of 12%. Aside from having the highest population count and number of households in 2020, Poblacion was also identified as having the highest percent share among the four host communities in the total population of Baco, at 7.18%. A summary of the demographic characteristics of the thirteen impact barangays is presented in **Table 2-24**.

Table 2-24: Population Characteristics of the Direct Impact Barangays

Profile Feature	Alag	Burbuli	Catwiran I	Lumang-Bayan	Malapad	Poblacion	Putican-Cabulo	Santa Cruz	Water
Population (2020)	**1166**	**594**	**1466**	**647**	**505**	**2860**	**502**	**2129**	**1588**
Population (2015)	**1198**	**675**	**1387**	**584**	**446**	**3021**	**473**	**1884**	**1467**
Population Change (2015-2020)	**-2.67%**	**-12.00%**	**5.70%**	**10.79%**	**13.23%**	**-5.33%**	**6.13%**	**13.00%**	**8.25**
Percent Share in the Municipal Population (2020)	**2.93%**	**1.49%**	**3.68%**	**1.62%**	**1.27%**	**7.18%**	**1.26%**	**5.35%**	**3.99**
Annual Population Growth Rate (2015-2020)	**-0.57%**	**-2.65%**	**1.17%**	**2.18%**	**2.65%**	**-1.15%**	**1.26%**	**2.61%**	**1.68**
Household Population (2020)	1166	**594**	**1466**	**647**	**505**	**2860**	**502**	**2129**	**1588**
Number of Households (2020)	**321**	**154**	**325**	**155**	**108**	**661**	**121**	**492**	**372**

Source: Philippine Statistics Authority, 2015 and 2020

Indigenous People Community

Two dominant indigenous people communities are present in the Municipality of Baco: the *Alangan and Iraya of Mangyan* tribe. A large population of these groups resides in the mountainous areas of Baco, where lands are tenured under Certificate of Ancestral Domain Claim (CADC) 124 and CADC 126 (**Figure 2-29**). CADC 124 encompasses the Municipalities of Naujan, San Teodoro, and Baco. This tenured land covers a total of 19,312.68 hectares, or about 62.05 percent of the total forestland area of the municipality, covering the barangays of Lantuyang, San Ignacio, and Bayanan. On the other hand, CADC 126 encompasses the municipalities of Baco, San Teodoro, and Puerto Galera. It covers 1,510.54 hectares, or only 4.85 percent of the total forestland area of the municipality, specifically in Barangays Baras, Mangangan I, and Bayanan. Some areas under CADC 124 and CADC 126 are also situated in alienable and disposable lands, constituting 1,359.01 hectares and 670.24 hectares, respectively. It must be noted that the existing CADC in the Municipality is not located within any of the thirteen project-impact barangays.

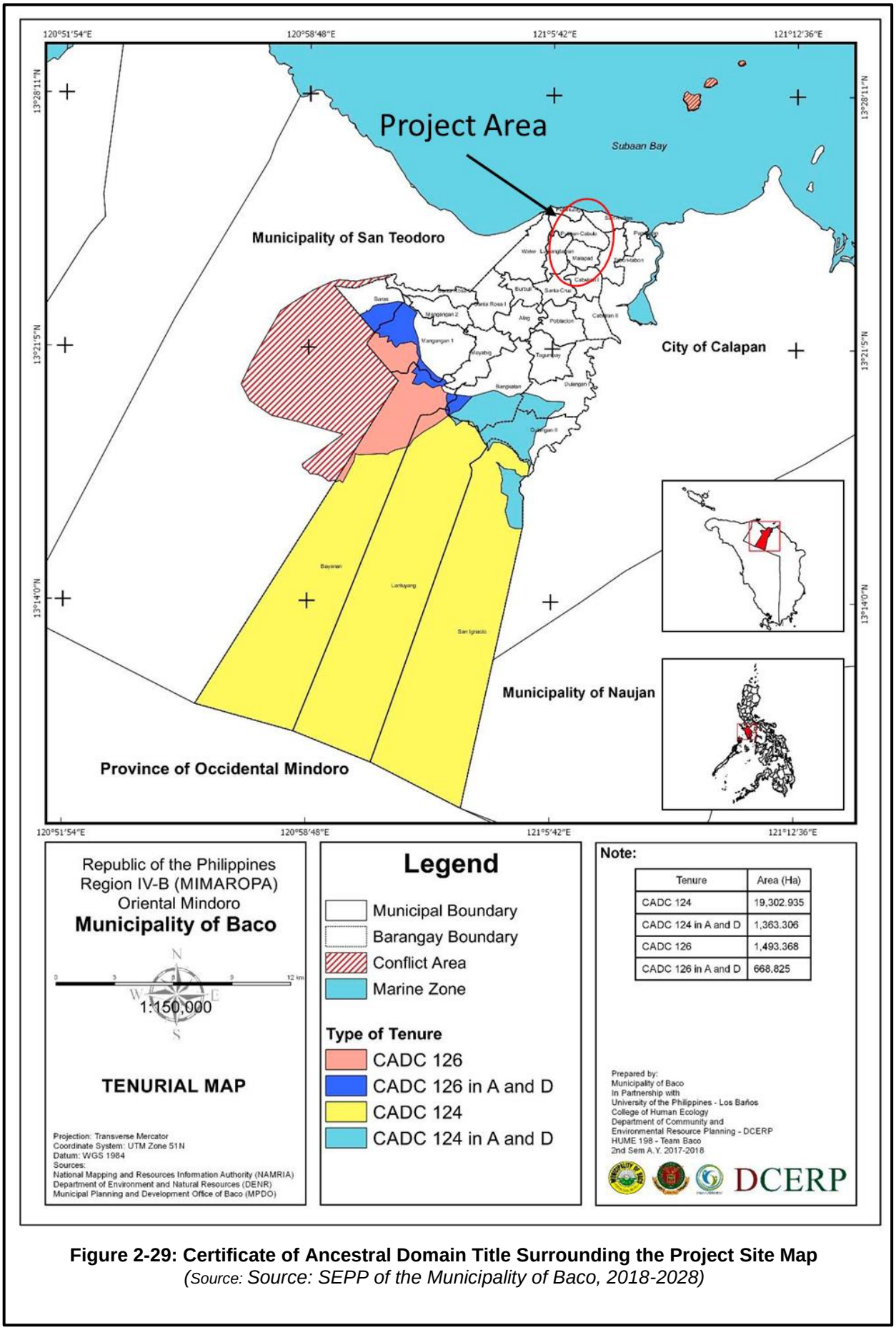


Figure 2-29: Certificate of Ancestral Domain Title Surrounding the Project Site Map
(Source: Source: SEPP of the Municipality of Baco, 2018-2028)

Language and Religion

In terms of socio-cultural profile, Baco is predominantly a Tagalog-speaking locale. According to Baco's SEPP, a significant number of the total population belongs to the Roman Catholic sect of the Christian religion, followed by the Evangelicals and the Iglesia ni Cristo. In addition, the whole municipality has a total of 104 religious' establishments, 53 of which are for Roman Catholics. Apart from their religious purposes, 48 of these establishments are also useful as evacuation centers during calamities and disasters.

2.5.2.2 Education

Literacy and Enrollment Rates

According to the SEPP of Baco, the Municipality's literacy rate in 2015 was recorded at a promising rate of 95.71%. The male population had a literacy rate of 95.73% in the same year, which implies that 13,818 of the 14,434 males could read and write. Similarly, 95.69% of the female population is considered literate. Moreover, from 2014 to 2017, there was an overall increase in the number of students enrolled in elementary and secondary schools. In 2016, both levels showed a significant decline in terms of enrollment. The 6,069 enrollments in the previous academic year declined by nearly half for the elementary level, while enrollment at the secondary level decreased by 45.49% (Table 2-25). The decrease in enrollments in 2016 can be attributed to the impact caused by Typhoon Nona, which devastated Baco. Some schools, particularly those in low-lying areas, were seriously affected by the typhoon, which destroyed and damaged various educational facilities, impacting enrollment in the schools.

Table 2-25: Historical Enrollment in Elementary and High School in the Municipality of Baco for the Past Five School Years, Year 2013-2017

Level	Year									
	2013		2014		2015		2016		2017	
	M	F	M	F	M	F	M	F	M	F
Elementary	3216	2743	3152	2738	3159	2764	1516	1300	2946	2583
Secondary	1108	1085	1168	1152	1215	1187	449	423	1352	1307

Source: Department of Education, 2018

School Facilities

A total of 42 schools (public and private) were actively operating in the Municipality, serving the school-going population of Baco. Among these facilities, only seven cater to secondary-level education. Aside from the respective daycare centers, there are 17 schools (public and private) present in the thirteen impact barangays. The list of schools within the impact barangays is enumerated in Table 2-26.

Table 2-26: Inventory of Existing Schools in the Impact Barangays

Name of School	Location	Type
Elementary		
Benito Villar Memorial School	Poblacion	Public
Burbuli Elementary School	Burbuli	Public
Felix Hernandez Memorial School	Alag	Public
Sta. Cruz Elementary School	Sta. Cruz	Public
Catwiran I Elementary School	Catwiran I	Public

Lumang Bayan Elementary School	Lumang Bayan	Public
Malapad Elementary School	Malapad	Public
Putican Elementary School	Putican Cabulo	Public
Water Elementary School	Water	Public
Baco Catholic School	Poblacion	Private
Secondary		
Baco National High School	Poblacion	Public
Lumang Bayan National High School	Lumang Bayan	Public
Baco Catholic School	Poblacion	Private

Source: SEPP of the Municipality of Baco, 2018-2028

There is only one tertiary institution in the municipality, the Baco Community College (BCC), and two technical or vocational schools, the Baco Technical Vocational institution (BTVS) in Barangay Poblacion, both of which were established in 2014. During the height of the COVID-19 pandemic, the country implemented an Enhanced Community Quarantine (ECQ) on March 16, 2020 to slow down the spread of virus. This has affected the face-to-face educational set up of Primary, Secondary, and Tertiary Schools in the country. The Department of Education (DEPED) and Commission on Higher Education (CHED) implemented the blended learning mode of learning through online class meetings and printed modules.

2.5.2.3 Health

Health Facilities and Personnel

The Baco Rural Health Unit (RHU), located in Barangay Poblacion, generally caters to the public's health concerns through the services provided by healthcare personnel such as doctors, nurses, midwives, sanitary inspectors, and other health workers. As of 2017, only three out of 27 barangays in Baco have established Barangay Health Stations (BHS). The rest of the barangays utilize their multipurpose halls and other barangay facilities for health-related activities and projects.

Aside from the mentioned medical practitioners, there are also Barangay Health Workers (BWH) and Barangay Nutrition Scholars (BNS) actively operating in each barangay. These health personnel manage the medical complaints, provide first aid treatment, and carry out the health programs of the DOH for the residents. Those patients who are in need of further evaluation and management are referred to the Rural Health Unit in the town proper. Patients who are critically ill or require more diagnostic work-up are referred to bigger and better equipped hospitals in nearby towns.

Table 2-27: Medical Facilities and Personnel in the Impact Barangays, 2016

Barangay	Type of Health Facility	Ownership	Personnel					
			Doctors	Nurses	Midwives	Sanitary Inspector	Others	Total
Poblacion	Rural Health Unit	Public	MHO-1 DTTB1	Nurse II-1 NDP-8 PHA-1 UHCI-1 TB Aider-1	RHM-6 RHMPP-3	1	Med Tech-1 AAVI-1 AAI-1 Ambulance Driver-4 Dentist-1	32
Alag	Multipurpose Hall	Public	Referred to RHU				BNS-1 BHW-9	10

Burbuli	Multipurpose Hall	Public	Referred to RHU	BNS-1 BHW-8	9
Catwiran I	Multipurpose Hall	Public	Referred to RHU	BNS-1 BHW-10	11
Lumang Bayan	Daycare Center	Public	Referred to RHU	BNS-1 BHW-4	5
Malapad	Multipurpose Hall	Public	Referred to RHU	BNS-1 BHW-5	6
Putican Cabulo	Health Station	Public	Referred to RHU	BNS-1 BHW-5	6
Sta. Cruz	Multipurpose Hall	Public	Referred to RHU	BNS-1 BHW-11	12

Source: SEPP of the Municipality of Baco, 2018-2028

Note: "AAVI"- American Association of Veterinary Immunologist; "BNS"- Barangay Nutrition Scholar; "BHW"- Barangay Health Worker; "DTTB"- Doctor to the Barangay; "MHO"- Municipal Health Officer; "NDP"- Nurse Development Program; "RHM"- Rural Health Midwife; "RHMPP"- Rural Health Midwife Placement Program; "UHCI"- Universal Health Care Implementers

COVID-19 manifested in the country, including Baco, in 2020. Healthcare workers, or the so-called frontliners, have undergone several capacity trainings in handling and managing the said virus. The LGU of Baco strictly implemented the necessary measures to prevent the virus from entering its premises, yet cases have been raised. The Municipality has established its proactive measures to combat the virus, which include the preparation of facilities, vehicles, and human resources to be utilized during lockdown, testing, and management of COVID-19 patients to minimize health risks for the residents.

Leading Causes of Mortality and Morbidity

According to the Municipal Health Office of Baco, acute respiratory infection and senility were the leading causes of morbidity and mortality in the entire Municipality in 2017, respectively (Table 2-28). Moreover, another common cause of morbidity in the municipality is essential hypertension, with 425 cases, while third on the list is acute febrile illness, or acute fever. In terms of recorded deaths, the second leading cause is undetermined natural phenomena, with nine reported deaths, and then cancer, with eight cases of deaths.

Table 2-28: Leading Causes of Morbidity and Mortality in the Municipality of Baco, 2017

Morbidity		Mortality	
Causes	**Number of Cases**	**Causes**	**Number of Cases**
Acute Upper Respiratory Infection	946	Senility	13
Essential Hypertension	425	Undetermined Natural Cause	9
Acute Febrile Illness	303	Cancer	8
Pulmonary Tuberculosis	204	Cardiovascular Accident Hypertension Community Acquired Pneumonia	5 5 5 5
Dermatitis	203	Acute Myocardial Infection Severe Hemorrhage due to hacking incident	4 4
Urinary tract infection	109	Aspiration Pneumonia due to drowning Malnutrition Disability Diabetes Mellitus Pneumonia Intestinal Obstruction due to Pyloric	3 3 3 3 3 3

		Stenosis	3
Vertigo	175	Pulmonary Tuberculosis Anemia Electric shock	2 2 2
Open wound	169	Alcoholism Still birth Yolk sac tumor Infant Sudden death Congestive Heart Failure Status Asthmaticus Meningitis Multiple organ system damage Coronary artery	1 1 1 1 1 1 1 1
Headache	135	Asphyxiation by hanging	1
Diabetes Mellitus	111	Peptic Ulcer Disease Acute Kidney Injury Sudden Death	1 1

Source: SEPP of the Municipality of Baco, 2018-2028

2.5.2.4 Water and Sanitation

Access to Potable Water Sources

For Level I point sources of water, many barangays and households in Baco rely largely on groundwater. There are also a few houses that depend on springs for their daily water requirements. Level II community sources in Baco include communal pumps and faucets. These are typically found in densely populated barangays, with shared pumps and faucets serving several households. Furthermore, Baco has several Level III water systems, including the Pag-Asa Water System, the Bangkatan Water System, the Dulangan III Water System, the San Ignacio Water System, and the Barangay Water System. Gravity-fed water facilities are available in all of these Level III water systems. The summary of the impact barangays' access to potable water is summarized in **Table 2-29**.

Table 2-29: Access to Potable Water of the Impact Barangays, 2016

Barangay	Total Number of Population	Total Number of Households	Households with Access to Safe Water								
			Level I	No.	%	Level II	No.	%	Level III	No.	%
Alag	1244	288	288	288	100	0	0	N/A	0	0	N/A
Burbuli	720	174	60	174	100	0	0	N/A	0	0	N/A
Catwiran I	1478	345	270	345	100	0	0	N/A	0	0	N/A
Lumang Bayan	660	135	73	135	100	0	0	N/A	0	0	N/A
Malapad	480	100	833	100	100	0	0	N/A	0	0	N/A
Poblacion	3229	703	441	441	62.73	0	0	N/A	0	262	37.27
Putican Cabulo	516	107	3	107	100	0	0	N/A	0	0	N/A
Sta. Cruz	2157	459	314	459	100	0	0	N/A	0	0	N/A
Water	1750	364	11	78	21.43	8	231	63.46	1	55	15.11

Notes:
a. Level I – Point sources such as rain collector, wells and springs; b. Level II – Communal Faucet Systems;

c. Level III – Local Waterworks system (HLURB,2007)
Legend: No. - Number of Households; % - Percentage of Households; N/A – Not Applicable

Source: Municipal Health Office, 2018

Access to Sanitary Toilets

As of 2016, the majority, or 74.75%, of households have access to sanitary toilets. However, in some barangays such as Baras, Bayanan, Lantuyang, and San Ignacio, there are still more households without sanitary toilets than those who have. It must be noted that these barangays are known to be inhabited by the Mangayan Tribe. **Table 2-30** presents the number of households within the impact barangays with and without access to sanitary toilet facilities in 2016.

Table 2-30: Number of Households by Type of Toilet Facilities, 2016

Barangay	Population	Households		
		Total Number	With sanitary toilet	Without sanitary toilet
Alag	1,244	288	271	17
Burbuli	720	174	98	76
Catwiran I	1,478	345	300	45
Lumang Bayan	660	135	128	7
Malapad	480	100	89	11
Poblacion	3,229	703	632	71
Putican Cabulo	516	107	89	18
Sta. Cruz	2,157	459	365	94
Water	1,750	364	330	34
Total	**12,234**	**2,675**	**2,302**	**373**

Source: SEPP of the Municipality of Baco, 2018-2028

2.5.2.5 Power

The Oriental Mindoro Electric Cooperative (ORMECO) provides power to the entire municipality. However, not all households in all barangays have access to a power supply. In 2017, 19 out of 27 barangays, namely Bangkatan, Bayanan, Burbuli, Dulanngan I, Dulangan II, Lantuyang, Lumang Bayan, Malapad, Mangangan I, Mangangan II, Mayabig, Pulantubig, San Andres, San Ignacio, and Sta. Cruz, Sta. Rosa I, Tabon Tabon, Tagumpay, and Water still have households unserved by ORMECO. The detailed number of households within the impact barangays enjoying the service provided by ORMECO is summarized in **Table 2-31.**

Table 2-31: Households Served by ORMECO in the Impact Barangays, 2017

Barangay	2017				
	Total HH	Served		Unserved	
		No.	%	No.	%
Alag	279	338	121.15	N/A	N/A
Burbuli	152	122	80.26	30	19.74
Catwiran I	314	352	112.10	N/A	N/A
Lumang Bayan	144	120	83.33	24	16.67
Malapad	103	86	83.50	17	16.50
Poblacion	679	1114	164.06	N/A	N/A
Putican Cabulo	107	124	115.89	NA	NA
Santa Cruz	477	457	95.81	20	4.19
Water	347	294	84.73	53	15.27

Source: SEPP of the Municipality of Baco, 2018-2028

2.5.2.6 Communication

As of 2018, there were no existing telephone service providers or public calling stations in the municipality. Postal services offered by the Philippine Post (PHILPOST) are located on the second floor of the Municipal Hall in Barangay Poblacion. There are also two cellular site networks present in Baco, namely Globe Telecom and Smart Communications. However, these private companies do not offer any internet services in the locale. Various television networks available in the Municipality include Tamaraw Vision Network, Inc. (TVNet), Cignal TV, Dream, and Sky Direct. However, only Cignal TV has a store in Barangay Poblacion.

Other means of communication, such as newspapers, magazines, and other printed media, are also in circulation. In Oriental Mindoro, 11 newspapers are distributed within the coverage of the whole province and the Southern Tagalog region. However, the only print media distributed annually are those from the Provincial Government of Oriental Mindoro, *"Mindanao Bago Sarili",* and the LGU of Bacok, *"Budyong."*

2.5.2.7 Road Network and Transportation

Roads and Bridges

Baco has a total road network of 223.34 kilometers. These roads are classified as national, provincial, municipal, and barangay. All national and 70.88% of provincial roads have been concreted. However, only 2.52 percent of the barangay roads are concrete, 90.06% of which are still gravel, and 7.07% remain to be classified as earth road surfaces. An inventory of roads by system classification and length within Baco is summarized in Table 2-32.

Table 2-32: Inventory of Road by System Classification

Road Name	Total Length (km)
National Road	
Alag to Calapan City	1.84
Catwiran II to Calapan City	0.99
Poblacion to Calapan City	2.44
Sta. Rosa I to Calapan City	1.94
Sta. Rosa II to Calapan City	0.48
Provincial Road	
Baras to National Road	1.44
Burbuli to National Road	1.46
Bangkatan to National Road	7.33
Catwiran I to National Road	4.74
Catwiran II to National Road	0.08
Dulangan I to National Road	5.55
Dulangan II to National Road	3.58
Lumangbayan to National Road	1.99
Malapad to National Road	2.00
Mangangan I to National	3.98
Mangangan II to National Road	4.83
Mayabig to National Road	2.18
Pambisan to National Road	1.23
Poblacion to National Road	0.20
Pulantubig to National Road	0.47
Putican Cabulo to National Road	1.78
San Andres to National Road	0.58
San Ignacio to National Road	3.54
Sta. Cruz to National Road	1.44
Sta. Rosa I to National Road	1.83

Sta. Rosa II to National Road	4.86
Tabon Tabon to National Road	2.89
Tagumpay to National Road	3.26
Water to National Road	4.32
Municipal	
Poblacion to National Road	2.54
Barangay	
Alag to National Road	1.29
Burbuli to National Road	0.33
Poblacion to National Road	0.81
Sta. Rosa I to National Road	3.75
Malapad to Provincial Road	2.34
Mangangan I to Provincial Road	16.09
Mangangan II to Provincial Road	2.17
Mayabig to Provincial Road	8.09
Pambisan to Provincial Road	0.95
Poblacion to Provincial Road	3.77
Pulantubig to Provincial Road	1.80
Putican Cabulo to Provincial Road	0.43
San Andres to Provincial Road	1.28
San Ignacio to Provincial Road	9.59
Sta. Cruz to Provincial Road	3.69
Sta. Rosa I to Provincial Road	2.42
Sta. Rosa II to Provincial Road	6.67
Tabon Tabon to Provincial Road	4.30
Tagumpay to Provincial Road	6.64
Water to Provincial Road	3.89

Source: SEPP of the Municipality of Baco, 2018-2028

As of 2018, there were 15 existing passable bridges in Baco. Thirteen out of 15 bridges are concreted and located on national and provincial roads. The two steel bridges are located within barangays Mangangan I and Catwiran I. However, six out of 15 bridges are in poor and critical condition. These bridges are located within and between barangays, while bridges that are in fair condition are located on provincial and national roads. The inventory of bridges by location, type, capacity, and condition is presented in Table 2-33.

Table 2-33: Inventory of Bridges by Location, Type, Capacity and Condition, 2018

Bridge Name	Barangay	Type	Load Capacity (Tons)	Physical Condition
Casilihan I Bridge	Dulangan I and Catwiran II	Concrete	20T	Poor
Casilihan II Bridge	Dulangan I and Catwiran II	Concrete	20T	Fair
Baguin I Bridge	Poblacion	Concrete	20T	Fair
Baguin II Bridge	Poblacion	Concrete	20T	Fair
Calabugao Bridge	Poblacion	Concrete	20T	Fair
Matining Bridge	Poblacion	Concrete	20T	Fair
Alag Malaki	Alag	Concrete	15T	Poor
Sta. Rosa I Bridge	Sta. Rosa I	Concrete	-	Fair

Binaybay Bridge	Sta. Rosa II	Concrete	-	Poor
Malapad Bridge	Malapad	Concrete	-	Fair
Putican Cabulo Bridge	Putican Cabulo	Concrete	-	Poor
Putican Cabulo Bridge II	Putican Cabulo	Concrete	-	Critical
Mangangan I Pres. Bridge	Mangangan I	Steel	-	Critical
Casalon A	Catwiran II	Steel	-	Fair
Sitio Embargo Bridge	Catwiran I	Concrete	-	Fair

Source: SEPP of the Municipality of Baco, 2018-2028

Mode of Transportation

Baco may be reached via various modes of transportation, including air, sea, and land, from regions in Luzon, Visayas, and Mindanao. Flight service is available from an airport in Calapan City, followed by a 15-minute drive. Baco is also accessible from Manila via Batangas City Port. Regular roll-on/roll-off (ro-ro) vessels with an expected trip time of three hours and fast crafts with an estimated travel time of one hour are also actively operating from the Batangas Port to Baseport in Calapan City. There are multi-cabs and jeepneys which travel from Calapan to Baco and Calapan to Puerto Galera from the Calapan City Baseport. The terminal facility in Calapan Public Market serves jeepneys traveling directly to Baco and indirectly through San Teodoro or Puerto Galera. Tricycles are the most popular means of transportation among residents in the municipality.

During the height of the COVID-19 pandemic, the transportation sector and its underlying operations were greatly affected. The government banned all travel outside and inside the municipality unless concerns were about health and well-being. The sudden stoppage of travel affected the livelihood of owners and operators as well as business movement in the area.

2.5.2.8 Peace, Order, and Safety

Protective Services and Equipment

All the main protective services are located in Barangay Poblacion. The police headquarters, with an area of 34 square meters, have a fair physical condition and offer a jail facility with only two cells. There are also headquarters for fire officers, with a total area of 400 square meters, in good condition, and a total of seven personnel. Table 2-34 shows the protective services provided by facilities and equipment that exist in the municipality.

Table 2-34: Protective Services by Facilities and Equipment, 2018

Type of Services	Barangay	Area (m^2)	Physical Condition of Facility	Personnel	Personnel to Population Ratio	Vehicles	
						No.	Types
Police							
Headquarters	Poblacion	34	Fair	34	1:1,134	2	Motorcycle Patrol
Outpost		4	Poor				
Jail		10	Fair				
Fire Protection							
Headquarters	Poblacion	400	Good	7	1:5,508	1	Fire Truck

Source: SEPP of the Municipality of Baco, 2018-2028

Barangay Security Force and Volunteers

Aside from the protective services provided by the national and local governments, all barangays in Baco have tanods and volunteers who also help in maintaining the locality's peace, order, and safety. Table 2-35 summarizes the barangay personnel complementing the services provided by the Municipality of Baco.

Table 2-35: Barangay Security Force and Volunteers by Type of Service, 2018

Type of Services	Number of Security Force Volunteer	Facilities or Equipment	Condition of Facilities or Equipment
Traffic/Peace and Order	177	Flashlight, baton, hand cuffs	Good
Disaster	357	Fiber glass boat, life vest, megaphone, floaters, radio, flashlight, rope, raincoat, boots, hard hat	Needs Improvement

Source: SEPP of the Municipality of Baco, 2018-2028

Crime Incidences

Based on the available and provided information, there have been crime incidences that occurred and were documented within the Municipality of Baco from 2015 to 2017. In 2017, crimes against persons included four cases of murder, five cases of physical injury, and seven cases of rape. In terms of crimes against property, there is only one incidence of robbery and theft that has been filed. In 2016, the crimes against persons that were recorded included murder, homicide, and five cases of both physical injury and rape. The detailed incidences of crime as well as cases that have been solved from 2015 to 2017 are summarized in **Table 2-36**.

Table 2-36: Crime Incidence for the Past Three Years, 2015-2017

Type of Crime	2015		2016		2017	
	Total	Cases Solved	Total	Cases Solved	Total	Cases Solved
Index Crimes						
Crimes Against Person		13		15		13
Murder	1		1		4	
Homicide	0		1		0	
Physical Injury	1		5		5	
Rape	5		5		7	
Crimes Against Property						
Robbery	7		0		1	
Theft	2		4		1	
Non-Index Crimes	46	15	51	42	56	32

Source: SEPP of the Municipality of Baco, 2018-2028

2.5.2.9 Local Economy

The economic backbone of the Municipality lies in its primary sector. Baco's primary agricultural products include rice, banana, coconut, citrus, lanzones, and rambutan. Mango, cacao, coffee, and durian trees were also planted in the area. Local farmers also grow root, leafy, and leguminous vegetables. Corn, abaca, tambo, and cassava producers are also cultivated. Fishermen rely on the abundance of municipal waters, freshwater, and brackish water fishponds for a living. Livestock is raised in the 27 barangays to meet the increasing demand for meat. Aside from hogs, goats, carabaos, cattle, and a few horses are raised for livestock.

Poblacion is the only barangay having an established commercial area and a public market boosting the commerce and trade subsector. Several dry goods, general merchandise, supermarket, and other sorts of retail establishments surround the public market. The national highway is also bordered with business establishments such as as gas stations, motels and restaurants, apparel stores, and others.

Baco's industry is mostly centered on the production of agricultural and forest products. There are a number of rice mills, boat builders, and wood products and sash industries across different barangays. In terms of its tourism industry, Baco's natural scenery and geography attract local, national, and international visitors. Baco's physical features are further enhanced by culture and traditions; Baco is the oldest town in the province of Oriental Mindoro.

Table 2-37 shows that the major source of income of formal economy in the Municipality of Baco.

Table 2-37: Employment by Type of Economic Activity, 2016-2017

Economic Activity	2016		2017	
	No.	%	No.	%
Primary				
Agriculture, Hunting & Forestry	6	86	2	100
Fishing	1	14	0	0
Mining & Quarrying	0	0	0	0
Primary Sub-total	**7**		**2**	
Secondary				
Manufacturing	50	96	40	91
Electricity, Gas and Water Supply	0	0	0	0
Construction	2	4	4	9
Secondary Sub-total	**52**		**44**	
Tertiary				
Wholesale and retail trade/ repair of motor vehicles motorcycles	398	78	369	80
Hotels/Restaurants	29	6	38	8
Transport, Storage & Communication	16	3	11	2
Financial Intermediation	43	8	23	5
Real Estate, Renting & Business Activities	8	2	10	2
Public Administration and Defense /Compulsory Social Security	0	0	0	0
Education	0	0	1	0.20
Health and Social Work	1	0.20	0	0
Other Community, Social and Personal Service Activities	13	3	9	2
Tertiary Sub-total	**508**		**461**	

Source: SEPP of the Municipality of Baco, 2018-2028

2.5.3 Socioeconomic and Perception Survey

A socio-economic and perception survey was performed on the thirteen direct impact barangays to determine the knowledge and sentiments of these communities towards the project. The perception survey was held from the first to third weeks of June 2023, along with the information and education campaign (IEC) activities. Locals were tapped as enumerators, taking advantage of their superior knowledge of their own communities and neighborhoods. These enumerators were informed about the project description and trained on answering the designed survey instrument.

A total of 349 respondents were interviewed on a face-to-face and one-to-one basis to gather basic information about their households and their views on the proposed project (Table 2-38). Samples were taken from each purok or sitio of each host barangay to ensure that the survey would be as comprehensive as possible in terms of its reach. Sampling was done only during daylight hours and in light of safety and security considerations. The sample size was determined with a margin of error of ± 5 and a confidence level of 95%. Respondents were chosen in the following order of preference:

- Household head (who may be male or female but is always a resident household member who makes the major household decisions or is perceived to do so; the household head is usually the father but may also be the mother or the eldest child who is of majority age (18 years old);
- Spouse of the household head;
- Son or daughter who is at least 18 years old of the household head; or
- Other relative who is at least 18 years old of the household head.

Table 2-38: Number of Respondents per Barangay

Barangay	Sample
Alag	30
Burbuli	14
Catwiran I	30
Catwiran II	33
Lumang Bayan	14
Malapad	10
Poblacion	62
Pulang Tubig	20
Putican Cabulo	11
San Andres	8
Sta. Rosa I	46
Tabon Tabon	36
Water	35
Total	**349**

In general, the survey aimed to develop appreciation for the communities' perceived ideas on the project and to serve as an avenue for the host communities to provide initial suggestions and recommendations to the project proponent.

Respondents' Profile

There were generally more females (64%) than males (34%) who were interviewed for the survey (Figure 2-30). Among the thirteen barangays, only Malapad, Pulang Tubig, and San Andres posted a slightly higher number of male respondents than females.

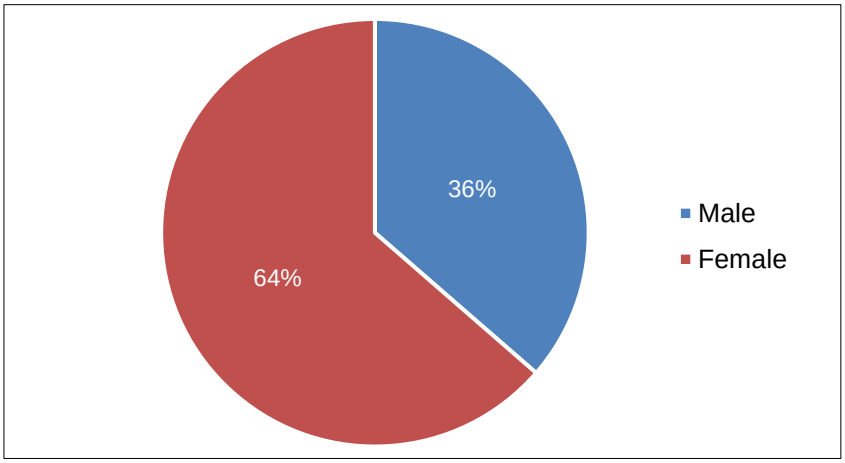


Figure 2-30: Gender of the Respondents

In terms of age, most respondents are within the range of 40-44 (13%) and 45-49 (11%). The least significant number of respondents was recorded both within the youngest and eldest age groups at 0.3% and 3%, respectively (Table 2-39).

Table 2-39: Age of the Respondents

Age	Frequency	Responses
15-19	1	0.3%
20-24	15	4%
25-29	20	6%
30-34	33	9%
35-39	31	9%
40-44	44	13%
45-49	37	11%
50-54	36	10%
55-59	34	10%
60-64	33	9%
65-69	26	7%
70-74	16	5%
>75	11	3%
No Response	12	3%
Grand Total	**349**	**100%**

The majority of the interviewed individuals in all barangays were married (69%), widow/er (7.47%), and single (9%). Many respondents have an average household size of four and five members, both at 21%.

Roman Catholicism (RC) is the predominant religion in all four impact barangays at 87%. This is followed by Iglesia ni Cristo (5%), and Born Again Christian (3%).

Many respondents were able to reach and graduate elementary level at 38%. Only 1% of the respondents have graduated in college while only 2% have received no formal schooling (**Table 2-40**).

Table 2-40: Highest Educational Attainment of the Respondents

Educational Attainment	Frequency	Responses

None	6	2%
Elementary Level	134	38%
High School Level	132	38%
Vocational	18	5%
College Level	50	14%
Graduate	4	1%
No response	5	1%
Grand Total	**349**	**100%**

The majority of the respondents have resided in their respective barangays for more than 40 years (83%). The length of residency of the respondents is reflective of their birth, employment opportunities, and marriage.

Household and Housing Characteristics

Many respondents are dependent on income from selling goods and/or peddling (20%). There are also significant number of respondents who rely on contractual jobs (13%), fishing (13%), and farming (12%) (**Table 2-41**).

Table 2-41: Primary Sources of Income of Households

Primary Sources of Income	Frequency	Responses
None	85	20%
Regular Private/Government Employee	34	8%
Contractual Job/Sub-contractor	56	13%
Selling Goods/Peddling	84	20%
Fishing	50	12%
Farming	55	13%
Family Business	15	4%
Remittances from OFW Family/OFW Relatives	10	2%
Junk Collector	4	1%
PUV Driver	10	2%
Locksmith	2	0.5%
Pension	2	0.5%
Sidelines	1	0.2%
No response	9	2%
Grand Total (Multiple Response)	**417**	**100%**

More than half of the respondents confirmed that male household heads are the breadwinners of the family (55%), followed by female heads (18%) and male children (12%).

Many respondents declared an estimated monthly income of PHP 1000–4999 (48%) and PHP 5000–999 (29%). On the other hand, the same ranges of monthly expenses were reported in the survey.

Many respondents are freely occupying the lots where their houses are built (41%). Those who have legal ownership of their home lots are recorded at 39%.

In terms of housing materials, more than half of the respondents' houses are made up of combined wood and concrete (53%). Nineteen percent of the respondents have houses made of pure concrete, while 14% have dwellings made of salvaged materials (**Figure 2-31**).

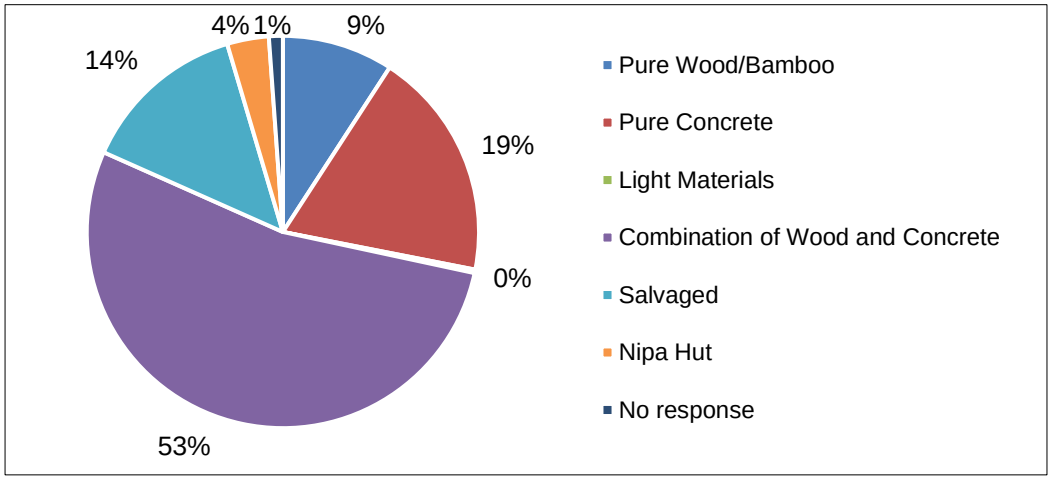


Figure 2-31: Housing Materials

The majority of the respondents have access to electricity provided by ORMECO (93%).

Many respondents sourced their drinking water from deep wells and piped connections, at 47 and 46%, respectively. On the other hand, water requirements for daily use also come mainly from the mentioned sources.

More than half of the respondents are using fuelwood (56%) and LPG (39%) for cooking.

Health and Sanitation

When asked about the common leading causes of morbidity and mortality in the households, the following diseases were enumerated by the respondents (**Table 2-42**).

Table 2-42: Leading Causes of Morbidity and Mortality

Leading Causes of Morbidity	Leading Causes of Mortality
Fever	
Cough	Cancer
Colds	Heart Attack
Hypertension	Stroke
Headache	Diabetes
Arthritis	Asthma
Asthma	

Nearly half of the respondents avail themselves of the healthcare services provided by the RHU (47%). There are also respondents who resort to going to the provincial hospital (16%) and their barangay health stations or centers (12%) for their medical concerns. In addition, many respondents purchase their medicines in the surrounding private pharmacies (69%).

Many of the respondents have houses equipped with sanitary toilet facilities (65%).

In terms of solid waste management, nearly half of the respondents compost (49%) and many are still practicing garbage burning (38%).

Perceptions on the Project

The majority of the respondents are aware of the proposed project (73%) while some 26% are still uninformed about it (**Figure 2-32).** Almost half, or 48%, of the respondents revealed that the information and knowledge regarding the project were learned from their barangay officials.

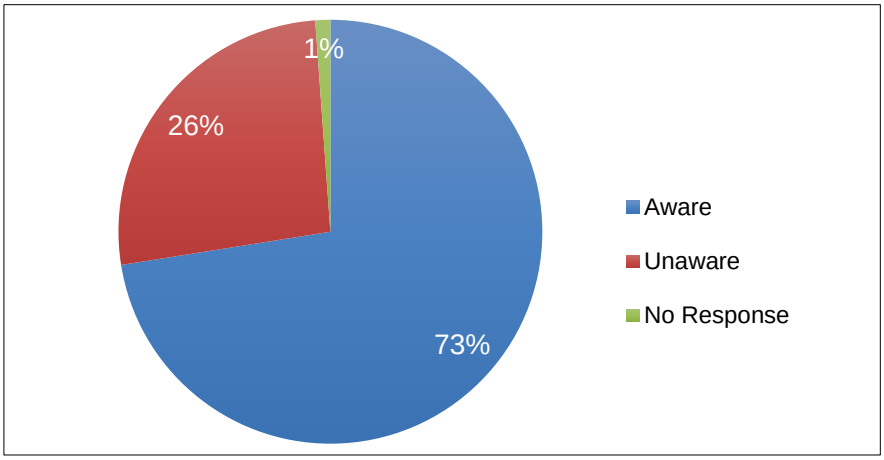


Figure 2-32: Project Awareness

Many respondents identified flood control and prevention (64%), improvements to roads and other infrastructure (20%), and employment opportunities (5%) as the leading anticipated project benefits. On the other hand, concerns about health and security (20%), environmental degradation (17%), and the loss of livelihoods of fishermen (16%) were identified as potential adverse impacts of the project.

Common household and community problems raised by the respondents are mostly focused on their socioeconomic condition and environmental concerns (**Table 2-43**).

Table 2-43: Common Household and Community Problems

Household Problems	Community Problems
• Financial problems • Housing materials • Insufficient food • Unemployment • Illnesses • Insufficient income • Increasing price of commodities •	• Flooding • Lack of livelihood and job opportunities • Natural disasters • Damaged infrastructures • Farming problems • Improper waste disposal • Ineffective governance • Political issues • Water interruptions • Lack of streetlights

Respondents were also asked to rate the quality of their lives based on the provided scale from 1 to 10, with 1 for an ideal and promising living condition and 10 for an undesirable living state. The survey revealed that there were more respondents who answered on the negative side of the scale (6–10) at 47% than those who marked from 1-4 at 36.3%. In addition, 25% of the respondents are on the neutral side (**Table 2-44**).

Table 2-44: Ratings About Respondent's Quality of Life

Rating	Frequency	%
1	3	0.9%
2	5	1.4%
3	10	3%
4	20	6%
5	86	25%
6	14	4%

7	23	7%
8	58	17%
9	14	4%
10	54	15%
No Response	62	18%
Grand Total	**349**	**100%**

Provided ratings on the quality of life are based on the following sentiments of the respondents:

- Insufficient household income
- Increasing prices of commodities
- Lack of livelihood and employment opportunities
- Farming problems
- Average living standard

The overall project impression was given to each respondent by rating their general perception of it. According to the survey results, many respondents believed that the project was very beneficial (60%) and beneficial (21%), respectively, to the impact barangays (**Table 2-45**). The affirmative ratings provided by the respondents are deeply anchored on the thought that the project is an effective measure to mitigate flooding problems and a magnet for employment opportunities for the locals. A neutral grade of 5 (7%) was also given due to the respondents' mixed sentiments on the project's benefits and adverse impacts. The said impression may also be attributed to the respondents' lack of knowledge and deeper understanding of the project. Thus, continuous IEC and public consultation activities should be done to fully further the stakeholders' understanding and appreciation of the project.

Table 2-45: Overall Ratings About the Impact of the Project to the Community

Rating	Frequency	%
Poorly beneficial	10	3%
Not beneficial	2	1%
Moderately beneficial	25	7%
Beneficial	75	21%
Very beneficial	210	60%
No response	27	8%
Grand Total	**349**	**100%**

In order to successfully implement the project, the following comments and recommendations were provided by the respondents to the proponent:

- The project should ensure and implement environmental and social safeguards;
- Employment opportunities should be made available for the locals;
- The project should serve its main purpose of mitigating flooding;
- The proponent should ensure compliance with all regulatory bodies;
- The proponent should conduct continuous consultations with the affected communities; and
- The proponent should ensure timely implementation of the project.

2.5.4 Impact Assessment

2.5.4.1 In-migration/ Proliferation of informal settlers

A temporary influx of workers can be expected during the operation phase of the Project, which may lead to the proliferation of informal settlers in the impact barangays. To ensure maximum benefit for the host community, it is recommended to the Proponent or its contractors to prioritize qualified local residents as their workers (of any type) during project implementation. The proponent will encourage migrant workers to participate in social activities and social development programs to interact with the community. On the other hand, coordination with the barangays and LGU will be undertaken to monitor and prevent the encroachment of informal settlers within the vicinity.

2.5.4.2 Displacement of settlers

There are no existing settlements on the river where the dredging activity will take place. Thus, the project has no involuntary resettlement impacts.

2.5.4.3 Threat to delivery of basic services/ resource competition

Community operations will not be significantly affected during the whole project implementation. Service utilities will not be disrupted once the project is in operation. The power, water and other utilities requirements of the project will be integrated into implementation plan and would not deprive the public to access to such utilities. In addition, the project will even augment the services and resources of the host communities because of the revenue and development programs that it will bring to the barangays and municipality.

2.5.4.4 Threat to public health and safety

Given the temporary influx of workers during the operation phase, daily interactions between non-locals and locals are expected to occur. The presence of such non-local workers in this Project is unlikely to cause the prevalence of new diseases on the local community or social problems. However, as the interaction with non-local workers will not be limited, mitigation measures should be adopted to manage social ills, conflict and the spread of communicable diseases.

Aside from noise, potential air and water pollutants that will be generated during project implementation may bring adverse impacts on the health and safety of the workers and residents of nearby communities. To respond to these, preparation and implementation of an Environmental Management Plan and Social Development and Management Plan will be done by the proponent. In addition, workers may be exposed to ergonomic stress and increased levels of noise and heat, as well as physical hazards associated with moving heavy equipment and vessels. An Occupational Health and Safety Management Plan will be implemented by the proponent during the operations stage.

2.5.4.5 Generation of local benefits from the project

Direct benefits would include employment opportunities for local skilled and unskilled workers during the operation phase. Hiring information including minimum employment requirements for local hires will be provided to the LGU and the local barangay officials to ensure that local workers are given the chance to be employed by the Project. Although there are employment opportunities which may be brought by implementing the project, residents whose livelihoods are dependent on the water bodies may be greatly affected during and after the project's operation. Thus, a community-driven social development and management plan must be prepared to incorporate their needs and recommendations.

In general, improvement in demand for local services and commerce is expected during project operations. When the mobility and demands for goods and services boomed as a spill-over impact of the project, taxes, incentives, and fees from the project during its operation phase will absolutely increase the revenue generated by the LGU. This impact is a natural consequence of the project's development. Thus, no enhancement measure is recommended.

2.5.4.6 Cultural/Lifestyle Change

Nuisance and alteration in the routine of the residents and circulating population in the project's area of influence are expected during the operation phase. As a response, the following measures must be implemented:

- Implement and continuously monitor the effectiveness of the measures for managing the impacts of increased levels of noise and vibration, changes in air and water quality, ensuring the minimization of potential discomfort to the neighbors of the site during the operation phase;
- Implement actions to proactively communicate changes and annoyances to the neighbors of the site during the operation phase through the social management and development plan; and
- Monitor the stakeholders' grievances related to the project's operation, through a grievance redress mechanism, and implement specific measures to manage impacts to reduce the number of manifestations.

On the other hand, implementation of the project will improve the standard of living of some residents in the host locations brought about by additional jobs and higher household incomes. As a result, the affected families will be capable of giving their children proper education and widen their opportunities. The only possible negative impact of having increased financial resources is to be lured to vices like gambling, drinking or even illegal drugs, which will may lead to more serious problems.

2.5.4.7 Traffic congestion

Traffic congestion is not a significant concern since the project will not utilize inland road networks. All equipment that will be used will be brought via dredger vessels. Transportation of dredged materials will also be done via sea travel. However, transport of provisions such as food and other operational needs will follow a regular road network and other existing access points. A traffic protocol coordinated with concerned barangays and LGU will be established and will be adopted as part of operational procedures.

2.5.5 Summary of Potential Impacts/ Options for Prevention or Mitigation or Enhancement for People

Potential Impact	Phases			Prevention, Mitigation and Enhancement Measures
	Preconstruction	Development and Operation	Abandonment	
In-migration		√		Prioritize hiring of qualified local residents.
Proliferation of informal settlers		√		Coordination with the barangays and LGU to monitor and prevent the encroachment of informal settlers within the vicinity.
Threat to delivery of basic services/ resource competition		√		The project will even augment the services and resources of the host communities because of the

Potential Impact	Phases			Prevention, Mitigation and Enhancement Measures
	Preconstruction	Development and Operation	Abandonment	
				revenue and development programs that it will bring to the barangays and municipality
Threat to public health and safety		√	√	Utilization of appropriate technologies and engineering measures during project implementation; Preparation and implementation of the Environmental Management Plan, Social Development and Management Plan, and Occupational Health and Safety Plan.
Generation of local benefits from the project (Enhancement of employment and livelihood opportunities, Increased business opportunities and associated economic activities, and Increased revenue for LGUs	√	√	√	Community-driven social development and management plan for residents whose livelihoods are dependent on the water bodies.
Cultural/Lifestyle Change		√	√	Implement and continuously monitor the effectiveness of the measures for managing the impacts of increased levels of noise and vibration, changes in air and water quality, ensuring the minimization of potential discomfort to the neighbours of the site during the operation phase; Implement actions to proactively communicate changes and annoyances to the neighbours of the site during the operation phase through the social management and development plan; and Monitor the stakeholders' grievances related to the project's operation, through a grievance redress mechanism, and implement specific measures to manage impacts to reduce the number of manifestations.
Traffic congestion		√	√	Establishment of traffic protocol coordinated with concerned barangays and LGU for the transport of provisions such as food and other operational needs.

3 CARRYING CAPACITY ASSESSMENT

3.1 Environmental Management Goal and Indicator Limits

3.1.1 Land

This module presents the site assessment for the disposal of unacceptable materials or spoils from dredging activities. However, the proposed project will not dispose any material that it will dredge from the river and river mouth. All dredged materials will be taken and disposed to the identified disposal site.

3.1.2 Marine and Freshwater

The main impact of dredging activities is increase in turbidity of surface water. The maximum allowable limits of DENR guidelines for TSS are 80 mg/L for Class C water body. The ambient TSS of the rivers already exceeds the guidelines which is evident by the heavily silted condition of the rivers.

Turbidity plume generation that may cause degradation of water quality can be prevented or mitigated by the following:

- Installation of green valves, recycling (part of) overflow water, using overflow with a bottom exit, or reducing the overflow.
- Use silt curtains to reduce spread of suspended sediment from dredging operations or protect a habitat
- Filter the overflow effluent from transport barges to reduce sediment loss, suspended sediment and turbidity
- Restrict the dredging operations to certain tidal conditions (flood/ebb, spring/neap) or avoid operations during tidal extremes
- Operation to be scheduled during dry season if possible to reduce turbidity migration to coastal waters;
- Coordinate with other operators regarding minimizing dredging operation if increased turbidity is observed in the coastal areas;

3.1.3 People

With regards to People, the main impact of the proposed project is hindrance to access of the community to the river. Although the river is not the main route the communities used for daily travelling, it is used to acces the coastal waters. Small boats were seen docked along the shores of the river.

The observance of buffer zone can mitigate the restriction of acces to the river and the coastal waters. The proponent will limit the dredging activities within the River Dredging Zone. The approved buffer zone is 20 meters from the both side of the river banks.

3.2 Carrying Capacity Analysis

The carrying capacity of an environment is the maximum population size of a biological species that can be sustained by that specific environment, given the food, habitat, water, and other resources available. The carrying capacity is defined as the environment's maximal load, which in population ecology corresponds to the population equilibrium, when the number of deaths in a population equals the number of births (as well as immigration and emigration).

Ecological carrying capacity is the maximum use that the biota or the physical processes of an area can withstand before becoming unacceptably or irreversibly damaged. As any use of an ecosystem

induces change, the decision as to what level of use will cause unacceptable change is to a large extent subjective (McLachlan, 2018).

Social carrying capacity is the maximum level of use such as recreational in an area that may decline its quality. This is applicable for tourism spot such as beaches, parks and resorts where overcrowding can decline its quality (McLachlan, 2018).

The important limiting factor or indicator limit is suspended sediments which is based on the concept that the combined effects of all major controlling factors, including suspended sediments, are integrated into the existing ecological community.

The Revised Universal Soil Loss Equation (RUSLE) was used to determine the carrying capacity of the project area. RUSLE integrates different parameters of the study area such as slope, average annual rainfall, soil erodibility, landuse and conservation practices to estimate the average annual soil loss per unit area. RUSLE is a widely used mathematical model that describes soil erosion processes. It was developed in the 1930s by the U.S. Department of Agriculture Soil Conservation Service (now the USDA Natural Resources Conservation Service).

The RUSLE can be expressed as

$$A = R * K * L * S * C * P$$

Where A = average annual soil loss per unit area, R = rainfall-runoff erosivity factor, K = soil erodibility factor, L = slope length factor, S = sope steepness factor, C = cover and management factor and P = support and conservation practices factor.

3.2.1.1 Results

Rainfall-runoff erosivity factor (R)

R is the rainfall and runoff factor by geographic location. The rainfall data used is the average monthly rainfall taken from PAGASA station in Baguio City. The R factor formula is:

$$R = 38.5 + 0.5P$$

Where

R = R-factor in RUSLE equation

P = Average precipitation (During wet season)

The average total rainfall was taken from Calapan Station Climatological Normals of PAGASA Climate and Agrmet Data Section. The annual rainfall amount was computed for a uniform and relative long period comprising at least three consecutive 10-year period. The average annual rainfall computed is 2,408.3 mm.

K Factor

K is the soil erodibility factor. It is the average soil loss for a particular soil texture. It is a measure of susceptibility of soil particles to detachment and transport by rainfall and runoff. The K factor for different types of soil texture is presented below. The study area is mostly covered by clay (Figure 3-1).

Soil texture	K factor (David, 1988)
Loamy fine sand	0.07
Clay	0.13–0.26
Clay loam	0.22–0.30
Loam	0.19–0.63
Sandy clay	0.09–0.20
Sandy loam	0.23–0.30
Silt loam	0.30–0.60
Silty clay	0.19–0.27
Silty clay loam	0.28–0.35

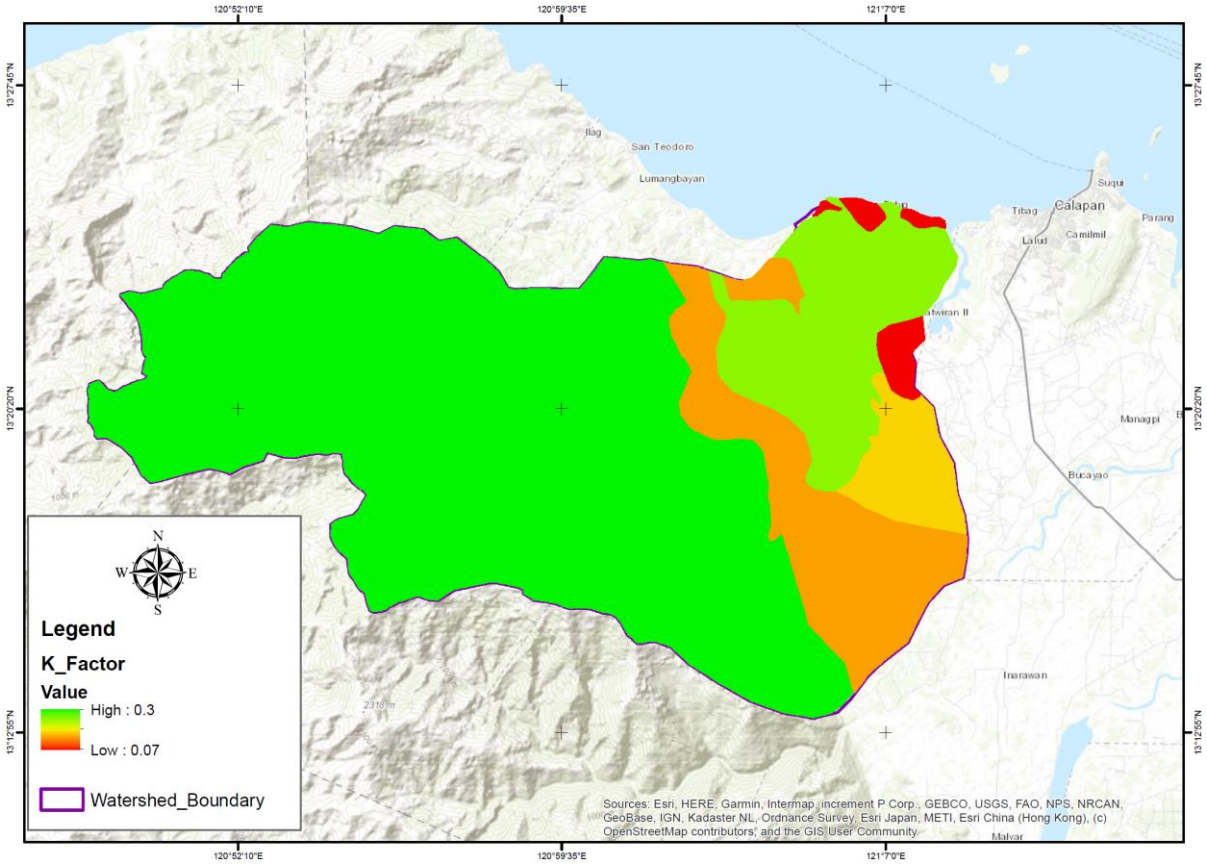


Figure 3-1: K Factor

Slope length and steepness factor (LS) derivation

LS is the slope length-gradient factor. The LS factor represents a ratio of soil loss under given conditions.

$$LS = \left[FA \times \left(\frac{cell\ size}{23.13}\right)\right]^{0.4} \times \left[\frac{Sin(Slope\ Dem\ \times 0.01745)}{0.09}\right]^{1.3} \times 1.6$$

Where

LS = Slope length and steepness factor

FA = Flow accumulation

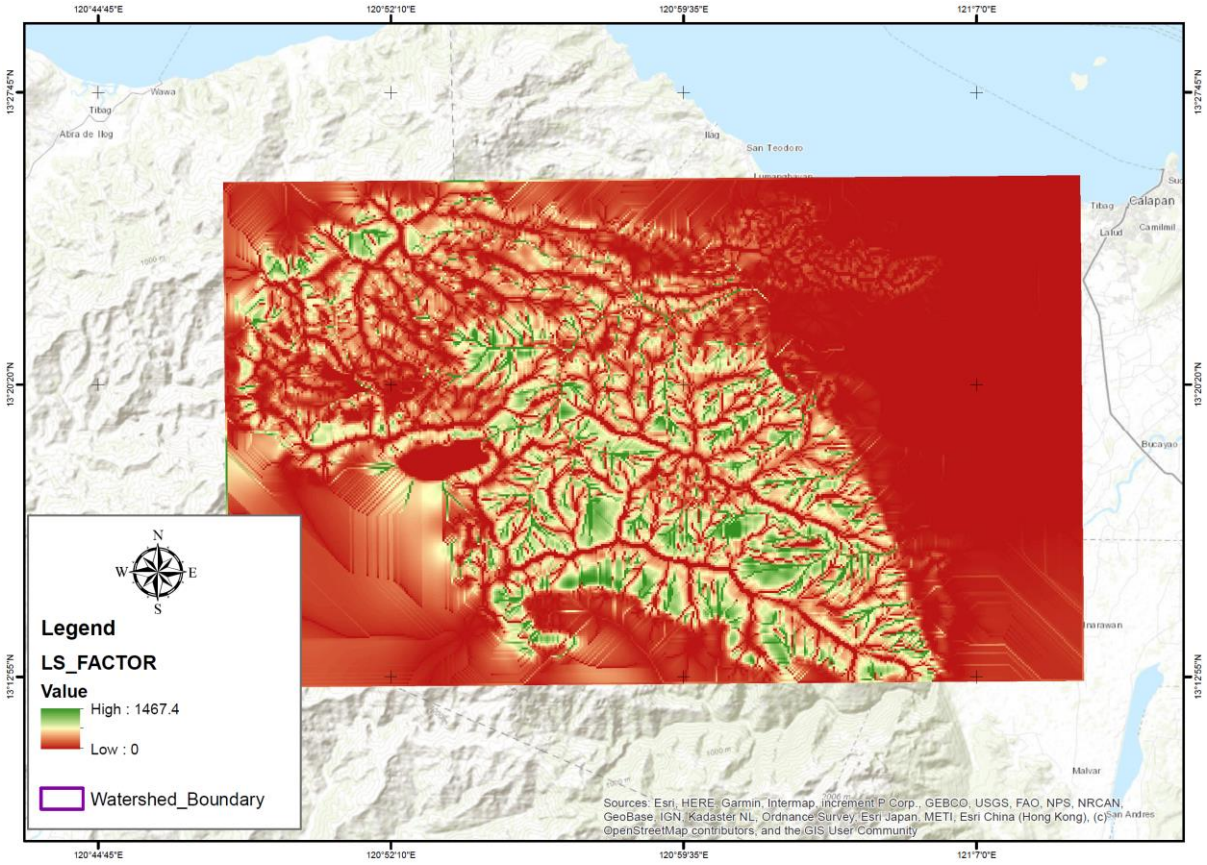


Figure 3-2: LS Factor

C Factor

C is the crop/vegetation and management factor. It is used to determinethe relative effectiveness of soil and crop management systems in terms ofpreventing soil loss. The C factor is a ratio comparing the soil loss from landunder a forest to the corresponding lossfrom continuously grazed and tilled land.The study area is mostly covered with secondary forest and shrub lands (Figure 3-3).

Land use class	Average C Factor
1. Primarily forest (canopy cover >	0.002
2. Secondary forest (canopy cover	0.006
3. Shrub	0.014
4. Agricultural land	0.377
5. Grazing land	0.11

*Adapted from Wischmeier and Smith

**Calculation from Morgan(1986)

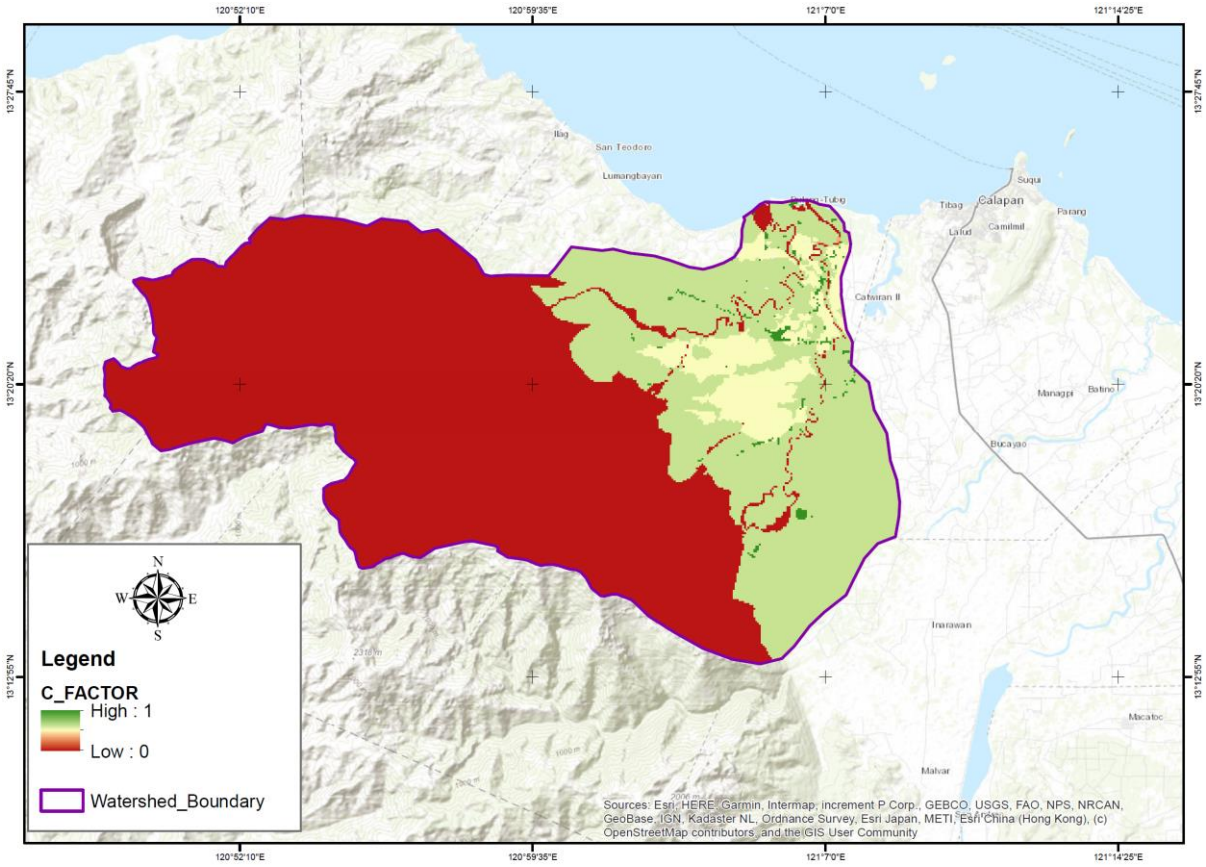


Figure 3-3: C Factor

P Factor

P is the support practice factor. It reflects the effects of practices that willreduce the amount and rate of the water runoff and thus reduce theamount of erosion.

$$P = 0.2 + 0.03S$$

Where

S = Slope grade (%)

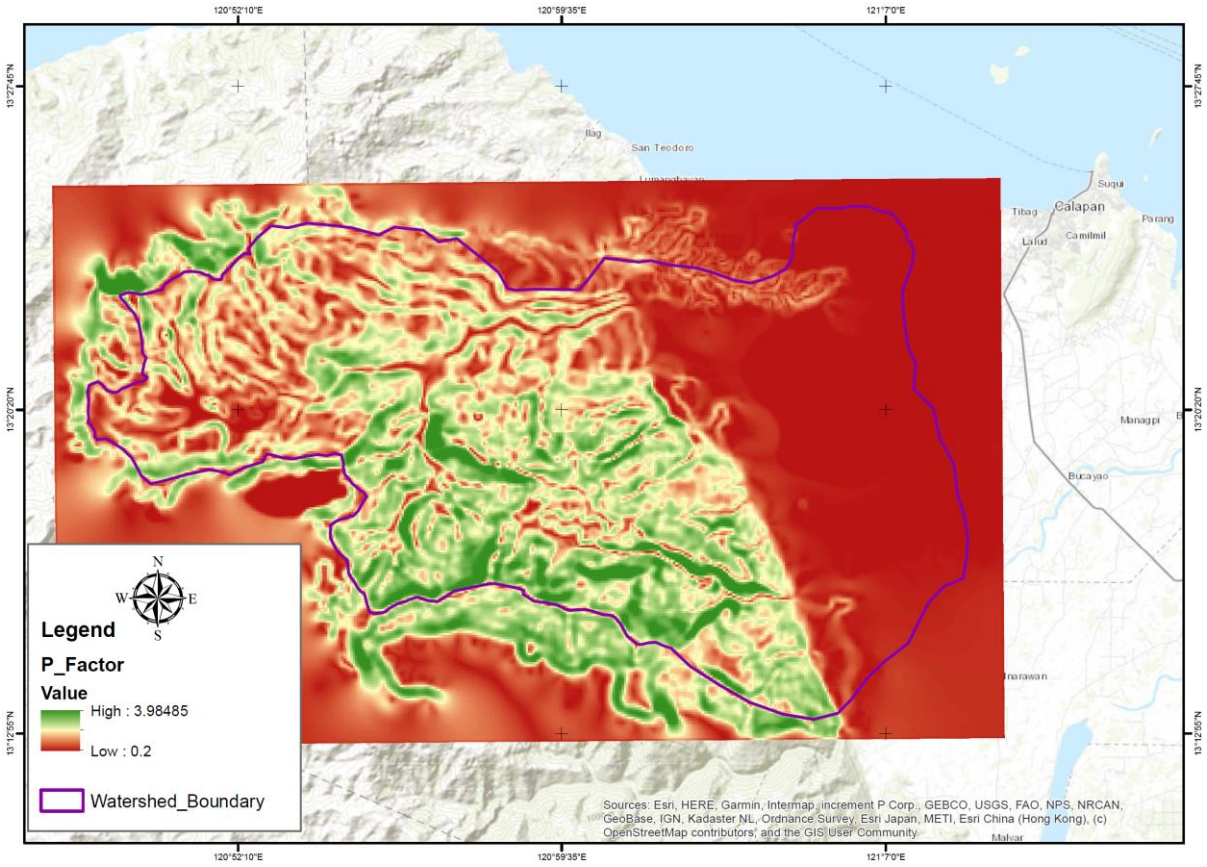


Figure 3-4: P Factor

3.2.1.1.1 Discussion

The Revised Universal Soil Loss Equation (RUSLE) was used to estimate the amount of soil loss per hectare per year in the watershed of the Alag River and Longos River.

The estimated average annual soil loss is presented in **Figure 3-5**. The estimated value of soil loss in the mountainous area ranges from 10 to 10,000 tons/ha/yr. While the low-lying areas have estimated soil loss of less than 1 to 100 tons/ha/yr.

Based on the Dredging Master Plan the maximum sediments to be dredged is 40,000 cubic meter per day or 64,000 tons per day and equivalent to 19.2 million tons per year. Applying the soil loss estimated value, the soil loss for the watershed is estimated at 177 million tons per year.

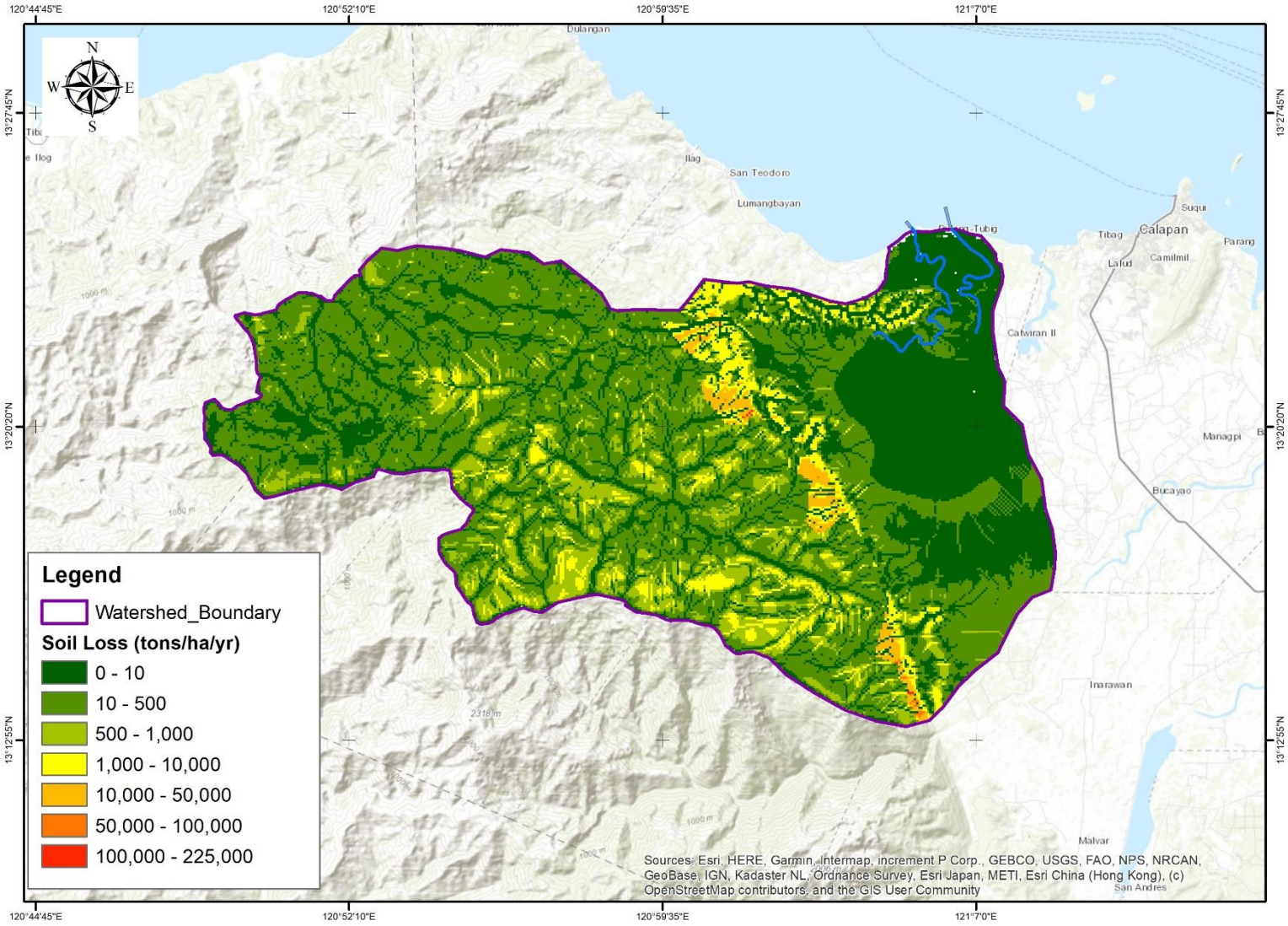


Figure 3-5: Soil Loss

4 ENVIRONMENTAL MANAGEMENT PLAN

4.1 Environmental Plan Framework and Strategic Components

4.1.1 Pre-Operation Phase

In the pre-operation phase, activities include acquisition of necessary permits, and other preparatory activities such as mobilization of equipment and personnel that do not have significant environmental impact.

4.1.2 Operation Phase

The operation phase includes the dredging operation which will start at the waterways before entering the river channel. This activity will affect the marine and river ecology in the project area. The extraction of river sediments will resuspend the sediments and thus increase the turbidity of the surface water. The increase in turbidity is temporary and can be mitigated by employing silt curtains as an example. Another mitigating measure is the application of Green Valve (or Environmental Valve) to reduce air entrainment and concentrate overflow. The Green Valve directs the overflow material to be transported vertically down and makes it settle more rapidly due to density effects.

The proposed project will not change or disrupt the tidal circulation pattern in the project area. It is expected that the circulation pattern will remain the same during and after project implementation.

4.1.3 Abandonment Phase / Rehabilitation

The abandonment phase pertains to the decommissioning of the entire Project. During the abandonment phase, BNRC shall ensure that all dredging equipment are demobilized, and that potential environmental concerns are properly and adequately addressed. BNRC shall submit a Decommissioning/Abandoment Plan, secure a Certificate of Abandonment for the Project and secure a relief from ECC from the DENR EMB.

4.2 Impact Management in the Design of Dredging Activity

The impacts brought about by the Project are classified in to three phases namely the pre-operation phase, operation phase and abandonment phase (Table 4-1).

Table 4-1: Impacts Management Plan

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Type of Impact	Options for Prevention for Mitigation or Enhancement	Responsible Entity	Cost (PHP)	Guarantee / Financial Arrangement
I. PRE-OPERATION PHASE							
Mobilization of Dredging Equipment	People	Navigational Traffic	• Reversible	• Acquisition of permits • Conduct Social Preparations • Posting of notices	BNRC LGUs	• Part of construction cost	Included in the project development and implementation
II. OPERATION PHASE							
Dredging	Water Quality	• Turbidity plume generation (suspended sediments) that may cause degradation of water quality	• Reversible	• Installation of green valves, recycling (part of) overflow water, using overflow with a bottom exit, or reducing the overflow.	BNRC	• Part of operation cost	Included in the project development and implementation
		• Presence of oil and grease from machineries that may cause degradation of water quality	• Reversible	• Quarterly water quality monitoring • Conduct proper inspection and prompt maintenance of machines and equipment, and facilities	BNRC	• Part of operation cost	
		• Erosion of river banks	• Irreversible	• Implement the approved Design Plan which may include river bank protection • Observe limits of buffer zones	BNRC	• Part of operation cost	

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Type of Impact	Options for Prevention for Mitigation or Enhancement	Responsible Entity	Cost (PHP)	Guarantee / Financial Arrangement
		• Water pollution due to improper disposal of solid waste from dredging vessels	• Reversible	• Implement proper collection, segregation and disposal of solid waste;	BNRC	• Part of operation cost	
	Marine Ecology	• Turbidity plume generation (suspended sediments) • Threat to abundance, frequency and distribution of species	• Reversible	• Operation to be scheduled during dry season if possible to reduce turbidity migration to coastal waters; • Coordinate with other operators regarding minimizing dredging operation if increased turbidity is observed in the coastal areas;	BNRC IAC LGUs	• Part of operation cost	IAC Arrangements

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Type of Impact	Options for Prevention for Mitigation or Enhancement	Responsible Entity	Cost (PHP)	Guarantee / Financial Arrangement
	River Ecology	• General habitat damage/loss in the dredge area and hydraulic entrainment • Disturbance of navigation routes	• Reversible	• Aside from following strictly the general good practices in dredging, here are some specific to the area: • Dredging time and location be scheduled to allow temporary shelter/refuge areas. • Scheduling location of dredging, one-side only at a time for example, to provide a sort of navigation route. This navigation route should be relatively free of major route barrier in the water column • On the socio-economic side, compensation for loss of fishery opportunity should be considered • Monitoring database on water quality covering standard parameters for Class C waters (	BNRC IAC LGUs	• Part of operation cost	IAC Arrangements

Project Phase / Environmental Aspect	Environmental Component Likely to be Affected	Potential Impact	Type of Impact	Options for Prevention for Mitigation or Enhancement	Responsible Entity	Cost (PHP)	Guarantee / Financial Arrangement
		• Noise generation	• Residual	• Minimize dredging activities during night time especially in areas within hearing distance from existing communities • 200m buffer zone should be observed to minimize noise level at the community near the river bank. • Use of proper Personal Protective Equipment (PPE)	BNRC	• Part of operation cost	IAC Arrangements
• Removal of fishnets and boat docking area of fisherfolks	• Fisher folks	• Disturbance of livelihood • Loss of income	• Residual	• Prepare and implement livelihood and income restoration for PAF's whose present means of livelihood is no longer viable and will have to engage in new income activity. • Conduct and implement Social Development Plan (SDP)	BNRC	• To be included in the SDP budget	Approved SDP
II. ABANDONMENT PHASE							
Demobilization	Land and Water	Adverse environmental footprint	Reversible	Follow closure and abandonment procedures/ policy	BNRC	Part of Mobilization	Part of Mobilization

4.3 Water Quality Management Program

4.3.1 Water Quality Monitoring Plan

During operation phase, water quality monitoring will be conducted monthly. Sampling station will be located upsteam and downstream of the current dredging operation. Upstream monitoring station will be used to determine the ambient condition of the river water quality. While the downstreams monitoring station will determine the impact of the dredging operation to the river water quality. The main parameters to be monitoried are TSS and Oil and Gease. Other parameters include stream flow, depth, temperature, pH and salinity.

For marine water quality monitoring, stations will be located around the dredging operation. Parameters to be monitored are TSS, Oil and Grease, pH and Temperature.

Groundwater monitoring will be conducted quarterly since the project operation has no direct impact to the groundwater. The parameter to be monitored is salinity. Fecal coliform can also be monitored as part of assistance to the local community since the groundwater is used as their drinking water source.

4.3.2 Coastal Resources Management Plan

The Province of Oriental Mindoro has an Integrated Coastal Area Management Plan (ICAMP) 2019-2023. It has implemented initiative to establish management and governance of its coastal resource. The proponent plans to coordinate with the LGU of Oriental Mindoro in implementing coastal management programs in the coastal resources of Baco.

Part of the plan is the establishment of a Marine Protected Area (MPA). MPAs provide sanctuary for fishes and other aquatic organisms, in rehabilitation of damaged ecosystems among others. The proponent will coordinate with the LGU in developing management tool to respond and mitigate the impacts to the coastal resources. Idetified tools include establishment of Marine Protected Areas (MPA) and Networks, Ecosystem Based Fisheries Management (EBFM) and establishment of Fishery Management Units (FMU), coastal zone habitat and coral rehabilitation, beach forest rehabilitation, rehabilitation of estuarine and mangrove ecosystems, watershed management for selected sites, establishment of model communities per municipality, riverbank management (10 kilometers from coast), solid waste management, risk reduction and disaster preparedness and climate change adaptation mechanisms.

The local government units were divided to form coastal management clusters, known thereafter as Clusters 1, 2, 3 and 4. The Municipality of Baco belong to Cluster 4 together with Calapan City, San Teodoro and Puerto Galera. The purpose of clustering is to conduct workshop and update the ICAMP in their respective coastal area.

4.3.3 Irrigation Water

The surface water at the coastal area is not used for irrigation because of high salinity. Irrigation water in this area uses groundwater (Figure 4-1). According to the National Irrigation Authority-Calapan City, there is a communal irrigation system (CIS) in Brgy. Lumangbayan that serves the farmlands of barangays Water and Lumangbayan. The Water Tacligan Small Irrigation Project (Figure 4-2) is a pump irrigation with source from a tributary of Alag River. According to the barangay captain of Brgy. Water, the irrigation project is not operational for years. High fuel price and cost of spare parts which are not available locally have hindered its operation.

Figure 4-1: Groundwater Source (right) and Irrigation Canal (left) in Brgy. Water

Figure 4-2: Water Tacligan Small Irrigation Project

Farmlands on inland areas use groundwater as irrigation souce. Figure 4-3 shows a pumped irrigation serving farmlands in Brgy. Malapad.

Figure 4-3: Groundwater Pumped Irrigation in Brgy. Malapad

4.4 Social Impact Management and Development Program

4.4.1 Compensation Plan Framework

Asided from the Environmental Guarantee Fund, the proponent shall allocate a Compensation Fund of PhP 200,000.00 will be readily used for compensation for stakeholders affected by the negative impacts of the project. The fund will be used as readily available fund for compensaton that needs to be settled immediately.

4.4.2 Social Development Plan

Based on the issues and concerns gathered during the focus group discussions (FGD) with the stakeholders, suggestions for social development program were identified. Some of the concerns include assistance in livelihood, education, health and safety.

The Social Development Plan (SDP) Fund maybe patterned to MGB Policy for mining project. The SDP fund is equivalent to 1.5% of direct operating cost. In this case, the SDP fund maybe equivalent to PhP4,500,000.00 based on the extraction rate of 6 million metric tons per year.

The initial identified programs are:

- Assistance in irrigation facility especially on coastal areas;
- Assistance in drinking water facility;
- Assistance in education such as (school facility, supplies, etc);
- Disaster Risk Management Programs;
- Establish docking area for small boats of fisherfolks
- Alternative Livelihood Training Programs

4.4.3 Information, Education and Communication Program (IEC)

The Information, Educational Communication (IEC) Plan Framework is an important tool in establishing harmonious relationship between the proponent and project stakeholders. It opens the line of an open interaction that will critically identify issues and concerns on the part of project stakeholders and a responsive mitigation measure to be developed by both project proponent and project stakeholders.

The proponent will undertake IEC activities in the host barangays and municipality to strengthen its harmonious relationship with the stakeholders. The indicative costs of IEC activities are presented in Table 5-2.

4.4.4 Indigenous People

There are no IPs in the project area.

4.5 Environmental Risk Management Plan for the River System

DENR has provided guidelines in identifying potential hazards associated with project implementation. The list includes storage of hazardous materials, production of hazardous materials and processes that result to hazardous scenario. None of those listed are associated with this dredging project. Therefore, the project does not belong to Level 1 nor Level 2 level of threshold inventory.

4.5.1 Hazardous Materials

Table 4-2 shows the list of hazardous substances and materials for the proposed project. The estimated quantities of hazardous substances or materials were all below the Level 1 threshold, thus the proposed project is not covered by the Environmental Risk Assessment

Plate 4-1 and **Figure 4-4** shows the threshold limit and the process of determining the risk screening requirement, respectively, based on the estimated quantities on the hazardous material.

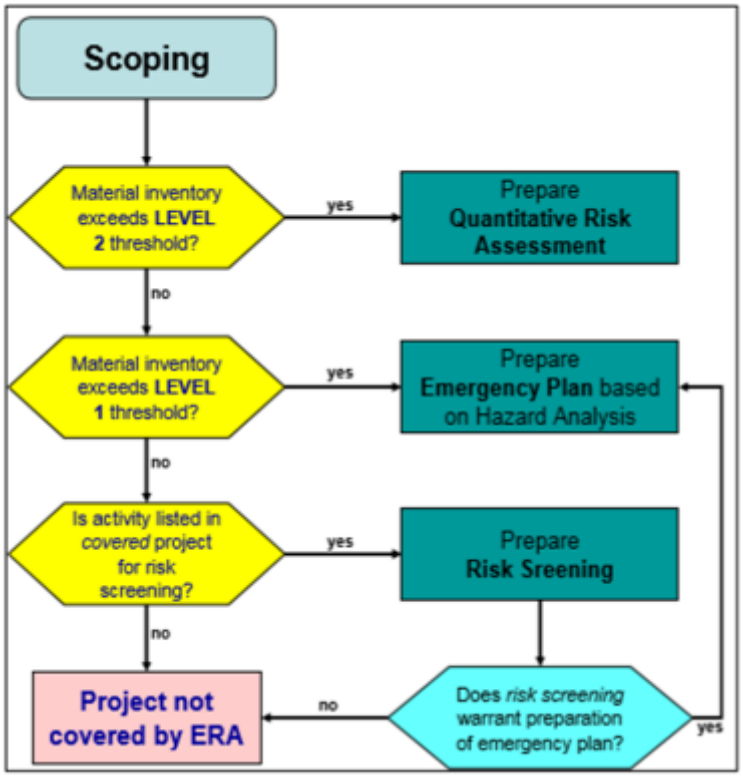
Table 4-2: Estimated Quantities of Hazardous Substances/Materials

Substances / Mixture / Materials[1]	Hazard Classification as Screened	Estimated Quantity (MT)	DENR Threshold (MT)	
			Level 1	Level 2
Diesel Fuel	Flammable	1,500	5,000	50,000
Diesel Oil		310		
Lubricating Oil		15		
Notes: MT – metric ton				

2. Levels 1 and Level 2 Threshold Inventory. The following threshold levels shall be used to determine whether a proposed project or undertaking shall be required to prepare a QRA and/or an emergency/contingency plan:

CATEGORY	LEVEL 1 (tons)	LEVEL 2 (tons)
Explosives	10	50
Flammable substances	5,000	50,000
Highly flammable substances	50	200
Extremely flammable substances	10	50
Oxidizing substances	50	200
Toxic substances (low)	50	200
Toxic substances (medium)	10	50
Toxic substances (high)	5	20
Toxic substances (very high)	0.2	1
Toxic substances (extreme)	0.001	0.1
Unclassified (Type A)	100	500
Unclassified (Type B)	50	200

Plate 4-1: Threshold inventory limit (Source: DAO 2003-30)



(Source: DAO 2003-30)

Figure 4-4: Screening (include expected threshold inventory

4.5.2 Safety Risks

Fire

- The risk of fire is nil since the Project does not concern with combustible products, manufacturing or process. During dredging operations, only the vessel's engine will be susceptible to occurrence of fire since all other components of the dredging operations will not involve any chemicals, fire-causing scenarios or electrical-related problems.
- Possible occurrence of fire at the engine room and engine parts. Though smoking and other unnecessary fire-causing activities are prohibited in all parts of the vessel, occurrence of fire, although nil, is still a possibility. Other possible occurrence of fire would be at the kitchen area of the vessel where the crew members cook their meals. Other possibility of fire occurrence is when there are faulty electrical wirings at the vessel.
- Should this low risk of fire occurrence in the engine room or fuel tank occur, possible hazard would be the possibility of oil spill to the sea of the remaining fuel of the vessel. Less hazard to the environment is foreseen during kitchen fire since this can be very easily contained and very less likely to spread to the other parts of the vessel, being made of steel and with very little combustible materials at the kitchen area.
- The vessels that will be used during dredging operation are complete with fire safety certificates, firefighting equipment and emergency response protocol. All emergency response procedures, drills and guidelines are regularly updated with the crew following existing laws on maritime safety and emergency response.

Explosion

- The risk of explosion is also nil as the Project does not require the use of explosives or the likes. The possibility of an explosion is only possible during accident at the engine room.

- Possibility of oil spill at the sea may occur immediately after large explosions causing vessels to sink

- The crews that will be deployed during dredging operations in this Project are the same crew ever since the dredging vessel has been in operation. Hence, their familiarity with the operation of the vessel is an added assurance to the less likelihood for accidents to happen. Compliance to health and safety requirements shall also be imposed, including constant updating of vessel safety and emergency response protocols following domestic and international standards.

Release of Toxic Substances

- The only toxic substance that may be released by the vessel is the possibility of oil spilling into the sea.
- This may occur during leaks in fuel tanks and sinking of the vessel.
- Possible hazard during spill is the spreading of oil to a wider area and causing harm to the surrounding mangroves and fishing grounds which are outside the Project area.
- The same adherence to domestic and international health, safety and emergency response protocols shall be observed and practiced during dredging operations.

4.5.3 Physical Risk

Flash flooding can occur downstream of the river. From key informant interview, this phenomenon was known to occur. This natural hazard may cause destruction of dredging machineries and harm to operating personnel.

Risk levels can be characterized by treating the cross product of the hazard level and the exposure level of receptors. Table 4-3 provides insights on the risk level of imposed to the environment.

Table 4-3: Matrix of Risk Levels on Receptors

Receptor	Exposure				
Water	Very high	Very High	Very high	High	
Air	Low	Medium	Medium	Low	
Personnel	Very High	Very High	Very High	High	
Land	Very Low	Medium	Medium	Low	
		High	Very High	Medium	Probability of Generation
		Flash Flooding	Oil And Grease	Accidental Fire	Hazard

The above analysis provides insights as to where the focus of mitigation is significant. Risk mitigation can be achieved by reducing or modifying the source, by managing or breaking the pathway and/or modifying the receptor. These are all incorporated in the mitigating measures that will be implemented.

Flash flooding can only be anticipated. Early warning system may be helpful in breaking the path between the receptor and the stressor i.e. working personnel and dredging equipment as receptor and flash flooding as stressor.

Regular monitoring and adherence to DPWH dredging design is mandatory during dredging operation.

4.6 River Delta and Shoreline Enhancement Plan

4.6.1 Planned Depth and Width of River Delta

The planned depth of river delta to cleared in Alag River is 10.5 m to 15 m maintaining a slope of 2.01%. For Longos River, the planned depth of river delta to cleared in Alag River is 5 m to 8.5 m maintaining a slope of 2.01%. The planned width of both rivers is 100 m which is equal to the width of the river.

4.6.2 Maximum Distance to the End of the Clearing

The maxiumum distance to the end of the clearing for Alag River and Longos River is 250 m and 1,000 m respectively.

4.6.3 Bathymetry and Marine Survey

The bathymetric survey was of the Alag River and Longos River was conducted to generate the cross-sections and profile for the navigational waterway clearing. The cross-sections and profiles are included in the Dredging Master Plan (Annex 13). The bathymetric map is shown in Figure 4-5.

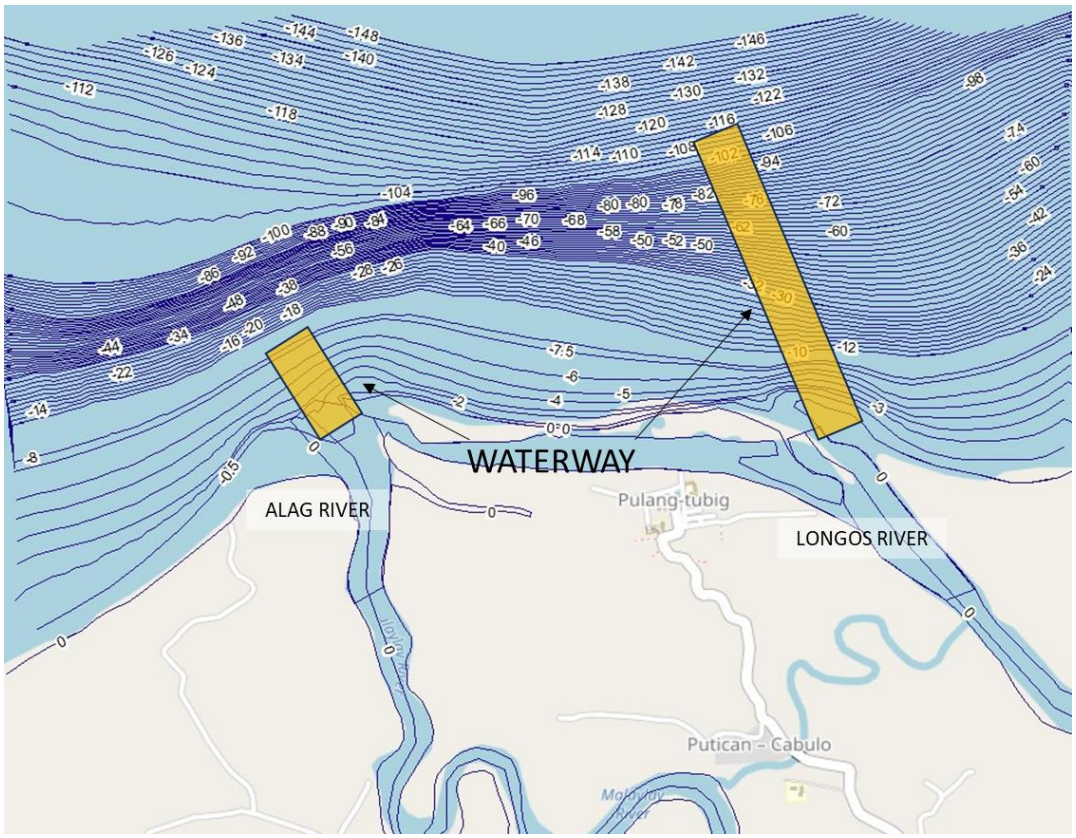


Figure 4-5: Bathymetric Map of the Project Area

The marine survey is discussed in Section 2.3.4.4 Marine Ecology.

4.6.4 Location or Proximity of the Protected Areas

The Protected Areas proximate to the project area are:

Protected Area	Legal Basis	Legal Status	Approximate Distance from Proposed Project
1. Naujan Lake National Park	Proclamation No. 335 s. 1968	Initial Component	40 km
2. Mangrove areas along banks of: a. Mamburao River, b. Buluangan River to Lagarum River, Naujan, c. Bank of Betel Creek, d. Sablayan Pt. to Bagong Sabang River, e. Labangan to Calalayuan Pt. f. Suko River, g. Casiliga River, h. Island of Soguicay	Proclamation No. 2152, s. 1968	Initial Component	a. 56 km b. 23 km c. 55 km d. 70 km e. 123 km f. 89 km g. 48 km h. 123 km
3. Mt. Iglit-Baco National Park	Proclamation No. 557, s. 1969	Legislated	67 km

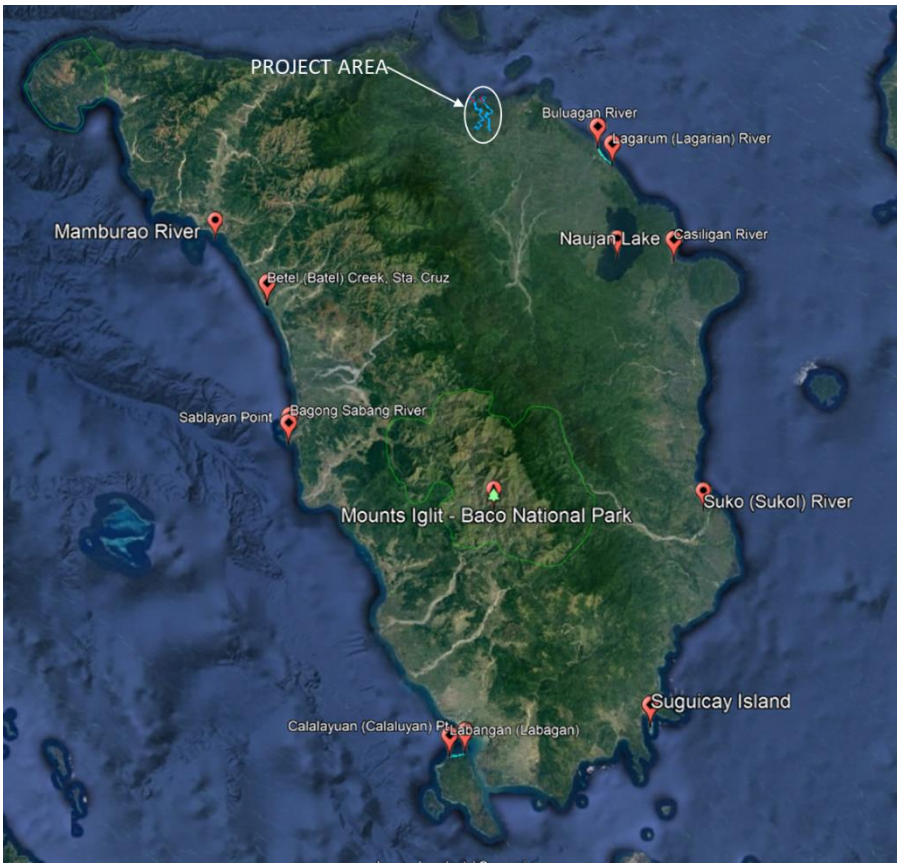


Figure 4-6: Map of Protected Areas

4.6.5 Quantity of Materials to be Removed

Based on the Dredging Master Plan, the length of the channel and waterway of the RDZ in the Alag River is 10,000 m and 250 m respectively. The total volume of dredged material is approximately 7 million cubic meters.

Table 4-4 shows the summary of length and volume of dredged material.

Table 4-4: Summary of Project Size

Alag River	Length (m)	Volume (cbm)
Waterway	250	94,304
Channel	10,000	6,645,530
	TOTAL	6,739,834

5 SOCIAL DEVELOPMENT PLAN/FRAMEWORK (SDP) AND IEC FRAMEWORK

5.1.1 Social Development Plan Framework

5.1.1.1 Background/ Rationale

The Social Development Plan Framework (SDPF) will address the issues and concerns and impacts identified during the consultations and discussions with the affected barangays. It will incorporate the proposed interventions based on needs of various stakeholders of the project.

As part of its social responsibility, the proponent will aim to provide basic social services and empower the stakeholders, especially the affected residents as partners for sustainable development.

It will also strive to develop strategies that will alleviate poverty and improve the standard of living of communities through socio-economic programs and projects that will harness affected residents' productivity to the fullest, strengthen their self-reliance values and enhance their dignity as members of civil society.

5.1.1.2 Basic Features of the SDP

The SDPF is based on the sustainable development and self-reliance approaches. Its goal is to empower communities and stakeholders to undertake sustainable development efforts even after the decommissioning of the project.

The full benefits of the project should be able to trickle down to the most disadvantaged and vulnerable sectors of affected communities. The participation of these vulnerable sectors (youth, women, elderly, persons with disability, fishermen, farmers, small traders and enterprise owners, etc.) as "partners" of development activities in the affected barangays should be ensured from planning, implementation to evaluation of identified projects.

The SDP should be able to complement the existing Municipal/Provincial Development Plans and consider their basic priorities identified by the LGUs, and more importantly, the project impact and stakeholders' concerns and issues.

Table 5-1: Indicative Social Development Plan Framework[1]

CONCERN	Responsible Community Member / Beneficiary	Government Agency/ Non-government Agency and Services (Indicative Specific Services)	Proponent	Indicative Timeline	Source of Fund
1. Gender Responsive • Livelihood/Employment and Credit Facilities <u>Men</u> • Skills development for project employment and other alternative livelihood <u>Women, Youth, and Elderly</u> • Livelihood trainings for skills development	• Barangay Kagawad for livelihood • Qualified identified workers within the area who will be affected by the project • BFARMC President and qualified identified affected fisher folks • Qualified identified affected residents in the vicinity of the project area	• LGU- Planning and Development Coordinator • MSWD - Livelihood programs for indigents - Encourage formation of associations for alternative source of livelihood • MAO - Workshop on alternative agricultural and fishing methods - Construction of fish ponds - Construction of trading post, farm to market roads, plant nursery, fishery and livestock breeding stations - Integrated Agro-complex plus piggery - Poultry startup • TESDA - Skills training - Water Refilling Station • BFAR - Workshop on alternative agricultural and fishing methods - Training for fishing and fishing related skills development including fish processing, marketing, etc	Community Relations	• Pre-operation • Operation • Decomissioning	LGU –IRA/ BNRC
2. Health and Safety • Safety for the future employees (accidents and exposures) • Safety of the project affected residents (environmental health)	• Barangay Kagawad for Health • Barangay Health Workers • Barangay Nutrition scholars	• Municipal Health Officer - Establishment of Barangay Health Stations and Nutrition Centers • Municipal Disaster Risk and Reduction Management Office and Municipal Engineering Office	Community Relations Safety Officer	• Pre-operation • Operation	LGU –IRA/ BNRC

CONCERN	Responsible Community Member / Beneficiary	Government Agency/ Non-government Agency and Services (Indicative Specific Services)	Proponent	Indicative Timeline	Source of Fund
• Defining the Safety Buffer Zone • Emergency Response Program • Dredging Safety Procedures and Protocol	• Barangays affected by the project • Project employees	- Construction of safety nets infra-structure such as perimeter fence, spur dikes, flood control structures and the likes - Establishment of buffer zones at the periphery of health facility areas; - Construction of Evacuation Centres. - Conduct various trainings, IEC, drills on disaster risk reduction management to families, schools and other sectors - Institutionalize warning system - MOU with compatible schools and owners of private bldng • Barangay Health Emergency Response Teams (BHERT) • Barangay Disaster Managmeent Council - Inventory on barangay warning devices and equipment			
3. Environment and Sanitation	• Barangay Kagawad for Environment • Barangays affected by the project	• Municipa Health Office • Municipal Environment and Natural Resources Office - Construction of sanitary landfill and enactment and enforcement of ordinances to support the efficient implementation of the system. - Strict implementation of Ordinance regulating the use of plastic - Construction of vermin culture facilities - Completion of Materials Recovery Facility for each barangays	Community Relations	• Pre-operation • Operation	LGU –IRA/ BNRC
4. Peace and order	• Barangay Kagawad for Peace and order • Barangay Tanod • Baranagy Peace Officers	• Philippine National Police • Bureau of Fire Protection • Armed Forces of the Philippines Philippine Coast Guard • Philippine Navy	Community Relations Security Office	• Pre-operation • Operation	LGU –IRA/ BNRC

CONCERN	Responsible Community Member / Beneficiary	Government Agency/ Non-government Agency and Services (Indicative Specific Services)	Proponent	Indicative Timeline	Source of Fund
	• Project Affected Community	• Criminal Investigation and Detection Group • Maritime Command • Bureau of Jail Management and Penology - Provision of response team, equipment, and facilities as aid in keeping order in the community			

[1]The SDP of the project shall be derived from, and aligned with, the LGU's existing SDP. The project's SDP normally aims to prevent/mitigate and/or enhance a project's adverse and positive impacts, respectively, on people's livelihood, health and environment. The process of formulating the project's SDP shall be actively participated in by Municipal Development and Planning Officer (MPDO) and/or other Government Agencies whose mandates cover the management of impacts posed by project operations, e.g. DOH who may coordinate with the Proponent on the conduct of health impact studies or conduct of medical missions to alleviate adverse health effects attributed to the project.

[2]The cost estimates shall be estimated once specific projects have been processed and identified thru consultation with the concerned LGUs and sectors in the potentially affected communities. The Proponent shall share in the cost of the selected projects from the LGU's SDP found to be relevant to the attainment of compliance or socially responsible EMP implementation.

5.1.2 Information, Education and Communication Framework

5.1.2.1 Background/Rationale

The Information, Educational Communication (IEC) Plan Framework is an important tool in establishing harmonious relationship between the BNRC and project stakeholders. It opens the line of an open interaction that will critically identify issues and concerns on the part of project stakeholders and a responsive mitigation measure to be developed by both project proponent and project stakeholders. The IEC plan goes beyond the objective of providing information or conducting dissemination activities. It focuses on providing on-going interaction between project proponent and stakeholders during the construction, operation and decommissioning phases. It provides information on the milestones and progress of development and issues during implementation stages. More meaningfully, IEC program will inculcate value formation by making the community and residents aware of their roles as project stakeholders. When the IEC program is conducted effectively, it is a significant confidence and trust-building tool for both the project stakeholders and the project proponent

5.1.2.2 Goals and Objectives

The IEC plan will seek to reach a broad-based population of various project stakeholders and sectoral groups that will be directly or indirectly affected by the project. It promotes a better understanding of the issues and concerns of the project stakeholders and BNRC, for the resolution of the issues and concerns through acceptable planned mitigation measures.
Specific Objectives:

- To provide better appreciation of the project goals and objectives, project description and components, identified impacts and corresponding social concerns and issues on the part of the project stakeholders, mitigation measures and project benefits
- To clarify misinformation and vague ideas about the project to reduce negative reactions as well as informed-decision among project stakeholders.
- To establish trust and confidence between stakeholders and the project proponent to pursue pro-active approaches and strategies to mitigate potential impacts and to enjoy an equitable distribution of the benefits of the project.

Table 5-2: IEC Plan Framework

Target Sector Identified as Needing Project IEC	Major Topics of Concern in Relation to Project	IEC Scheme/Strategy/Methods	Information Medium	Indicative Timelines and Frequency	Indicative Cost
a. Residents of Affected Barangays	1. Project description and status 2. Objective of EIA study/EIA Findings 3. Issues and concerns about the project 4. Building Trust and confidence 5. Rights and responsibilities of stakeholders/pro-active response to project operations: Monitoring/creation of MMTs	• Community assemblies • Group discussions • Interpersonal/CO approach • Deployment of Staff for continuing dissemination of information/organization of information/gatekeepers and peer facilitators • Radio/TV program • Virtual/online meeting	• Invitation letters • Primer about the project • Study tours to sites with good practice • Hand-outs on MMT creation, task and responsibilities • Flyers/Billboards/Public Information Brochure	• Pre-operation • Operation Phase (monthly) • Operation Phase (monthly) • Abandonment Phase (quarterly)	• Php 100,000
b. LGU: Regional, City, and Barangay Units	1. Project description and status 2. Project Impact 3. Objective of EIA Study/EIA Findings 4. Issues and concerns about the project 5. Mitigation measures 6. Building Trust and Confidence that mitigation measures will be undertaken 7. Rights and responsibilities of stakeholders/pro-active response to irrigation operations: Monitoring/creation of MMTs	• group methods • group workshops • group discussion • Interpersonal/ CO approach • one-on-one meetings • group workshop/ discussion • Virtual/online meeting	• Invitation Letters • One-on-one meetings • Primer about the project and EIA study • Study tours to sites with good practice • Flyers/Billboards/Public Information Brochure • Hand-outs on MMT and IA creation, task and responsibilities	• Pre-operation • Operation Phase (monthly) • Abandonment Phase (quarterly)	• Php 100,000
c. Sectoral Groups (NGOs, POs, Homeown	1. Project description and status 2. Project Impact 3. Objective of EIA Study/ 4. EIA Findings 5. Concerns about the project's	• Group methods • Community Consultations/ assemblies • Group Discussion	• Invitation Letters • One-on-one meetings	• Pre-operation	• Php 100,000

Target Sector Identified as Needing Project IEC	Major Topics of Concern in Relation to Project	IEC Scheme/Strategy/Methods	Information Medium	Indicative Timelines and Frequency	Indicative Cost
ers Association)	potential negative impact 6. Project benefits (community assistance, training, enterprise development, livelihood and employment, etc. 7. Rights and responsibilities of stakeholders/pro-active response to project operations: Monitoring/creation of MMTs	• Virtual/online meeting	• Primer about the project and EIA study • Study tours to sites with good practice • Hand-outs on MMT creation, task and responsibilities	• Pre-operation • Operation Phase (monthly) • Abandonment Phase (quarterly)	

d. Concerned agencies (DOTr,NHA, DPWH, HLURB, DENR, DSWD, DepEd, etc.)	1. Project Description and Status
	2. Project Impact
	3. Issues and Concerns about the project
	4. Mitigation Measures
	5. Rights and responsibilities of stakeholders/pro-active response to project operations: Monitoring/creation of MMTs
		• Community assembly
		• Group workshop/ discussion
		• Group workshop/ discussion
		• group workshop/ discussion
		• Virtual/online meeting
			• One-on-one meetings
			• Primer about the project and objectives of EIA
			• Group discussion
			• SDP presentation
			• Study tours to sites with good practice
			  • Hand-outs on MMT creation, task and responsibilities
			  • Flyers/Billboards/Public Information Brochure
				• Pre-operation
				• Operation Phase (monthly)
				• Abandonment Phase (quarterly)
					• Php 100,000

e. Worker's safety	1. Basic Occupational Health and safety 2. Safety and Health Protocols during the State of National Public Health Emergency	• Safety and Health Orientation	• One-on-one meetings • Public/Workplace Notices	• Upon employment for the basic health and safety orientation and annually thereafter	Php 100,000.00

6 ENVIRONMENTAL COMPLIANCE MONITORING

6.1 Self-Monitoring and Reporting Plan

The proponent through it Polluction Control Officer shall implement the monitoring plan and prepare the required monitoring report such as the Self-Monitoring Report (SMR) and the Compliance Monitoring Report (CMR) every quarter and semi-annual respectively. The report shall be submitted to the EMB MIMAROPA Office.

6.1.1.1 Water Quality

During operation, surface water quality monitoring will be undertaken at the selected sampling stations on a monthly basis. Parameters to be monitored are TSS, Oil and Grease, Salinity (freshwater), Temperature and pH.

6.1.1.2 Freshwater Ecology

Monitoring should be done at least every quarter for aquatic biota. This will track changes in the aquatic community and the database generated would serve as a reference in decision making in case any environment issue arises.

Because the effect of dredging may extend even after the dredging operations, it is recommended that monitoring should still be done at least two years from the end of the dredging activity.

6.1.1.3 People

The socio-economic monitoring will consist of monitoring the influx of workers during construction period and local employment for the operational phase. The distribution of benefits will also be monitored annually during the operational phase of the Project.

Table 6-1: Environmental Monitoring Plan

Project Phase / Environmental Aspect	Potential Impact per Environmental Sector	Parameters to be monitored	Phase	Sampling and Measurement Plan			Lead Person	Annual Estimated Cost (PHP)	EQPL Management Scheme					
									EQPL Range			EQPL Management Scheme		
				Method	Frequency	Location			Alert*	Action**	Limit	Alert*	Action**	Limit
The Land	Coastal Erosion/ deposition	Change in coastline configuration	Operation	Ocular spotting	Semi-annual	River mouth	BNRC	30,000	N/A	N/A	N/A	N/A	N/A	N/A
The People	Noise	Decibels (A)	Operation	Sound Meter	Monthly	River banks	BNRC	50,000	Complaints	Resolve complaints	Implement corrective action as necessary	Complaints	Resolve complaints	Implement corrective action as necessary
	Navigational Traffic	No. of fishers affected	Operation	Log Book	Monthly	Municipal Waters	BNRC	50,000	Complaints	Resolve complaints	Implement corrective action as necessary	Complaints	Resolve complaints	Implement corrective action as necessary
The Water	Increase in turbidity	TSS	Operation	Secchiu disk	Monthly	River channel	BNRC	20,000	60 mg/l	70 mg/l	80 mg/l	Investigate source and implement corrective action if necessary		
	Presence of oil and grease from machineries	Oil and grease	Operation and Abandonment	Water Quality Test	Quarterly	River channel	BNRC	50,000	1.6ppm	1.8ppm	2ppm	Investigate source and implement corrective action if necessary		

6.2 Environmental Guarantee and Monitoring Fund Commitments

6.2.1 Environmental Guarantee Fund

The amount for the allocation of an Environmental Guarantee Fund (EGF) shall be determined based on negotiations between proponent and EMB. Once costs are negotiated, the EGF will be established through a MOA and shall be used exclusively for the following purposes:

1. Immediate rehabilitation of areas affected by damages in the environment and the resulting deterioration of environmental quality as a direct consequence of project construction, operation and abandonment;
2. Just compensation of parties and communities affected by the negative impacts of the project;
3. Conduct of scientific or research studies related to the project that will aid in the prevention or rehabilitation of accidents and/or environmental damages; and
4. Contingency clean-up activities, environmental enhancement measures, damage prevention programs and social equity measures (e.g. livelihood, social development programs) including the continuing necessary IEC and capability building activities related to the project.

If costs from the EGF are insufficient to cover compensable claims, additional costs may be covered by the proponent. Whenever the EGF is below 50% of agreed level, it will be replenished by BNRC. The amount may be changed at the course of Project Operations.

6.2.2 Environmental Monitoring Fund

The EMF shall be exclusively utilized to cover all costs attendant to the operation of the MMT and shall be disbursed in accordance with the guidelines stipulated in the approved MMT Manual of Operations (MOO). The EMF shall be co-managed and co-administered by MMT Secretariat in accordance with the MOO and AWFP. A proposed Monitoring Fund of Php 150,000 is set for the monitoring activities.

7 DEMOBILIZATION / DECOMMISSIONING POLICY

Abandonment shall cover the demobilization of the dredging equipment.

In case abandonment is imperative due to force majeure or any other reasons, the structures, equipment and other related facilities may be used for other applications. Otherwise, the removal of structures, equipment and machineries from the existing site will be done to minimize possible threats to the surrounding environment.

An abandonment plan shall be formulated with consideration of the following:

- Advice and properly compensate affected employees; separation fees or compensation fees will be provided to any displaced employees;
- Machines / Equipment dismantled will be sold to interested parties;
- Removal of Solid, Liquid and Hazardous Wastes within the site through a DENR-certified Waste Transporter/ Treater; and
- Clean up and possible remediation of the site, if future evaluations and testing suggest such activity is applicable.

8 INSTITUTIONAL PLAN FOR EMP IMPLEMENTATION

8.1 Designation of Pollution Control Officer

Current DENR guidelines provide for the appointment of Pollution Control Officer (PCO) to oversee the EMP of the company. The position should be senior and the PCO should be technically qualified to oversee the implementation of the environmental management program.

The environmental commitments of the proponent will be thoroughly documented in the Environmental Compliance Certificate (ECC). These environmental commitments will be the minimum basis for monitoring activities by any interested party on the environmental performance of the company.

The proponent, through its Contractor shall hire a full-time Pollution Control Officer (PCO) who will also serve as the Health, Safety and Environmental Officer. The PCO will be accredited by the DENR and shall be required to attend regular PCO training to be accustomed with the environmental regulations pertaining to the project, especially those pertaining to the air and water quality. More importantly, the PCO will be thoroughly acquainted with the environmental management and monitoring plan of the project.

8.2 Compliance Reporting

As part of the duties of the PCO, regular reporting of compliance to DENR standards and other regulatory agencies shall be undertaken. The general schedule of reporting is indicated in the environmental monitoring plan.

8.3 Health and Safety

The BNRC shall subscribe to an active program of pursuing a healthy, safe and environment-friendly operation. It shall push for the adoption of industrial hygiene programs to ensure that a work environment shall be consistent with internationally accepted norms of industrial operations. Loss controls program, allied to the pursuit of the safety program, shall also be implemented and overseen by the PCO. In each section and shift, a safety officer shall be designated, and, together with the PCO, shall undergo health and safety training programs available from the Safety Organization of the Philippines.

Following the Company's guidelines on health and safety, it shall be made known and clear to Contractors and all employees during construction and operations. Strict compliance with these guidelines shall form part of the employees' code of conduct; sanctions and will be imposed upon violators. Safety evaluation within the Project site shall be conducted with the aim of continuously improving safety conditions.

The continuous availability of medical attention for sicknesses and medical emergencies and the provisions for first aid and emergency transport shall be made available at the Project construction site and may be shared with the nearby community.

8.4 Organization and Responsibilities

BNRC will be responsible for the dredging operation and the implementation of this dredging plan. The Inter-Agency Committee Monitoring Team shall conduct regular inspection of the dredging operations to monitor compliance with the safety policy, preventive maintenance program and

environmental regulations. Item VII. Section 2 of DAO 2020-07 prescribes the powers and functions of the IAC as follows a) serve as oversight for the implementation of dredging operations, b) recommend the suspension and/or cancellation of permits and/or clearances and c) propose policies and programs to rationalize the dredging operations.

The project organizational chart of BNRC shown in **Figure 8-1** presents the organization structure that will effectively accomplish the project within the design standard. The General Manager (GM) provides overall direction and oversees project operations. The Operation Manager (OM) ensures efficient daily operations and manages operation process, performance improvement and operations strategy. The OM ensures that the operations is within the design plan, monitors the progress of the dredging operation. The Administration and Finance Manager is responsible for the financial aspect of the project including procurement of supply materials and personnel salaries.

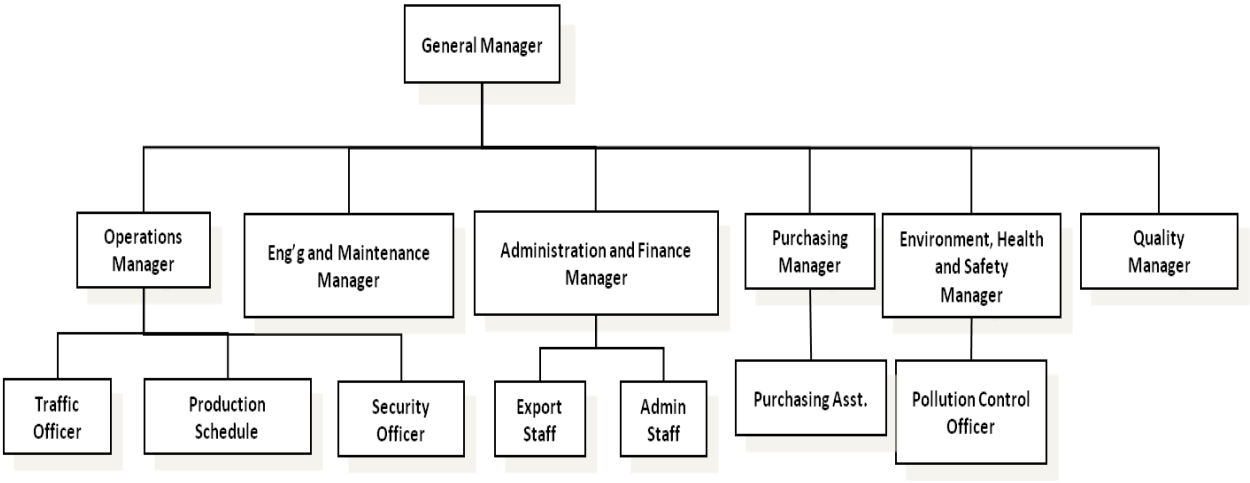


Figure 8-1: Project Organizational Chart

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Annex 1: Project Geographical Coordinates

ALAG RIVER GEOGRAPHIC COORDINATES

Corner	latitude	Latitude	longitude	Longitude	Corner	Latitude	Longitude
1	13.41569	13° 24' 56.50"	121.0918	121° 5' 30.53"	117	13° 22' 21.66"	121° 5' 30.03"
2	13.41522	13° 24' 54.79"	121.0921	121° 5' 31.48"	118	13° 22' 25.30"	121° 5' 33.47"
3	13.4143	13° 24' 51.47"	121.0924	121° 5' 32.53"	119	13° 22' 27.66"	121° 5' 35.28"
4	13.41288	13° 24' 46.36"	121.0922	121° 5' 31.78"	120	13° 22' 28.22"	121° 5' 39.38"
5	13.41198	13° 24' 43.13"	121.0921	121° 5' 31.41"	121	13° 22' 26.80"	121° 5' 41.53"
6	13.4096	13° 24' 34.57"	121.0931	121° 5' 35.12"	122	13° 22' 24.49"	121° 5' 41.74"
7	13.40856	13° 24' 30.81"	121.0936	121° 5' 36.88"	123	13° 22' 18.78"	121° 5' 41.61"
8	13.40769	13° 24' 27.67"	121.094	121° 5' 38.27"	124	13° 22' 15.39"	121° 5' 42.76"
9	13.40712	13° 24' 25.65"	121.0937	121° 5' 37.27"	125	13° 22' 13.62"	121° 5' 44.73"
10	13.40618	13° 24' 22.25"	121.0931	121° 5' 35.05"	126	13° 22' 12.64"	121° 5' 47.86"
11	13.40469	13° 24' 16.90"	121.0929	121° 5' 34.46"	127	13° 22' 13.84"	121° 5' 51.09"
12	13.40374	13° 24' 13.48"	121.0935	121° 5' 36.43"	128	13° 22' 17.87"	121° 5' 56.38"
13	13.4035	13° 24' 12.61"	121.0943	121° 5' 39.62"	129	13° 22' 18.17"	121° 6' 1.55"
14	13.40387	13° 24' 13.95"	121.0952	121° 5' 42.74"	130	13° 22' 19.02"	121° 6' 4.37"
15	13.40446	13° 24' 16.05"	121.0957	121° 5' 44.59"	131	13° 22' 21.04"	121° 6' 5.82"
16	13.40512	13° 24' 18.45"	121.0956	121° 5' 44.17"	132	13° 22' 23.76"	121° 6' 5.78"
17	13.40605	13° 24' 21.79"	121.0955	121° 5' 43.87"	133	13° 22' 27.67"	121° 6' 3.92"
18	13.4065	13° 24' 23.39"	121.0958	121° 5' 44.73"	134	13° 22' 30.52"	121° 6' 5.86"
19	13.40631	13° 24' 22.71"	121.0965	121° 5' 47.36"	135	13° 22' 32.19"	121° 6' 8.95"
20	13.4056	13° 24' 20.15"	121.0969	121° 5' 48.79"	136	13° 22' 33.07"	121° 6' 11.64"
21	13.40479	13° 24' 17.26"	121.0972	121° 5' 49.76"	137	13° 22' 35.16"	121° 6' 13.42"
22	13.40421	13° 24' 15.17"	121.0971	121° 5' 49.45"	138	13° 22' 36.27"	121° 6' 14.02"
23	13.40352	13° 24' 12.67"	121.0973	121° 5' 50.21"	139	13° 22' 39.10"	121° 6' 13.86"
24	13.40303	13° 24' 10.92"	121.0979	121° 5' 52.59"	140	13° 22' 41.89"	121° 6' 12.22"
25	13.40295	13° 24' 10.61"	121.099	121° 5' 56.23"	141	13° 22' 44.04"	121° 6' 8.88"
26	13.40314	13° 24' 11.30"	121.0998	121° 5' 59.21"	142	13° 22' 45.37"	121° 6' 6.81"
27	13.40393	13° 24' 14.13"	121.1006	121° 6' 2.17"	143	13° 22' 47.46"	121° 6' 4.97"
28	13.40478	13° 24' 17.22"	121.1013	121° 6' 4.68"	144	13° 22' 50.05"	121° 6' 3.51"
29	13.40556	13° 24' 20.01"	121.102	121° 6' 7.17"	145	13° 22' 51.31"	121° 6' 2.07"
30	13.40571	13° 24' 20.56"	121.1029	121° 6' 10.36"	146	13° 22' 52.52"	121° 5' 59.93"
31	13.40524	13° 24' 18.86"	121.1035	121° 6' 12.44"	147	13° 22' 52.55"	121° 5' 57.43"
32	13.40448	13° 24' 16.13"	121.1038	121° 6' 13.74"	148	13° 22' 51.53"	121° 5' 54.98"
33	13.40364	13° 24' 13.10"	121.1038	121° 6' 13.78"	149	13° 22' 50.52"	121° 5' 52.35"
34	13.40261	13° 24' 9.41"	121.1034	121° 6' 12.18"	150	13° 22' 51.05"	121° 5' 51.16"
35	13.40135	13° 24' 4.84"	121.1028	121° 6' 10.05"	151	13° 22' 52.47"	121° 5' 50.69"
36	13.4003	13° 24' 1.09"	121.1022	121° 6' 8.09"	152	13° 22' 53.72"	121° 5' 51.51"
37	13.39977	13° 23' 59.18"	121.1017	121° 6' 6.01"	153	13° 22' 53.89"	121° 5' 53.23"
38	13.39918	13° 23' 57.04"	121.1008	121° 6' 2.94"	154	13° 22' 53.78"	121° 5' 55.08"
39	13.39817	13° 23' 53.43"	121.1002	121° 6' 0.64"	155	13° 22' 54.76"	121° 5' 57.61"
40	13.39756	13° 23' 51.23"	121.1001	121° 6' 0.18"	156	13° 22' 56.91"	121° 6' 0.32"
41	13.39537	13° 23' 43.35"	121.1004	121° 6' 1.51"	157	13° 22' 58.97"	121° 6' 2.15"
42	13.39404	13° 23' 38.54"	121.1008	121° 6' 2.72"	158	13° 23' 1.46"	121° 6' 3.19"
43	13.39318	13° 23' 35.44"	121.1012	121° 6' 4.25"	159	13° 23' 3.29"	121° 6' 4.01"
44	13.39256	13° 23' 33.22"	121.1021	121° 6' 7.47"	160	13° 23' 4.92"	121° 6' 6.18"
45	13.39188	13° 23' 30.76"	121.1033	121° 6' 11.78"	161	13° 23' 6.47"	121° 6' 9.09"
46	13.39138	13° 23' 28.98"	121.1041	121° 6' 14.87"	162	13° 23' 6.82"	121° 6' 12.05"
47	13.39054	13° 23' 25.95"	121.1049	121° 6' 17.67"	163	13° 23' 6.37"	121° 6' 14.66"
48	13.38945	13° 23' 22.04"	121.1055	121° 6' 19.65"	164	13° 23' 5.05"	121° 6' 16.90"

ALAG RIVER GEOGRAPHIC COORDINATES

49	13.38874	13° 23' 19.45"	121.1056	121° 6' 20.24"	165	13° 23' 3.19"	121° 6' 18.56"
50	13.38767	13° 23' 15.60"	121.1055	121° 6' 19.93"	166	13° 23' 1.12"	121° 6' 19.99"
51	13.38684	13° 23' 12.61"	121.1058	121° 6' 20.85"	167	13° 22' 59.77"	121° 6' 21.79"
52	13.38576	13° 23' 8.74"	121.1061	121° 6' 22.09"	168	13° 22' 59.26"	121° 6' 23.59"
53	13.38516	13° 23' 6.57"	121.1068	121° 6' 24.42"	169	13° 22' 59.85"	121° 6' 25.66"
54	13.3844	13° 23' 3.83"	121.1071	121° 6' 25.60"	170	13° 23' 1.22"	121° 6' 26.86"
55	13.38394	13° 23' 2.19"	121.1072	121° 6' 25.98"	171	13° 23' 2.60"	121° 6' 27.16"
56	13.38365	13° 23' 1.14"	121.1069	121° 6' 24.76"	172	13° 23' 5.76"	121° 6' 26.79"
57	13.38385	13° 23' 1.87"	121.1061	121° 6' 21.81"	173	13° 23' 8.34"	121° 6' 25.22"
58	13.38435	13° 23' 3.65"	121.1056	121° 6' 20.17"	174	13° 23' 9.72"	121° 6' 23.27"
59	13.38533	13° 23' 7.20"	121.1047	121° 6' 17.00"	175	13° 23' 12.52"	121° 6' 22.60"
60	13.38559	13° 23' 8.11"	121.1041	121° 6' 14.59"	176	13° 23' 17.42"	121° 6' 21.56"
61	13.38576	13° 23' 8.72"	121.1034	121° 6' 12.40"	177	13° 23' 20.07"	121° 6' 21.69"
62	13.38567	13° 23' 8.42"	121.1025	121° 6' 8.86"	178	13° 23' 25.00"	121° 6' 21.22"
63	13.38532	13° 23' 7.17"	121.1017	121° 6' 6.21"	179	13° 23' 29.50"	121° 6' 17.30"
64	13.38475	13° 23' 5.11"	121.1009	121° 6' 3.37"	180	13° 23' 33.32"	121° 6' 13.14"
65	13.38451	13° 23' 4.23"	121.1007	121° 6' 2.58"	181	13° 23' 35.45"	121° 6' 9.76"
66	13.38373	13° 23' 1.43"	121.1004	121° 6' 1.48"	182	13° 23' 37.41"	121° 6' 6.13"
67	13.38324	13° 22' 59.68"	121.1002	121° 6' 0.75"	183	13° 23' 39.59"	121° 6' 3.99"
68	13.3828	13° 22' 58.07"	121.0998	121° 5' 59.22"	184	13° 23' 42.05"	121° 6' 3.38"
69	13.38228	13° 22' 56.19"	121.0992	121° 5' 57.13"	185	13° 23' 47.74"	121° 6' 3.24"
70	13.38212	13° 22' 55.63"	121.0987	121° 5' 55.21"	186	13° 23' 51.35"	121° 6' 5.08"
71	13.38216	13° 22' 55.78"	121.0979	121° 5' 52.48"	187	13° 23' 57.66"	121° 6' 7.95"
72	13.38207	13° 22' 55.44"	121.0975	121° 5' 50.85"	188	13° 24' 1.32"	121° 6' 10.86"
73	13.38179	13° 22' 54.46"	121.0971	121° 5' 49.51"	189	13° 24' 5.34"	121° 6' 13.72"
74	13.3812	13° 22' 52.31"	121.0969	121° 5' 48.90"	190	13° 24' 9.66"	121° 6' 15.64"
75	13.38064	13° 22' 50.32"	121.0971	121° 5' 49.56"	191	13° 24' 14.46"	121° 6' 16.99"
76	13.38025	13° 22' 48.88"	121.0974	121° 5' 50.72"	192	13° 24' 18.73"	121° 6' 16.30"
77	13.38007	13° 22' 48.27"	121.0978	121° 5' 52.13"	193	13° 24' 21.33"	121° 6' 14.25"
78	13.3804	13° 22' 49.43"	121.0985	121° 5' 54.70"	194	13° 24' 22.54"	121° 6' 12.03"
79	13.38076	13° 22' 50.74"	121.099	121° 5' 56.47"	195	13° 24' 22.18"	121° 6' 8.34"
80	13.38088	13° 22' 51.17"	121.0998	121° 5' 59.43"	196	13° 24' 21.33"	121° 6' 4.95"
81	13.38056	13° 22' 50.01"	121.1005	121° 6' 1.88"	197	13° 24' 18.93"	121° 6' 2.63"
82	13.38001	13° 22' 48.04"	121.1008	121° 6' 2.96"	198	13° 24' 15.17"	121° 5' 59.90"
83	13.37938	13° 22' 45.76"	121.1012	121° 6' 4.39"	199	13° 24' 13.55"	121° 5' 57.94"
84	13.3789	13° 22' 44.05"	121.1016	121° 6' 5.83"	200	13° 24' 12.91"	121° 5' 55.33"
85	13.37851	13° 22' 42.64"	121.1023	121° 6' 8.24"	201	13° 24' 13.93"	121° 5' 52.59"
86	13.37803	13° 22' 40.89"	121.1029	121° 6' 10.34"	202	13° 24' 15.88"	121° 5' 51.47"
87	13.37751	13° 22' 39.03"	121.1033	121° 6' 12.04"	203	13° 24' 18.19"	121° 5' 51.22"
88	13.37722	13° 22' 38.01"	121.1035	121° 6' 12.56"	204	13° 24' 21.04"	121° 5' 50.95"
89	13.37664	13° 22' 35.90"	121.1034	121° 6' 12.34"	205	13° 24' 23.71"	121° 5' 50.06"
90	13.37634	13° 22' 34.84"	121.103	121° 6' 10.90"	206	13° 24' 24.94"	121° 5' 47.59"
91	13.37618	13° 22' 34.26"	121.1021	121° 6' 7.45"	207	13° 24' 25.48"	121° 5' 45.10"
92	13.37587	13° 22' 33.12"	121.1012	121° 6' 4.46"	208	13° 24' 24.55"	121° 5' 43.08"
93	13.37541	13° 22' 31.47"	121.1008	121° 6' 2.90"	209	13° 24' 22.81"	121° 5' 41.63"
94	13.37458	13° 22' 28.47"	121.1006	121° 6' 2.22"	210	13° 24' 20.93"	121° 5' 41.13"
95	13.37385	13° 22' 25.87"	121.1008	121° 6' 2.74"	211	13° 24' 17.97"	121° 5' 41.00"
96	13.37287	13° 22' 22.34"	121.1013	121° 6' 4.53"	212	13° 24' 15.87"	121° 5' 40.66"

ALAG RIVER GEOGRAPHIC COORDINATES

97	13.37243	13° 22' 20.73"	121.1011	121° 6' 3.83"	213	13° 24' 14.97"	121° 5' 39.56"
98	13.37218	13° 22' 19.85"	121.1005	121° 6' 1.89"	214	13° 24' 15.01"	121° 5' 38.03"
99	13.37219	13° 22' 19.87"	121.0999	121° 5' 59.61"	215	13° 24' 16.18"	121° 5' 36.71"
100	13.37191	13° 22' 18.86"	121.0985	121° 5' 54.51"	216	13° 24' 19.17"	121° 5' 36.92"
101	13.37097	13° 22' 15.50"	121.0974	121° 5' 50.74"	217	13° 24' 22.51"	121° 5' 38.57"
102	13.37069	13° 22' 14.47"	121.0969	121° 5' 48.90"	218	13° 24' 25.23"	121° 5' 40.50"
103	13.3708	13° 22' 14.89"	121.0962	121° 5' 46.21"	219	13° 24' 28.92"	121° 5' 40.89"
104	13.37137	13° 22' 16.93"	121.0956	121° 5' 44.01"	220	13° 24' 31.81"	121° 5' 39.46"
105	13.37236	13° 22' 20.49"	121.0954	121° 5' 43.43"	221	13° 24' 34.77"	121° 5' 38.08"
106	13.37391	13° 22' 26.08"	121.0954	121° 5' 43.32"	222	13° 24' 37.68"	121° 5' 38.25"
107	13.37503	13° 22' 30.10"	121.0951	121° 5' 42.35"	223	13° 24' 44.64"	121° 5' 35.25"
108	13.37525	13° 22' 30.90"	121.0941	121° 5' 38.70"	224	13° 24' 53.94"	121° 5' 36.57"
109	13.37491	13° 22' 29.69"	121.0931	121° 5' 35.26"	225	13° 24' 55.11"	121° 5' 36.15"
110	13.37437	13° 22' 27.72"	121.0925	121° 5' 32.95"	226	13° 24' 59.83"	121° 5' 35.70"
111	13.37352	13° 22' 24.68"	121.0919	121° 5' 30.70"	227	13° 25' 3.61"	121° 5' 32.45"
112	13.37283	13° 22' 22.20"	121.091	121° 5' 27.73"	228	13° 25' 4.55"	121° 5' 31.24"
113	13.37239	13° 22' 20.60"	121.0902	121° 5' 24.55"	229	13° 25' 5.20"	121° 5' 27.56"
114	13.37155	13° 22' 17.58"	121.0894	121° 5' 21.94"	230	13° 25' 2.85"	121° 5' 24.63"
115	13.37126	13° 22' 16.55"	121.0897	121° 5' 22.96"	231	13° 24' 56.50"	121° 5' 30.53"
116	13.3718	13° 22' 18.49"	121.0903	121° 5' 24.91"			

ALAG RIVER DELTA

Corner	Latitude	Longitude
1	13°25′36.29″ N	121°05′30.36″ E
2	13°25′05.22″ N	121°05′27.55″ E
3	13°25′02.86″ N	121°05′24.67″ E
4	13°25′05.57″ N	121°04′52.87″ E
5	13°25′11.55″ N	121°04′53.73″ E
6	13°25′17.21″ N	121°04′55.65″ E
7	13°25′22.42″ N	121°04′58.70″ E
8	13°25′26.96″ N	121°05′02.59″ E
9	13°25′30.74″ N	121°05′07.18″ E
10	13°25′33.77″ N	121°05′12.59″ E
11	13°25′35.62″ N	121°05′18.27″ E
12	13°25′36.49″ N	121°05′24.32″ E

Annex 2: DENR Administrative Order 2019–14

Republic of the Philippines
Department of Environment and Natural Resources
Visayas Avenue, Diliman, Quezon City
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NOV 0 4 2019

DENR ADMINISTRATIVE ORDER NO. 14, S. 2019

SUBJECT : **RATIONALIZING DREDGING ACTIVITIES IN THE HEAVILY-SILTED RIVER CHANNELS WITHIN THE PROVINCE OF ORIENTAL MINDORO PURSUANT TO THE DENR-DPWH-DILG-DOTR JOINT MEMORANDUM CIRCULAR NO. 1 SERIES OF 2019**

Pursuant to Section 2, Article XII of the 1987 Constitution, the Department's mandate under Executive Order No. 292 or the Administrative Code of the Philippines, and Section 5.4 of DENR-DPWH-DILG-DOTr Joint Memorandum Circular No. 2019-01, in order to protect and properly manage the disposition of sand as well as restore the natural state and water flow of the heavily-silted river channels in the Province of Oriental Mindoro, the following guidelines are hereby prescribed:

I.

GENERAL PROVISIONS

Section 1. ***Coverage.*** This Order shall cover the implementation of the DENR River Restoration thru Dredging Activities as embodied in Section 5.4 of the DENR-DPWH-DILG-DOTr Joint Memorandum Circular No. 2019-01 in the heavily-silted river channels in the Province of Oriental Mindoro.

Section 2. ***Scope of Operations.*** In order to open heavily-silted river channels of Oriental Mindoro, the areas starting from the coastline of river deltas extending all the way upstream, as may be determined by the Provincial Government in accordance with the DPWH Dredging Master Plan, are hereby declared exclusive River Dredging Zones (RDZ). Only dredging activities shall be allowed within the RDZ, quarrying is strictly prohibited.

Section 3. ***Rationale and Objectives***

a) The flow of materials and sediment from the upland that flank down the major river systems thereby causing its aggradation became the long-term direct culprit of massive flooding in the various barangays and municipalities of the province of Oriental Mindoro.

b) It is necessary to protect and properly manage the utilization of the sand and gravel in the province of Oriental Mindoro to improve the water flows of its river systems, ensure the integrity of the various protective dikes and infrastructures, thereby reduce risks to lives and properties.

c) In order to restore the natural state and water flow of the heavily-silted river systems and improve its hydraulic capacity thereby eliminate flooding, large-scale dredging and desilting operations, based on a comprehensive dredging plan, must be implemented.

Section 4. ***Declaration of Policies***

a) The exclusive authority of the province to issue permit to extract sand, gravel and other quarry resources, pursuant to the ordinance of the Sangguniang Panlalawigan, under Republic Act No. 7160 is covered by Section 5.1 of JMC 2019-01 or the Dredging with Commercial Utilization of Dredged Materials in favor of a mining permit holder under the Industrial Sand and Gravel (ISAG) or Commercial Sand and Gravel (CSAG) quarry permit.

b) River Restoration through Dredging Activities under Section 5.4 of JMC 2019-01 does not cover an ISAG or CSAG regime since the activity to be undertaken is dredging and

not quarrying. This will not preclude, however, the entitlement of the province of Oriental Mindoro to the share from the commercial disposal of the dredged material in addition to the undertaking of the permit holder to restore the river thru dredging.

c) Local Government Units are entitled to their equitable share derived from the utilization and development of the national wealth within their respective areas under the Section 138 of the Local Government Code of 1991.

d) The State is allowed by the Constitution to enter into agreements with private sector entities to bolster the national economy through the sustainable utilization of minerals.

e) Disposal of dredged or extracted materials under this Order shall be governed by the principle according to which the government expects a reasonable return for its utilization, while holders of dredging clearance expect a reasonable return for its dredging operations while restoring the river to its original state.

Section 5. *No Funding from the Government.* No funding from the government shall be made for the conduct of dredging activities by the private sector. Holders of Dredging Clearance shall provide the financing, technology, management and personnel necessary to implement dredging activities within the exclusive RDZ.

II.

QUALIFICATIONS OF LARGE-SCALE DREDGING OPERATORS

Section 1. *Who May Apply.* Any citizen of the Philippines or a SEC-registered corporation, partnership, or association established to engage in construction, and development and/or dredging operations, with technical and financial capability to undertake large-scale flood control dredging and desilting operation in the Province of Oriental Mindoro. To implement efficient and cost-effective large-scale dredging operations, individual corporations may pool their resources, organize themselves and apply as a consortium.

Section 2. *Financial Capacity.* Applicants must possess the following:

a) Individual applicants must possess the financial capacity by showing proof of not less than P250,000,000.00 in asset value through the submission of an Audited Financial Statement, credit lines and/or income tax returns for the preceding three (3) years and other documents that may be required by the concerned DENR agency;

b) For a corporation, partnership, association or a consortium, its capital must be at least sixty per centum (60%) owned by citizens of the Philippines with a minimum authorized capital stock of One Billion Pesos (₱ 1,000,000,000.00), twenty-five percent (25%) of which is subscribed and twenty-five percent (25%) of that subscribed is paid-up. In no case shall the paid up capital be less than P250,000,000.00. For consortiums, one of its members must possess these qualifications.

Section 3. *Technical Competence.* In addition to the above requirements, only applicants capable of implementing large-scale dredging activities for flood mitigation or prevention purposes in the heavily-silted river channels within the Province of Oriental Mindoro, based on their technical knowledge and verifiable previous track record conducting such activities, as properly vetted, duly certified and approved by the appropriate DENR and DPWH offices.

Section 4. *Other requirements.* In addition to the above-stated requirements, the proponent shall:

a) Deploy all their equipment within 30 days from the Notice to Proceed (NTP) to be issued by the Provincial Government and the equipment shall be under the name of the company, either chartered or leased, and capable of undertaking large scale dredging activity.

b) Post a Cash Bond in the amount of Twenty Million Pesos (₱ 20,000,000.00), to be held in an account in the Province of Oriental Mindoro, to ensure compliance with this Order and other applicable environmental laws, rules and regulations.

c) Secure the required clearances from the appropriate government office including a certification of no pending case relating to compliance with existing environmental laws, rules and regulations, and an undertaking that it will never be involved in such.

d) Undertake protection of the rivers banks from erosion and provide necessary engineering intervention to support the vital infrastructures along the river, pursuant to the dredging clearance approved by the DPWH.

e) Secure the necessary permit from the Provincial Government and pay the required National and Local Tax as required by law.

III.

DENR RIVER RESTORATION THROUGH DREDGING ACTIVITIES

Section 1. ***Prior Determination of Mineral Contents.*** Upon determination of the RDZ, the Mines and Geosciences Bureau (MGB) shall conduct a survey of the non-metallic and metallic resources on the RDZ. Once a prior determination of the metallic and other valuable materials in economic quantities is established, the proponent shall, in addition to the payment of taxes, pay the corresponding fees prescribed by the MGB.

Section 2. ***Application for Issuance of Dredging Clearance.*** The application for the issuance of Dredging Clearance must be accompanied by the endorsement of the Governor and shall be governed by this Order and other applicable DENR laws, rules and issuances.

Section 3. ***Prescribed Extraction Method.*** Holders of dredging clearance under this Order shall adopt the sequence and mode of extraction approved by the DPWH and implement the same in accordance with the duly approved work program in order to ensure a systematic and responsible extraction/utilization/disposition of sand and gravel from river channels.

Section 4. ***Prescribed Dredging Method.*** In order to restore the natural state and flow of the river and taking into consideration the essential role played by constant sand replenishment, all dredging activities shall be initially conducted at deltas of heavily-silted river channels of Oriental Mindoro, for a period of six (6) months, with the objective of creating navigational channel and providing more depth for passage of dredging vessel/s to implement true flood control measures within the RDZ.

IV.

ENVIRONMENTAL MANAGEMENT

Section 1. ***Environmental Compliance.*** All holders of dredging clearance shall comply with the pertinent laws, rules and regulations on environmental protection, the allocation of funds for environment-related expenditures, environmental impact assessment, and setting up of the contingent liability and rehabilitation fund, among others.

Section 2. Programmatic Environmental Impact Assessment or Strategic Environmental Assessment per River Channel. In view of the required issuance of ECC on the one (1) Master Dredging Plan per river channel to be issued/approved by the DPWH for the heavily-silted river channels in Oriental Mindoro, the EMB RO IV-B shall conduct the Programmatic EIA or SEA for each river system in coordination with MGB, DPWH and the Provincial Government. The Provincial Government may be the proponent for the Programmatic EIA and SEA.

Section 3. *Application for Issuance of ECC.* Upon endorsement of the Provincial Governor, all ECC applications for large-scale dredging in heavily-silted river channels in Oriental Mindoro shall be filed with the EMB RO IV-B.

Section 4. *Extraction Limit.* In view of the large-scale river dredging operations involving the heavily-silted river channels in Oriental Mindoro within the RDZ from the river delta extending all the way upstream and its high replenishment rate/s, the issuance of ECC per river channel shall not be subject to any extraction limit, provided that:

a) The extraction activities conform with the approved work program in accordance with the DPWH Dredging Master Plan;

b) Assessment of the river systems shall be done by the team composed of representatives from PENRO, CENRO and the MGB every two (2) years; and

c) The maximum allowable extraction conforms to the designated mitigating measures based on the environmental impact assessment.

V.

MEMORANDUM OF AGREEMENT WITH DENR

Section 1. *Authority to Dispose.* A holder of an approved Dredging Clearance shall enter into a Memorandum of Agreement (MOA) with the DENR – Regional Office (RO) IV-B wherein the holder is granted the authority to dispose materials extracted from the RDZ.

Section 2. *Accreditation as Trader.* All holders of dredging clearance issued by the DPWH or entities duly authorized or contracted by holders of dredging clearance to market and/or commercially dispose dredged or extracted materials should be accredited as traders/retailers/dealers. The Certificate of Accreditation shall be issued by the DENR through the MGB RO IV-B.

Section 3. *Transport Permit.* Ore Transport Permit (OTP) and/or Mineral Ore Export Permit (MOEP) shall be included in the MOA executed between the DENR RO IV-B and the holder of the dredging clearance who has been accredited as a trader. *Provided*, that a written notice prior to shipment or transport of dredged and/or extracted suitable materials shall be furnished to the MGB RO IV-B for the purpose of monitoring dredging activities in the RDZ.

Section 4. *Excise Tax.* The excise tax on locally extracted or produced non-metallic minerals and quarry resources will be based on the actual market value of the gross output thereof at the time of removal. The Excise Tax shall be timely and completely paid to the nearest Bureau of Internal Revenue Office in the province concerned.

Section 5. *Work Deviation.* Any deviation of more than 15% from the approved work program in any of the activities involved, without the prior concurrence of the DPWH in coordination with the DENR through the MGB RO IV-B shall be sufficient ground for the suspension/cancellation of pertinent permits and clearances.

VI.

OPERATIONS PERMIT WITH THE LOCAL GOVERNMENT

Section 1. *Operations Permit.* No Operations Permit, Notice of Award and Notice to Proceed shall be issued by the Provincial Government pursuant to this Order, unless the applicant has a valid MOA with DENR RO IV-B, has been duly accredited as a trader, and has secured a dredging clearance for flood control dredging and desilting activities in RDZ from the Secretary of the DPWH or its authorized representative based on DPWH-issued one river-specific Dredging Master Plan.

Section 2. *Monitoring and Supervision Fee.* A monitoring and supervision fee which shall not be less than five percent (5%) of the market value of the gross output of the materials

extracted from the covered area within the RDZ, exclusive of all other taxes, shall be paid to the provincial government for purposes of monitoring and ensuring compliance with this Order and other related issuances.

Section 3. *Extraction Fee*. Suitable materials for commercial disposition shall be subject to extraction fee, to be collected by the Provincial Government of Oriental Mindoro, in accordance with the Local Government Code.

VII.

MONITORING AND ENFORCEMENT

Section 1. *Creation of Inter-Agency Committee.* An inter-agency committee shall be created, composed of the following:

a) Governor of the Province of Oriental Mindoro as Chairperson;
b) DENR Regional Executive Director IV-B as Vice-Chairperson;
c) DPWH Regional Director IV-B Director as Member;
d) MGB Regional Director IV-B as Member; and
e) EMB Regional Director IV-B, as Member.

Section 2. *Powers and Functions of the Inter-Agency Committee.* The inter-agency committee shall have the following powers and functions:

a) Serve as oversight for the implementation of this Administrative Order and monitoring of the dredging operations;
b) Shall recommend the suspension and/or cancellation of permits and/or clearances; and
c) Shall propose policies and programs to rationalize the dredging operations.

VIII.

FINAL PROVISIONS

Section 1. *Subjectivity to Other Laws*. This Order shall be subject to the Constitution, and all pertinent laws, guidelines and issuances.

Section 2. *Repealing Clause*. All Orders, issuances, rules and regulations, or parts thereof which are inconsistent with this Order are hereby repealed or modified accordingly.

Section 3. *Separability*. The provisions of this Order are hereby declared to be separable. If any part or provision of this Order shall be declared invalid, the remaining portions or provisions shall not be affected thereby and shall be construed as if it did not contain the particular invalid term or provision.

Section 4. *Suppletory Clause*. In case of violation and/or non-compliance with the provisions of this Administrative Order, the pertinent penal provisions under R.A. 7942, Presidential Decree No. 1586 and other applicable laws, rules and regulation shall be applied suppletory hereto.

Section 5. *Effectivity*. This Administrative Order shall take effect fifteen (15) days following its complete publication in a newspaper of general circulation and registration with the Office of the Administrative Register.

Issued on NOV 0 4 2019, in Quezon City.

ROY A. CIMATU
Secretary

REPUBLIC OF THE PHILIPPINES
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
SENR057491

PUBLICATION: Inquirer Bandera
December 06, 2019
ACKNOWLEDGEMENT: U.P. LAW CENTER
December 12, 2019

Annex 3: IAC Resolution No. 2023-02

Republic of the Philippines
PROVINCIAL GOVERNMENT OF ORIENTAL MINDORO
Provincial Capitol Complex, Calapan City, Oriental Mindoro

INTER-AGENCY COMMITTEE FOR RIVER RESTORATION AND DREDGING ACTIVITIES

IAC RESOLUTION NO. 02 - 2023

A RESOLUTION OPENING THE SUBMISSION OF LETTERS OF INTENT, AND PROOF OF FINANCIAL AND TECHNICAL CAPACITIES OF INTERESTED APPLICANTS FOR LONGOS RIVER, ALAG RIVER, SUBAANG RIVER, WASIG RIVER, CAGANKAN RIVER, MANSALAY RIVER, PULA RIVER, MAUJAO RIVER, AND CAWACAT RIVER

WHEREAS, DENR-DPWH-DILG-DOTr Joint Memorandum Circular No. 01, Series of 2019 (JMC 1-2019) provides for the *"Guidelines on the Issuance of Clearance and/or Permit for Dredging Within Waterways or Other Inland Bodies of Water"* as the primary basis to promote the government's flood control efforts.

WHEREAS, in accordance with the mandate of DENR Department Administrative Order No. 14, Series of 2019 (DAO 14-2019), the Inter-Agency Committee (IAC) shall propose policies and programs to rationalize the dredging operations in the Province of Oriental Mindoro.

WHEREAS, by virtue of IAC Resolution No. 01-2023 dated 30 March 2023, the IAC cancelled the Notices of Award / Pre-Qualification of Bataan Aggregates Corporation Joint Venture Anglo Philippine Holdings Corporation, and Vibranium Land Development Technology, OPC for Longos River; and River Delta Development Corporation, for Alag River.

WHEREAS, based on the two (2) studies conducted by Mines and Geosciences Bureau (hereinafter, "MGB") Region IV-B MIMAROPA Report on the Identified River Dredging Zones (RDZs) in the Province of Oriental Mindoro, and recent flooding incidents the following river systems are recommended large scale dredging activities:

1. Longos River (Barangay San Andres, Baco, Or. Mindoro).
2. Alag River (Barangay Water, Baco, Or. Mindoro).
3. Subaang River (Barangay Lumangbayan, San Teodoro, Or. Mindoro).
4. Wasig River (Barangay Wasig, Mansalay, Or. Mindoro).
5. Cagankan River (Barangay Don Pedro, Mansalay, Or. Mindoro).
6. Mansalay River (Barangay Poblacion, Mansalay, Or. Mindoro).
7. Pula River (Barangay Calima, Pola, Or. Mindoro);
8. Maujao River (Barangay Maujao, Bulalacao, Or. Mindoro); and
9. Cawacat River (Barangay Campaasan, Bulalacao, Or. Mindoro).

NOW THEREFORE, resolved as it is hereby resolved:

Resolved, to invite interested proponents willing to undertake River Restoration through Large-Scale Dredging Activities to submit respective Letters of Intent, and Proof of Financial and Capacities to the Secretariat for River Restoration and Dredging Activities in the Province of Oriental Mindoro, from 31 March 2023, until 14 April 2023, for the following river systems:

1. Cluster of Alag River and Longos River, in Baco, Oriental Mindoro;
2. Cluster of Wasig River, Cagankan River, Mansalay River, in Mansalay, Oriental Mindoro;
3. Cluster of Maujao River and Cawacat River, in Bulalacao, Oriental Mindoro;
4. Subaang River, in San Teodoro, Oriental Mindoro; and

5. Pula River, in Pola, Oriental Mindoro.

Resolved further, the IAC hereby agreed to adopt the following schedule of activities:

Posting of Notices	01 April 2023 – 14 April 2023
Evaluation	15 April 2023 – 21 April 2023
Award	Between 24 April 2023 – 28 April 2023

ENACTED during the IAC meeting held on the 30th day of March 2023 at the Office of the Governor, 2nd Floor Provincial Capitol Complex, Governor Ignacio St., Barangay Camilmil, Calapan City, Oriental Mindoro

REFERENDUM

	APPROVED	DISAPPROVED	REMARKS
GOV. HUMERLITO A. DOLOR, MPA, PH.D.			
RED LORMELYN E. CLAUDIO, CESO IV DENR-MIMAROPA REGION			
RD GERALD A. PACANAN, CESO III DPWH – REGION IV-B			
RD GLENN MARCELO C. NOBLE MGB - MIMAROPA			
RD JOE AMIL M. SALINO EMB-MIMAROPA			

x----------x

CERTIFICATION

I hereby certify that the abovementioned resolution was duly approved by the Inter-Agency Committee during its meeting on the 30th day of March 2023 at the Office of the Governor, 2nd Floor Provincial Capitol Complex, Governor Ignacio St., Barangay Camilmil, Calapan City, Oriental Mindoro.

ATTY. EARL LIGORIO R. TURANO II
Provincial Legal Officer,
Secretariat for River Restoration and Dredging Activities in the Province of Oriental Mindoro

Annex 4: Provincial Government of Oriental Mindoro Public Notice

Republic of the Philippines
PROVINCE OF ORIENTAL MINDORO

PROVINCIAL ADMINISTRATOR'S OFFICE

NOTICE TO THE PUBLIC
31 March 2023

NOTICE IS HEREBY GIVEN, that pursuant to the provisions of DPWH-DENR-DILG – DOTr Joint Memorandum Circular No. 1, Series of 2019, DENR Department Administrative Order No. 14 Series of 2019; and the Inter-Agency Committee (IAC) on Rationalizing Dredging Activities in the Heavily Silted River Channels within the Province of Oriental Mindoro's Resolution Nos. 01-2023 and 02-2023, issued on 30 March 2023, the Provincial Government of Oriental Mindoro (PGOM) is now accepting ***Letters of Intent and/ or Proposals*** from private sector proponents who are willing, and financially and technically capable to undertake river restoration, through large-scale dredging activities, in the following river systems:

1. **Alag River (Barangay Water, Baco, Or. Mindoro)**
2. **Longos River (Barangay San Andres, Baco, Or. Mindoro)**
3. **Subaang River (Barangay Lumangbayan, San Teodoro, Or. Mindoro)**
4. **Wasig River (Barangay Wasig, Mansalay, Or. Mindoro)**
5. **Cagankan River (Barangay Don Pedro, Mansalay, Or. Mindoro)**
6. **Mansalay River (Barangay Poblacion, Mansalay, Or. Mindoro)**
7. **Pula River (Barangay Calima, Pola, Or. Mindoro)**
8. **Maujao River (Barangay Maujao, Bulalacao, Or. Mindoro); and**
9. **Cawacat River (Barangay Campaasan, Bulalacao, Or. Mindoro).**

The aforementioned river systems shall form clusters on the basis of the following classifications:

1. **Cluster of Alag River and Longos River, in Baco, Oriental Mindoro;**
2. **Cluster of Wasig River, Cagankan River, Mansalay River, in Mansalay, Oriental Mindoro;**
3. **Cluster of Maujao River and Cawacat River, in Bulalacao, Oriental Mindoro;**
4. **Subaang River, in San Teodoro, Oriental Mindoro; and**
5. **Pula River, in Pola, Oriental Mindoro.**

Interested parties shall submit the following documents pursuant to Chapter II (Qualification of Large-Scale Dredging Operators) DENR DAO No. 14, Series of 2019, to wit:

1. **Letter of Intent**

2. **Business Registration**

3. **Proof of Financial Capacity:**

   For Individual Applicants –not less than P250,000,000.00 in asset value through the submission of an Audited Financial Statement, credit lines and/or income tax returns for the preceding three (3) years and other documents that may be required by the concerned DENR agency.

Provincial Capitol Complex, Barangay Camilmil,
Calapan City 5200, Oriental Mindoro

(043) 288 7333
pa@ormindoro.gov.ph

For Corporation, Partnership, Association or a Consortium - capital must be at least sixty per centum (60%) owned by citizens of the Philippines with a minimum authorized capital stock of One Billion Pesos (P 1,000,000,000.00), twenty-five percent (25%) of which is subscribed and twenty-five percent (25%) of that subscribed is paid up. In no case shall the paid up capital be less than P250,000,000.00. For consortiums, one of its members must possess these qualifications.

4.Proof of Technical Capacity:

Only applicants capable of large-scale dredging activities for flood mitigation or prevention purposes in the heavily-silted river channels within the Province of Oriental Mindoro, based on their technical knowledge and verifiable previous track record conducting such activities, as properly vetted, duly certified and approved by the appropriate DENR and DPWH offices.

5. Pre-feasibility Study

6. List of Equipment

7.Verifiable list of previously completed or on-going river dredging contracts.

The aforementioned documentary requirements will only be accepted from **01 April 2023** to **15 April 2023** to the Inter-Agency Committee Secretariat, Ground Floor, Main Building, Provincial Capitol Complex, Barangay Camilmil, Calapan City, Oriental Mindoro. Kindly look for **MARK DANIEL M. NICASIO** and **MARIA AIZA D. LIBUDAN**, or contact the Secretariat at **(043) 441-1074**, or **0917-114-8017** for inquiries.

Please take note that the submitted documents shall be further subject to the review and approval of the Inter-Agency Committee, and in accordance with existing laws, rules and regulations.

DR. HUBBERT CHRISTOPHER A. DOLOR, MPA, MHA, PAR
Provincial Administrator
Chairperson, Technical Working Group and Financial Working Group for River Restoration and Dredging Activities in the Province of Oriental Mindoro

Annex 5: Provincial Government of Oriental Mindoro Certification Letter

Republic of the Philippines
PROVINCE OF ORIENTAL MINDORO

PROVINCIAL LEGAL OFFICE
Provincial Capitol Complex, Camilmil, Calapan City 5200, Oriental Mindoro
+63 43 286 7062/ 286 7558 +63 43 441 1074 plo@ormindoro.gov.ph

17 May 2023

MR. ALFREDO R. TOLENTINO, JR.
Chairperson and President
Bird's Nest Resources Corporation
Room 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am,
Quezon City

Dear **Mr. Tolentino:**

On 09 May 2023, during the the Inter-Agency Committee (IAC) on Rationalizing Dredging Activities in the Heavily-Silted River Channels within the Province of Oriental Mindoro meeting, Bird's Nest Resources Corporation (Bird's Nest) has been conferred the status as a pre-qualified proponent to undertake River Restoration through Large-Scale Dredging Activities in the Cluster of **Alag River** (Barangay Water, Baco, Oriental Mindoro), and **Longos River** (Barangay San Andres, Baco, Oriental Mindoro).

Furthermore, this is to certify that on the same date, the IAC authorized Bird's Nest to conduct public scoping and to submit the draft Dredging Master Plan within sixty (60) days thereof. Hence, the preliminary studies for the approval of the Dredging Master Plan and the application process for the issuance of the Environmental Compliance Certificate (ECC) may now commence in accordance with Department of Environment and Natural Resources Department Administrative Order (DAO) No. 14-2019.

Issued this 17th day of May, 2023.

Very truly yours,

ATTY. EARL LIGORIO R. TURANO II
Provincial Legal Officer
Secretariat for River Restoration and Dredging Activities
in the Province of Oriental Mindoro

Annex 6: Proof of Authority for the Site Office

DELROL CONSTRUCTION CORPORATION
Alag, Baco, Oriental Mindoro
+639950750667
Email Address: delrolconstructioncorporation@gmail.com

CERTIFICATION

This is to certify that Birds Nest Resources Corporation currently rents and occupies the Office Space located at the 2nd Floor of DelRol Building, Barangay Katwiran II, Baco, Oriental Mindoro. Said company has been renting the said office space since May 2023.

Issued this 27th day of July, 2023 in Poblacion, Baco, Oriental Mindoro for whatever legal purpose it may serve.

RENZ SERAPHIM D. ROLDAN
Operations Manager

Annex 7: Certificate of Land Use Compatibility

Republic of the Philippines
Province of Oriental Mindoro
MUNICIPALITY OF BACO
Municipal Planning and Development Office

CERTIFICATION

This is to certify that the proposed **River Restoration Project** through **Dredging and Rechanneling** activities is compatible with the **Comprehensive Land Use Plan (2018-2028) of the Municipality of Baco, Province of Oriental Mindoro.**

The allowed radius of dredging activity is one kilometer (1km.) away from the bridge as per directive of the DPWH.

This further certifies that the above mentioned CLUP is under the review process of Provincial Land Use Committee (PLUC).

This certification is issued upon request of **Bird's Nest Resources Corporation** in connection with its Environmental Compliance Certificate application as one of the requirements for the proposed River Restoration Project through Dredging activity on the stretch of Alag and Longos Rivers.

Issued this 17th day of July 2023 in the Municipality of Baco, Oriental Mindoro.

ROSENDO R. ARRIOLA JR.
Municipal Planning and Development Coordinator

NAGLILINGKOD SA BAYAN, PARA SA MAMAMAYAN

Annex 8: Laboratory Analysis Results

F.A.S.T. Laboratories
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B1 L2 P1 Ponte Verde de Sto. Tomas, Brgy. San Rafael, Sto. Tomas City, Batangas 4234
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Email: fastlabcalabarzon@gmail.com
Website: www.fastlaboratories.com.ph

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LA-2013-247C

TEAMWORK ● RESPECT ● INTEGRITY ● CUSTOMER SATISFACTION ● COMMITMENT TO EXCELLENCE ● SOCIAL RESPONSIBILITY

TEST REPORT

Reference No. CL2307-3783

CUSTOMER:	BIRD'S NEST RESOURCES CORP
ADDRESS:	146 West Ave., Quezon city
PROJECT NAME:	BACO RIVER RESTORATION PROS.
PROJECT ADDRESS:	BACO ORIENTAL MINDORO
SAMPLE(S) RECEIVED:	WATER FROM GW 1
SAMPLE CODE:	CL2307-3783-01
Date / Time of Sampling:	19 Jul 2023 / 08:10 AM (By Customer)
Date / Time Received:	19 Jul 2023 / 01:40 PM
Date Analyzed:	19 Jul 2023 to 24 Jul 2023
Analyzed by:	MNLIAbengoza / IDOlivares / JGGanar
Date Reported:	26 Jul 2023

Parameters	Unit	Results	Test Method
Biochemical Oxygen Demand	mg/L	Less than 2	5210 B. 5-DAY BOD Test
Oil and Grease	mg/L	2.84	5520 B. Liquid -Liquid Partition
Total Suspended Solids	mg/L	Less than 2.1*	2540 D. Gravimetric

* - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
26 Jul 2023
APRIL ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem. Reg. No. 13219

APPROVED BY:
26 Jul 2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem. Reg. No. 10116

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ACCREDITATIONS/RECOGNITIONS: Dept. of Environment and Natural Resources (DENR) • Dept. of Health (DOH) • Dept. of Agriculture - Bureau of Animal Industry (DA-BAI) Food and Drug Administration (FDA) •Bureau of Fisheries and Aquatic Resources (BFAR) • Laguna Lake Development Authority (LLDA

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Cebu – Hi-way Central Bldg., M. C. Briones Highway, Mandaue City, Cebu 6014 • Tels: (032)503-8272; Globe: (0955)301-9406 • E-mail: fastmandaue@yahoo.com
Cagayan de Oro – 2/F Casiño Bldg., C.M. Recto Ave., cor. Camp Alagar Rd., Brgy. Lapasan, Cagayan de Oro City, Misamis Oriental 9000 • Tels: (088)852-4846; (0917)625-3101 • fastlabcdo@gmail.com
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TEAMWORK ● RESPECT ● INTEGRITY ● CUSTOMER SATISFACTION ● COMMITMENT TO EXCELLENCE ● SOCIAL RESPONSIBILITY

TEST REPORT

Reference No. CL2307-3783

CUSTOMER:	BIRD'S NEST RESOURCES CORP
ADDRESS:	146 West Ave., Quezon city
PROJECT NAME:	BACO RIVER RESTORATION PROS.
PROJECT ADDRESS:	BACO ORIENTAL MINDORO
SAMPLE(S) RECEIVED:	WATER FROM GW 2
SAMPLE CODE:	CL2307-3783-02
Date / Time of Sampling:	19 Jul 2023 / 08:20 AM (By Customer)
Date / Time Received:	19 Jul 2023 / 01:40 PM
Date Analyzed:	19 Jul 2023 to 24 Jul 2023
Analyzed by:	MNLIAbengoza / IDOlivares / JGGanar
Date Reported:	26 Jul 2023

Parameters	Unit	Results	Test Method
Biochemical Oxygen Demand	mg/L	Less than 12	5210 B. 5-DAY BOD Test
Oil and Grease	mg/L	2.57	5520 B. Liquid -Liquid Partition
Total Suspended Solids	mg/L	23	2540 D. Gravimetric

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
26 Jul 2023
APRIL ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem. Reg. No. 13219

APPROVED BY:
26/7/2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem. Reg. No. 10116

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TEST REPORT

Reference No. CL2307-3783

CUSTOMER:	BIRD'S NEST RESOURCES CORP
ADDRESS:	146 West Ave., Quezon city
PROJECT NAME:	BACO RIVER RESTORATION PROS.
PROJECT ADDRESS:	BACO ORIENTAL MINDORO
SAMPLE(S) RECEIVED:	WATER FROM GW 3
SAMPLE CODE:	CL2307-3783-03
Date / Time of Sampling:	19 Jul 2023 / 08:05 AM (By Customer)
Date / Time Received:	19 Jul 2023 / 01:40 PM
Date Analyzed:	19 Jul 2023 to 24 Jul 2023
Analyzed by:	MNLIAbengoza / IDOlivares / JGGanar
Date Reported:	26 Jul 2023

Parameters	Unit	Results	Test Method
Biochemical Oxygen Demand	mg/L	Less than 12	5210 B. 5-DAY BOD Test
Oil and Grease	mg/L	1.35	5520 B. Liquid -Liquid Partition
Total Suspended Solids	mg/L	Less than 2.1*	2540 D. Gravimetric

* - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
26 Jul 2023
APRIL ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem. Reg. No. 13219

APPROVED BY:
26/Jul/2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem. Reg. No. 10116

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LA-2013-247C

TEAMWORK ● RESPECT ● INTEGRITY ● CUSTOMER SATISFACTION ● COMMITMENT TO EXCELLENCE ● SOCIAL RESPONSIBILITY

TEST REPORT

Reference No. CL2307-3783

CUSTOMER:	BIRD'S NEST RESOURCES CORP
ADDRESS:	146 West Ave., Quezon city
PROJECT NAME:	BACO RIVER RESTORATION PROS.
PROJECT ADDRESS:	BACO ORIENTAL MINDORO
SAMPLE(S) RECEIVED:	WATER FROM GW 4
SAMPLE CODE:	CL2307-3783-04
Date / Time of Sampling:	19 Jul 2023 / 08:21 AM (By Customer)
Date / Time Received:	19 Jul 2023 / 01:40 PM
Date Analyzed:	19 Jul 2023 to 24 Jul 2023
Analyzed by:	MNLIAbengoza / IDOlivares / JGGanar
Date Reported:	26 Jul 2023

Parameters	Unit	Results	Test Method
Biochemical Oxygen Demand	mg/L	Less than 12	5210 B. 5-DAY BOD Test
Oil and Grease	mg/L	Less than 0.70*	5520 B. Liquid -Liquid Partition
Total Suspended Solids	mg/L	4	2540 D. Gravimetric

* - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
26 Jul 2023
APRIL-ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem. Reg. No. 13219

APPROVED BY:
27 Jul 2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem. Reg. No. 10116

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TEST REPORT

Reference No. CL2307-3783

CUSTOMER:	BIRD'S NEST RESOURCES CORP
ADDRESS:	146 West Ave., Quezon city
PROJECT NAME:	BACO RIVER RESTORATION PROS.
PROJECT ADDRESS:	BACO ORIENTAL MINDORO
SAMPLE(S) RECEIVED:	WATER FROM GW 5
SAMPLE CODE:	CL2307-3783-05
Date / Time of Sampling:	19 Jul 2023 / 08:15 AM (By Customer)
Date / Time Received:	19 Jul 2023 / 01:40 PM
Date Analyzed:	19 Jul 2023 to 24 Jul 2023
Analyzed by:	MNLIAbengoza / IDOlivares / JGGanar
Date Reported:	26 Jul 2023

Parameters	Unit	Results	Test Method
Biochemical Oxygen Demand	mg/L	Less than 12	5210 B. 5-DAY BOD Test
Oil and Grease	mg/L	0.79	5520 B. Liquid -Liquid Partition
Total Suspended Solids	mg/L	Less than 2.1*	2540 D. Gravimetric

* - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
26 Jul 2023
APRIL-ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem. Reg. No. 13219

APPROVED BY:
26/7/2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem. Reg. No. 10116

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TEST REPORT

Reference No. CL2307-3783

CUSTOMER:	BIRD'S NEST RESOURCES CORP
ADDRESS:	146 West Ave., Quezon city
PROJECT NAME:	BACO RIVER RESTORATION PROS.
PROJECT ADDRESS:	BACO ORIENTAL MINDORO
SAMPLE(S) RECEIVED:	WATER FROM GW 6
SAMPLE CODE:	CL2307-3783-06
Date / Time of Sampling:	19 Jul 2023 / 08:35 AM (By Customer)
Date / Time Received:	19 Jul 2023 / 01:40 PM
Date Analyzed:	19 Jul 2023 to 24 Jul 2023
Analyzed by:	MNLIAbengoza / IDOlivares / JGGanar
Date Reported:	26 Jul 2023

Parameters	Unit	Results	Test Method
Biochemical Oxygen Demand	mg/L	Less than 12	5210 B. 5-DAY BOD Test
Oil and Grease	mg/L	1.51	5520 B. Liquid -Liquid Partition
Total Suspended Solids	mg/L	Less than 2.1*	2540 D. Gravimetric

* - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
26 Jul 2023
APRIL-ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem. Reg. No. 13219

APPROVED BY:
26 Jul 2023
DENNIS R. SIBONGGA, RCh
Laboratory Business Manager
Chem. Reg. No. 10116

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TEST REPORT

Reference No. **CL2307-3784**

CUSTOMER	: BIRD'S NEST RESOURCES CORP
ADDRESS	: 146 West Ave., Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJ.
PROJECT ADDRESS	: Baco, Oriental Mindoro
SAMPLE(S) RECEIVED	: GROUND WATER #1 (As Received)
SAMPLE CODE	: CL2307-3784-01
Date / Time of Sampling	: 19 July 2023 / 08:10 AM
Sampled By	: Customer
Date / Time Received	: 19 July 2023 / 01:40 PM
Date / Time Analyzed	: 19 July 2023 / 04:00 PM
Analyzed By	: Ayah L. Berdin
Date Reported	: 28 July 2023

PARAMETER	UNIT	RESULT	TEST METHOD
Fecal Coliform	MPN per 100mL	45	**Multiple Tube Fermentation Technique (9221 B-C)**

Note: MPN - Most Probable Number

Ref.: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
28/07/2023
LIEZL C. RAFER
Laboratory Microbiologist

NOTED BY:
28/07/2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem.Reg.No.10116

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TEST REPORT

Reference No. **CL2307-3784**

CUSTOMER	: BIRD'S NEST RESOURCES CORP
ADDRESS	: 146 West Ave., Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJ.
PROJECT ADDRESS	: Baco, Oriental Mindoro
SAMPLE(S) RECEIVED	: GROUND WATER #2 (As Received)
SAMPLE CODE	: CL2307-3784-02
Date / Time of Sampling	: 19 July 2023 / 08:20 AM
Sampled By	: Customer
Date / Time Received	: 19 July 2023 / 01:40 PM
Date / Time Analyzed	: 19 July 2023 / 04:00 PM
Analyzed By	: Ayah L. Berdin
Date Reported	: 28 July 2023

PARAMETER	UNIT	RESULT	TEST METHOD
Fecal Coliform	MPN per 100mL	Less than 18	**Multiple Tube Fermentation Technique (9221 B-C)**

Note: MPN - Most Probable Number

Ref.: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
28/Jul/2023
LIEZL C. RAFER
Laboratory Microbiologist

NOTED BY:
28Jul2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem.Reg.No.10116

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TEST REPORT

Reference No. **CL2307-3784**

CUSTOMER	: BIRD'S NEST RESOURCES CORP
ADDRESS	: 146 West Ave., Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJ.
PROJECT ADDRESS	: Baco, Oriental Mindoro
SAMPLE(S) RECEIVED	: GROUND WATER #3 (As Received)
SAMPLE CODE	: CL2307-3784-03
Date / Time of Sampling	: 19 July 2023 / 08:05 AM
Sampled By	: Customer
Date / Time Received	: 19 July 2023 / 01:40 PM
Date / Time Analyzed	: 19 July 2023 / 04:00 PM
Analyzed By	: Ayah L. Berdin
Date Reported	: 28 July 2023

PARAMETER	UNIT	RESULT	TEST METHOD
Fecal Coliform	MPN per 100mL	Less than 18	**Multiple Tube Fermentation Technique (9221 B-C)**

Note: MPN - Most Probable Number

Ref.: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
28/07/2023
LIEZL C. RAFER
Laboratory Microbiologist

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TEST REPORT

Reference No. **CL2307-3784**

CUSTOMER	: BIRD'S NEST RESOURCES CORP
ADDRESS	: 146 West Ave., Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJ.
PROJECT ADDRESS	: Baco, Oriental Mindoro
SAMPLE(S) RECEIVED	: GROUND WATER #4 (As Received)
SAMPLE CODE	: CL2307-3784-04
Date / Time of Sampling	: 19 July 2023 / 08:21 AM
Sampled By	: Customer
Date / Time Received	: 19 July 2023 / 01:40 PM
Date / Time Analyzed	: 19 July 2023 / 04:00 PM
Analyzed By	: Ayah L. Berdin
Date Reported	: 28 July 2023

PARAMETER	UNIT	RESULT	TEST METHOD
Fecal Coliform	MPN per 100mL	45	**Multiple Tube Fermentation Technique (9221 B-C)**

Note: MPN - Most Probable Number

Ref.: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

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28/Jul/2023
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TEST REPORT

Reference No. **CL2307-3784**

CUSTOMER	: BIRD'S NEST RESOURCES CORP
ADDRESS	: 146 West Ave., Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJ.
PROJECT ADDRESS	: Baco, Oriental Mindoro
SAMPLE(S) RECEIVED	: GROUND WATER #5 (As Received)
SAMPLE CODE	: CL2307-3784-05
Date / Time of Sampling	: 19 July 2023 / 08:15 AM
Sampled By	: Customer
Date / Time Received	: 19 July 2023 / 01:40 PM
Date / Time Analyzed	: 19 July 2023 / 04:00 PM
Analyzed By	: Ayah L. Berdin
Date Reported	: 28 July 2023

PARAMETER	UNIT	RESULT	TEST METHOD
Fecal Coliform	MPN per 100mL	Less than 18	**Multiple Tube Fermentation Technique (9221 B-C)**

Note: MPN - Most Probable Number

Ref.: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

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CERTIFIED BY:

28/Jul/2023

LIEZL C. RAFER
Laboratory Microbiologist

NOTED BY:

28.Jul.2023

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Laboratory Business Manager
Chem.Reg.No.10116

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F.A.S.T. Laboratories
The First Analytical Services And Technical Cooperative
B1 L2 P1 Ponte Verde de Sto. Tomas, Brgy. San Rafael, Sto. Tomas City, Batangas 4234
Tel.: (043)723-0424; Globe: (0917)523-4365
Email: fastlabcalabarzon@gmail.com
Website: www.fastlaboratories.com.ph

PAB ACCREDITED
TESTING LABORATORY
PNS ISO/IEC 17025:2017
LA-2016-303B

TEAMWORK ● RESPECT ● INTEGRITY ● CUSTOMER SATISFACTION ● COMMITMENT TO EXCELLENCE ● SOCIAL RESPONSIBILITY

TEST REPORT

Reference No. **CL2307-3784**

CUSTOMER	: BIRD'S NEST RESOURCES CORP
ADDRESS	: 146 West Ave., Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJ.
PROJECT ADDRESS	: Baco, Oriental Mindoro
SAMPLE(S) RECEIVED	: GROUND WATER #6 (As Received)
SAMPLE CODE	: CL2307-3784-06
Date / Time of Sampling	: 19 July 2023 / 08:35 AM
Sampled By	: Customer
Date / Time Received	: 19 July 2023 / 01:40 PM
Date / Time Analyzed	: 19 July 2023 / 04:00 PM
Analyzed By	: Ayah L. Berdin
Date Reported	: 28 July 2023

PARAMETER	UNIT	RESULT	TEST METHOD
Fecal Coliform	MPN per 100mL	Less than 18	**Multiple Tube Fermentation Technique (9221 B-C)**

Note: MPN - Most Probable Number

Ref.: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
28/Jul/2023
LIEZL C. RAFER
Laboratory Microbiologist

NOTED BY:
28/7/2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem.Reg.No.10116

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***F.A.S.T. Laboratories*–CALABARZON**
Blk. 1, Lot 2, Phase 1, Ponte Verde de Sto Tomas, Brgy. San Rafael, Sto Tomas, Batangas

TEST REPORT

Reference No. **CL2306-2889**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
ADDRESS	: Baco, Oriental Mindoro
SAMPLE(S) RECEIVED	: FRESH WATER SAMPLES (As Received)
SAMPLE CODE	: CL2306-2889-01 to 02
Date / Time of Sampling	: 19 June 2023 / 09:10 AM to 09:40 AM
Sampled By	: Customer
Date / Time Received	: 19 June 2023 / 03:20 PM
Date / Time Analyzed	: 19 June 2023 / 04:04 PM
Analyzed By	: Ayah L. Berdin
Date Reported	: 27 June 2023

SAMPLES	Fecal Coliform Count (MPN per 100mL)
FW1	94×10^2
FW2	13×10^2
FW3	17×10^2
FW4	33×10^2
FW5	33×10^2
FW6	14×10^3
Test Method	**Multiple Tube Fermentation Technique (9221 B-C)**

Note: MPN = Most Probable Number

Ref.: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
27/Jun/2023
LIEZL C. RAFER
Laboratory Microbiologist

NOTED BY:
for 27/Jun/2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem.Reg.No.10116

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F.A.S.T. Laboratories **– Calabarzon**
B1 L2 P1, Ponte Verde de Sto. Tomas, San Rafael, Sto. Tomas, Batangas

TEST REPORT

Reference No. **CL2306-2890**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
PROJECT ADDRESS	: Baco, Oriental, Mindoro
SAMPLE /S RECEIVED	: WATER
SAMPLING LOCATION	: FW1
SAMPLE CODE	: CL2306-2890-01
Date / Time of Sampling	: 19 Jun 2023 / 09:21 AM
Sampled By	: By Customer
Date / Time Received	: 19 Jun 2023 / 03:20 PM
Date Analyzed	: 19 Jun 2023 to 05 Jul 2023
Date Reported	: 10 Jul 2023

Parameter	Unit	Result	Test Method
Total Suspended Solids	mg/L	11	2540 D. Gravimetric
Total Dissolved Solids[a]	mg/L	66	2540 C. Gravimetric
Oil and Grease	mg/L	Less than 0.70*	5520 B. Liquid -Liquid Partition
Biochemical Oxygen Demand	mg/L	10	5210 B. 5-DAY BOD Test
Lead	mg/L	Less than 0.005*	3030 E. Nitric Acid Digestion AAS

Note: * - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed

Results are those obtained at the time of examination and relate only to the sample/s tested.

CERTIFIED BY:

10 Jul 2023
APRIL-ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem. Reg. No. 13219

APPROVED BY:

10/7/2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem. Reg. No. 10116

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B1 L2 P1, Ponte Verde de Sto. Tomas, San Rafael, Sto. Tomas, Batangas

TEST REPORT

Reference No. **CL2306-2890**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
PROJECT ADDRESS	: Baco, Oriental, Mindoro
SAMPLE /S RECEIVED	: WATER
SAMPLING LOCATION	: FW2
SAMPLE CODE	: CL2306-2890-02
Date / Time of Sampling	: 19 Jun 2023 / 09:10 AM
Sampled By	: By Customer
Date / Time Received	: 19 Jun 2023 / 03:20 PM
Date Analyzed	: 19 Jun 2023 to 05 Jul 2023
Date Reported	: 10 Jul 2023

Parameter	Unit	Result	Test Method
Total Suspended Solids	mg/L	12	2540 D. Gravimetric
Total Dissolved Solids[a]	mg/L	130	2540 C. Gravimetric
Oil and Grease	mg/L	Less than 0.70*	5520 B. Liquid -Liquid Partition
Biochemical Oxygen Demand	mg/L	Less than 4	5210 B. 5-DAY BOD Test
Lead	mg/L	Less than 0.005*	3030 E. Nitric Acid Digestion AAS

Note: * - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed

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10 Jul 2023

APRIL-ROSS B. ESPINA, RCh
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TEST REPORT

Reference No. **CL2306-2890**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
PROJECT ADDRESS	: Baco, Oriental, Mindoro
SAMPLE /S RECEIVED	: WATER
SAMPLING LOCATION	: FW3
SAMPLE CODE	: CL2306-2890-03
Date / Time of Sampling	: 19 Jun 2023 / 09:23 AM
Sampled By	: By Customer
Date / Time Received	: 19 Jun 2023 / 03:20 PM
Date Analyzed	: 19 Jun 2023 to 05 Jul 2023
Date Reported	: 10 Jul 2023

Parameter	Unit	Result	Test Method
Total Suspended Solids	mg/L	5	2540 D. Gravimetric
Total Dissolved Solids[a]	mg/L	166	2540 C. Gravimetric
Oil and Grease	mg/L	Less than 0.70*	5520 B. Liquid -Liquid Partition
Biochemical Oxygen Demand	mg/L	Less than 4	5210 B. 5-DAY BOD Test
Lead	mg/L	Less than 0.005*	3030 E. Nitric Acid Digestion AAS

Note: * - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed

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10 Jul 2023
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TEST REPORT

Reference No. **CL2306-2890**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
PROJECT ADDRESS	: Baco, Oriental, Mindoro
SAMPLE /S RECEIVED	: WATER
SAMPLING LOCATION	: FW4
SAMPLE CODE	: CL2306-2890-04
Date / Time of Sampling	: 19 Jun 2023 / 09:30 AM
Sampled By	: By Customer
Date / Time Received	: 19 Jun 2023 / 03:20 PM
Date Analyzed	: 19 Jun 2023 to 05 Jul 2023
Date Reported	: 10 Jul 2023

Parameter	Unit	Result	Test Method
Total Suspended Solids	mg/L	5	2540 D. Gravimetric
Total Dissolved Solids[a]	mg/L	176	2540 C. Gravimetric
Oil and Grease	mg/L	Less than 0.70*	5520 B. Liquid -Liquid Partition
Biochemical Oxygen Demand	mg/L	Less than 4	5210 B. 5-DAY BOD Test
Lead	mg/L	Less than 0.005*	3030 E. Nitric Acid Digestion AAS

Note: * - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed

Results are those obtained at the time of examination and relate only to the sample/s tested.

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10 Jul 2023

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Chem. Reg. No. 13219

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MAIN: 62, 20th Avenue, Cubao, Quezon City, 1109 • Tels. (02)8913-0240 • 8912-6319 • 8913-8848 • Globe (0917)523-4178 • www.fastlaboratories.com.ph • info.fastlaboratories.com
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Cebu – Hi-way Central Bldg., M. C. Briones Highway, Mandaue City, Cebu 6014 • Tels. (032)503-8272; Globe. (0955)301-9406 • E-mail: fastmandaue@gmail.com
Cagayan de Oro – 2/F Casiño Bldg., C.M. Recto Ave., cor. Camp Alagar Rd., Brgy. Lapasan, Cagayan de Oro City, Misamis Oriental 9000 • Tels. (088)852-4846, (0917)625-3101 • fastlabodo@gmail.com
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***F.A.S.T. Laboratories* – Calabarzon**
B1 L2 P1, Ponte Verde de Sto. Tomas, San Rafael, Sto. Tomas, Batangas

TEST REPORT

Reference No. **CL2306-2890**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
PROJECT ADDRESS	: Baco, Oriental, Mindoro
SAMPLE /S RECEIVED	: WATER
SAMPLING LOCATION	: FW5
SAMPLE CODE	: CL2306-2890-05
Date / Time of Sampling	: 19 Jun 2023 / 09:40 AM
Sampled By	: By Customer
Date / Time Received	: 19 Jun 2023 / 03:20 PM
Date Analyzed	: 19 Jun 2023 to 05 Jul 2023
Date Reported	: 10 Jul 2023

Parameter	Unit	Result	Test Method
Total Suspended Solids	mg/L	6	2540 D. Gravimetric
Total Dissolved Solids[a]	mg/L	82	2540 C. Gravimetric
Oil and Grease	mg/L	Less than 0.70*	5520 B. Liquid -Liquid Partition
Biochemical Oxygen Demand	mg/L	Less than 4	5210 B. 5-DAY BOD Test
Lead	mg/L	Less than 0.005*	3030 E. Nitric Acid Digestion AAS

Note: * - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed

Results are those obtained at the time of examination and relate only to the sample/s tested.

CERTIFIED BY:

10 Jul 2023

APRIL-ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem. Reg. No. 13219

APPROVED BY:

10 Jul 2023

DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem. Reg. No. 10116

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***F.A.S.T. Laboratories* – Calabarzon**
B1 L2 P1, Ponte Verde de Sto. Tomas, San Rafael, Sto. Tomas, Batangas

TEST REPORT

Reference No. **CL2306-2890**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
PROJECT ADDRESS	: Baco, Oriental, Mindoro
SAMPLE /S RECEIVED	: WATER
SAMPLING LOCATION	: FW6
SAMPLE CODE	: CL2306-2890-06
Date / Time of Sampling	: 19 Jun 2023 / 09:15 AM
Sampled By	: By Customer
Date / Time Received	: 19 Jun 2023 / 03:20 PM
Date Analyzed	: 19 Jun 2023 to 05 Jul 2023
Date Reported	: 10 Jul 2023

Parameter	Unit	Result	Test Method
Total Suspended Solids	mg/L	6	2540 D. Gravimetric
Total Dissolved Solids[a]	mg/L	46	2540 C. Gravimetric
Oil and Grease	mg/L	Less than 0.70*	5520 B. Liquid -Liquid Partition
Biochemical Oxygen Demand	mg/L	Less than 4	5210 B. 5-DAY BOD Test
Lead	mg/L	Less than 0.005*	3030 E. Nitric Acid Digestion AAS

Note: * - Method Detection Limit

Reference: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed

Results are those obtained at the time of examination and relate only to the sample/s tested.

CERTIFIED BY:

APRIL-ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem. Reg. No. 13219

APPROVED BY:

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***F.A.S.T. Laboratories*–CALABARZON**
Blk. 1, Lot 2, Phase 1, Ponte Verde de Sto Tomas, Brgy. San Rafael, Sto Tomas, Batangas

TEST REPORT

Reference No.**CL2306-2888**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
ADDRESS	: Baco, Oriental Mindoro
SAMPLE(S) RECEIVED	: MARINE WATER SAMPLES (As Received)
SAMPLE CODE	: CL2306-2888-01 to 02
Date / Time of Sampling	: 19 June 2023 / 09:00 AM to 09:10 AM
Sampled By	: Customer
Date / Time Received	: 19 June 2023 / 03:20 PM
Date / Time Analyzed	: 19 June 2023 / 04:04 PM
Analyzed By	: Ayah L. Berdin
Date Reported	: 27 June 2023

SAMPLES	Fecal Coliform Count (MPN per 100mL)
MW1	Less than 18
MW2	13×10^2
MW3	130
Test Method	**Multiple Tube Fermentation Technique (9221 B-C)**

Note: MPN = Most Probable Number

Ref.: APHA-AWWA and WEF 2017. Standard Methods for the Examination of Water and Wastewater, 23rd ed.

Results are those obtained at time of examination and relate only to the sample/s tested.

CERTIFIED BY:
27Jun2023
LIEZL C. RAFER
Laboratory Microbiologist

NOTED BY:
for 27Jun2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem.Reg.No.10116

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ACCREDITATIONS/RECOGNITIONS: Dept. of Environment and Natural Resources (DENR) • Dept. of Health (DOH) • Dept. of Agriculture - Bureau of Animal Industry (DA-BAI) Food and Drug Administration (FDA) •Bureau of Fisheries and Aquatic Resources (BFAR) • Laguna Lake Development Authority (LLDA)

MAIN: 62, 20th Avenue, Cubao, Quezon City, 1109 • Tels. (02)8913-0240 • 8912-5319 • 8913-8848 • Globe (0917)523-4178 • www.fastlaboratories.com.ph • info.fastlaboratories.com
BRANCHES ***Calabarzon*** – B1 L2 P1 Ponte Verde de Sto. Tomas, Brgy. San Rafael, Sto. Tomas City, Batangas 4234 • Tels. (043)723-0424, Globe: (0917)523-4365, • fastlabcalabarzon@gmail.com
Cebu – Hi-way Central Bldg., M.C. Briones Highway, Mandaue City, Cebu 6014 • Tels. (032)503-8272, Globe: (0955)301-9406 • E-mail: fastmandaue@gmail.com
Cagayan de Oro – 2/F Casiño Bldg., C.M. Recto Ave., cor. Camp Alagar Rd., Brgy. Lapasan, Cagayan de Oro City, Misamis Oriental 9000 • Tels. (088)852-4846, (0917)625-3101 • fastlabodo@gmail.com
Clark – Angeles – Stall 5 & 7, SNB Bldg., 717 Magalang Road, Pandan, Angeles City 2009 • Tels. (045)457-0517 • Smart: (0918)908-3517 • fastlabclark@gmail.com

F.A.S.T. Laboratories
The First Analytical Services And Technical Cooperative

TEAMWORK●RESPECT●INTEGRITY●CUSTOMER SATISFACTION●COMMITMENT TO EXCELLENCE●SOCIAL RESPONSIBILITY

***F.A.S.T. Laboratories* – Calabarzon**
B1 L2 P1, Ponte Verde de Sto. Tomas, San Rafael, Sto. Tomas, Batangas

TEST REPORT

Reference No. **CL2306-2887**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
PROJECT ADDRESS	: Baco, Oriental, Mindoro
SAMPLE /S RECEIVED	: WATER FROM MW1 6/19
SAMPLE CODE	: CL2306-2887-01
Date / Time of Sampling	: 19 Jun 2023 / 09:00 AM (By Customer)
Date / Time Received	: 19 Jun 2023 / 03:20 PM
Date Analyzed	: 19 Jun 2023 to 05 Jul 2023
Analyzed By	: MNLIAbengoza / KGData / JVMayono / IDOlivares
Date Reported	: 06 Jul 2023

Parameter	Unit	Result	Test Method
Total Suspended Solids	mg/L	36	2540 D. Gravimetric
Total Dissolved Solids	mg/L	34652	2540 C. Gravimetric
Chemical Oxygen Demand$^{\beta}$	mg/L	189	Open Reflux Method (SM 5220 B)
Oil and Grease	mg/L	Less than 0.70*	5520 B. Liquid -Liquid Partition

Note: $^{\beta}$ - Outsourced to *F.A.S.T. Laboratories* recognized external provider; * - Method Detection Limit

Reference: Standard Methods for the Examination of Water and Wastewater, APHA-AWWA and WEF, 23rd Edition.

Results are those obtained at the time of examination and relate only to the sample/s tested.

CERTIFIED BY:
06 Jul 2023
APRIL-ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem.Reg.No.13219

APPROVED BY:
06/07/2023
DENNIS B. SIBONGGA, RCh
Laboratory Business Manager
Chem.Reg.No.10116

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TEST REPORT

Reference No. **CL2306-2887**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
PROJECT ADDRESS	: Baco, Oriental, Mindoro
SAMPLE /S RECEIVED	: WATER FROM MW2 6/19
SAMPLE CODE	: CL2306-2887-02
Date / Time of Sampling	: 19 Jun 2023 / 09:00 AM (By Customer)
Date / Time Received	: 19 Jun 2023 / 03:20 PM
Date Analyzed	: 19 Jun 2023 to 05 Jul 2023
Analyzed By	: MNLIAbengoza / KGData / JVMayono / IDOlivares
Date Reported	: 06 Jul 2023

Parameter	Unit	Result	Test Method
Total Suspended Solids	mg/L	43	2540 D. Gravimetric
Total Dissolved Solids	mg/L	12386	2540 C. Gravimetric
Chemical Oxygen Demand$^{\beta}$	mg/L	365	Open Reflux Method (SM 5220 B)
Oil and Grease	mg/L	Less than 0.70*	5520 B. Liquid -Liquid Partition

Note: $^{\beta}$ - Outsourced to *F.A.S.T. Laboratories* recognized external provider; * - Method Detection Limit

Reference: Standard Methods for the Examination of Water and Wastewater, APHA-AWWA and WEF, 23rd Edition.

Results are those obtained at the time of examination and relate only to the sample/s tested.

CERTIFIED BY:
06 Jul 2023
APRIL-ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem.Reg.No.13219

APPROVED BY:
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
Chem.Reg.No.10116

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***F.A.S.T. Laboratories* – Calabarzon**
B1 L2 P1, Ponte Verde de Sto. Tomas, San Rafael, Sto. Tomas, Batangas

TEST REPORT

Reference No. **CL2306-2887**

CUSTOMER	: BIRD'S NEST RESOURCES CORPORATION
ADDRESS	: 402 Bencom Bldg., 146 West Avenue, Brgy. Phil-Am, Quezon City
PROJECT NAME	: BACO RIVER RESTORATION PROJECT
PROJECT ADDRESS	: Baco, Oriental, Mindoro
SAMPLE /S RECEIVED	: WATER FROM MW3 6/19
SAMPLE CODE	: CL2306-2887-03
Date / Time of Sampling	: 19 Jun 2023 / 09:10 AM (By Customer)
Date / Time Received	: 19 Jun 2023 / 03:20 PM
Date Analyzed	: 19 Jun 2023 to 05 Jul 2023
Analyzed By	: MNLIAbengoza / KGData / JVMayono / IDOlivares
Date Reported	: 06 Jul 2023

Parameter	Unit	Result	Test Method
Total Suspended Solids	mg/L	29	2540 D. Gravimetric
Total Dissolved Solids	mg/L	32621	2540 C. Gravimetric
Chemical Oxygen Demand$^{\beta}$	mg/L	326	Open Reflux Method (SM 5220 B)
Oil and Grease	mg/L	Less than 0.70*	5520 B. Liquid -Liquid Partition

Note: $^{\beta}$ - Outsourced to *F.A.S.T. Laboratories* recognized external provider; * - Method Detection Limit

Reference: Standard Methods for the Examination of Water and Wastewater, APHA-AWWA and WEF, 23rd Edition.

Results are those obtained at the time of examination and relate only to the sample/s tested.

CERTIFIED BY:
06 Jul 2023
APRIL ROSS B. ESPINA, RCh
Laboratory Supervisor
Chem.Reg.No.13219

APPROVED BY:
06 Jul 2023
DENNIS P. SIBONGGA, RCh
Laboratory Business Manager
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4. **This report is not official and valid unless stamped with the seal of F. A. S. T. Laboratories. It shall be kept on file for six (6) months from the date of issue.**

Annex 9: Accountability Statements of Preparers and Proponent

SWORN STATEMENT OF ACCOUNTABILITY OF THE PROPONENT

This is to certify that all the information and commitments in this **Environmental Impact Assessment Report (EIAR)** for the **Proposed RIVER RESTORATION PROJECT THROUGH DREDGING ACTIVITIES CLUSTER OF ALAG AND LONGOS RIVERS** are accurate and complete to the best of our knowledge, and that an objective and thorough assessment of the Project was undertaken in accordance with the dictates of professional and reasonable judgment. Should I/we learn of any information which would make this **EIAR** inaccurate, I shall immediately bring the said information to the attention of DENR-EMB Regional Office.

I hereby certify that no DENR-EMB personnel were directly involved in the preparation of this **EIAR** other than to provide procedural and technical advice consistent with the guidelines in the DAO 03-30 Revised Procedural Manual.

I hereby bind myself to answer any penalty that may be imposed arising from any misrepresentation or failure to state material information in this **EIAR.**

In witness whereof, I hereby set my hand this ____ day of AUG 04 2023 at Pasig City.

ALFREDO R. TOLENTINO, JR.
Chairperson and President
Bird's Nest Resources Corporation

SUBSCRIBED AND SWORN TO before me this _____ day of AUG 04 2023 Pasig City 20__, affiant exhibiting his/her Community Tax Certificate No. SSS 33-1060083-8 issued at D. C. on 2/21/70.

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Page No. 79
Book No. XXVI
Series of 2023

ATTY. JOSELITO B. CONSTANTINO
NOTARY PUBLIC
Cities of Pasig, San Juan and in the Municipality of Pateros, Metro Manila
PTR No.0139418 / 01-03-2023
IBP No.259629 / 12-19-2022
MCLE No. VII-0019927 valid until April 14, 2025
S. C. Roll No.31102 / 05-04-1981
TIN No. 232-590-023-000
G/F Pasig City Hall Brgy. San Nicolas Pasig City
Appointment No.132 (2023-2024)
Contact No. 09273112426 / 09499240131

SWORN STATEMENT OF ACCOUNTABILITY OF THE PREPARERS

This is to certify that all information and commitments in this **Environmental Impact Assessment Report (EIAR)** for the **Proposed RIVER RESTORATION PROJECT THROUGH DREDGING ACTIVITY CLUSTER OF ALAG AND LONGOS RIVERS** are accurate and complete to the best of our knowledge, and that an objective and thorough assessment of the Project was undertaken in accordance with the dictates of professional and reasonable judgment. Should we learn of any information, which makes this **EIAR** inaccurate, we shall bring the said information to the attention of DENR-EMB.

We hereby certify that no DENR-EMB personnel was directly involved in the preparation of this **EIAR** other than to provide procedural and technical advice consistent with the guidelines in the DAO 03-30 Revised Procedural Manual.

We hereby bind ourselves jointly and solidarily to answer any penalty that may be imposed arising from any misrepresentation or failure to state material information in this **EIAR**.

In witness whereof, we hereby set our hands this ___ day of _____ 2023 at _____.

Name	Module/Specialization	Signature
Rainier D. Reyes	Peer Reviewer, Water Quality	
Mark Anthony E. Abrenica	Socio-Cultural, Economic and Political Environment	
Yves Christian L. Cabillon	Plankton Specialist and Team Leader	
Laurence Robles	Marine Ecology Specialist	
Jan Paolo T. Pollisco	Terrestrial Flora and Fauna Freshwater Ecology	

SUBSCRIBED AND SWORN to before me this ___ day of AUG 0 9 2023 2023 at QUEZON CITY, Affiants exhibiting to me their Tax Identification Number, as follows:

Name	TIN
Rainier D. Reyes	230-976-537
Mark Anthony E. Abrenica	330-190-505
Yves Christian L. Cabillon	422-309-663
Laurence Robles	422-801-567
Jan Paolo T. Pollisco	251-405-943

Notary Public

ATTY. CONCEPCION P. VILLAREÑA
Notary Public for Quezon City
Until December 31, 2023
PTR No. 3716371 / January 3, 2023 Q.C
IBP No. 167803 / November 25, 2021 Q.C
Roll No. 30457 / 05-09-1980
MCLE VII-0006994 / 09-21-2021
ADM. MATTER No. NP-005 (2022-2023)
TIN NO. 131-942-754

Doc. No. 212
Page No. 49
Book No. 98
Series of 2023

Annex 10: Project Environmental Monitoring and Audit Prioritization Scheme

Project Environmental Monitoring and Audit Prioritization Scheme (PEMAPS) Questionnaire

Project Name	:	River Restoration Project through Dredging Activities in the Cluster of Alag and Longos Rivers
Project Location	:	Barangays Water, San Andres, Lumangbayan, Pulang Tubig, Putican Cabulo, Tabon-Tabon, Malapad, Sta. Cruz, Burburi, Catwiran I, Catwiran II, Alag, Poblacion, Santa Rosa I, Municipality of Baco, Oriental Mindoro
ECC Reference No.	:	
Proponent	:	Bird's Nest Resources Corporation
Pollution Control Officer	:	
Tel. No./Fax/Email	:	0908-2961267
Project Type	:	River Restoration through Large-Scale Dredging
Project Status	:	New Project

1 PROJECT CONSIDERATIONS

1.1 Size and Type

1.1.1 Size based on number of employees

Specify number of employees: 10

1.1.2 Type

ECP (in either ECA of Non-ECA):

Non-ECP but in ECA: √

Non-ECP and in Non-ECA:

1.2 Waste Generation and Management

1.2.1 Enumerate Waste Type and Specify Quantity of Wastes generated in your facility. (Identify/Enumerate)

Category	Waste	Type		Quantity per year
		Hazardous	Non-Hazardous	
Air	None			
Liquid	None			
Solid	Office waste		√	

1.3 Pollution Control System (PCS)

1.3.1 Enumerate PCS or Waste Management Method used in your facility. (Identify/Enumerate)

Category	PCS/Waste Management Method Used	Remarks
Air		

Liquid		
Solid		

2 PATHWAYS

2.1 Prevailing wind towards barrio or city? (mark the corresponding point) Yes _√_ No ___

2.2 Rainfall (impacts surface and groundwater pathways)

2.2.1 Average annual net rainfall:
Specify amount: 2408.30 mm

2.2.2 Maximum 24-hour rainfall:
Specify amount: 277.4 mm

2.3 Terrain (select one and mark) Flat _√_ Steep ____

2.4 Is the facility located in a flood-prone area? (select one and mark) Yes ___ No _√___

2.5 Groundwater

Depth of groundwater table (meter):	(select one and mark)
0 to less than 3	√
3 to 10	
Greater than 10	

3 RECEIVING MEDIA/RECEPTORS

3.1 Air (Distance to nearest community)	(select one and mark)
0 to less than 0.5 km	√
0.5 to 1 km	
Greater than 1 km	

3.2 Receiving Surface Water Body

3.2.1 Distance to receiving surface water:	(select one and mark)
0 to less than 0.5 km	√
0.5 to 1 km	
Greater than 1 km	

3.2.2 Size of population receiving surface water
Specify number: None

3.2.3 Freshwater

3.2.3.1 Classification of freshwater:	(select one and mark)
AA	
A	
B	
C	√

D _____

3.2.3.2 Size of freshwater body

Specify size: 10 km

3.2.3.3 Economic value of water use (may select more than one)

Drinking	
Domestic	√
Recreational	√
Fishery	√
Industrial	
Agricultural	√

3.2.4 Salt Water

3.2.4.1 Classification of salt water: (select one and mark)

SA	
SB	
SC	√
SD	

3.2.4.2 Economic value of water use (may select more than one)

Fishery	√
Tourist zone or park	
Recreational	
Industrial	

3.3 Groundwater

3.3.1 Distance to nearest recharge area (select one and mark)

0 to less than 0.5 km	
0.5 to 1 km	
Greater than 1 km	√

3.3.2 Distance to nearest well used (select one and mark)

0 to less than 0.5 km	
0.5 to 1 km	√
Greater than 1 km	

3.3.3 Groundwater use within the nearest well (may select more than one)

Drinking	√
Industrial	
Agricultural	√

3.4 Land

3.4.1 Indicate current land uses within 0.5 km radius (may select more than one)

Residential	√
Commercial/Institutional	√
Industrial	
Agricultural/Recreational	√
Protected Area	

3.4.2 Potential/proposed land uses within 0.5 km (may select more than one)

Residential _____
Commercial/Institutional _____
Industrial _____
Agricultural/Recreational _____
Protected Area _____

3.4.3 Number of affected Environmentally Critical Areas within 1 km radius

Specify number: 4

3.4.4 Distance to nearest ECA (select one and mark)

0 to less than 0.5 km √
0.5 to 1 km _____
Greater than 1 km _____

4 ENVIRONMENTAL PERFORMANCE

4.1 Compliance (please take note that this will be double-checked with PCD files)

Law	Violation (check, if any)	Type (please specify number of times committed)				Type of Admin Violation	Additional Remarks/Status of Compliance
		Standard					
		Emission/Effluent/Discharge	Ambient	Human Impact	Admin/ ECC		
RA 8749		NA					
RA 9275							
RA 6969							
PD 1586							
RA 9003							

4.2 Number of Valid Complaints

4.2.1 Citizens and NGOs

Specify number: None

4.2.2 Others (other government agencies, private institutions)

Specify number: None

(To be filled up by EMB Personnel)

RECOMMENDATION/S:

_____
_____
_____
_____

Assessed by: _____

Noted by: _____

ACCOUNTABILITY STATEMENT OF PROJECT PROPONENT

This is to certify that all information in the submitted **Project Environmental Monitoring and Audit Prioritization Scheme (PEMAPS) Questionnaire** of Proposed RIVER RESTORATION PROJECT THROUGH DREDGING ACTIVITIES CLUSTER OF ALAG AND LONGOS RIVERS located at Barangays Water, San Andres, Lumangbayan, Pulang Tubig, Putican Cabulo, Tabon-Tabon, Malapad, Sta. Cruz, Burburi, Catwiran I, Catwiran II, Alag, Poblacion, Santa Rosa I, Municipality of Baco, Oriental Mindoro is true, accurate and complete. Should I learn of any information, which makes this inaccurate, I shall bring said information to the appropriate Environmental Management Bureau Regional Office.

AUG 04 2023

In witness whereof, I hereby set out my hands this ___ day of _____ at Pasig City.

ALFREDO R. TOLENTINO, JR.
Chairperson and President
Bird's Nest Resources Corporation

SUBSCRIBED AND SWORN to before me this ___ day of AUG 04 2023 at Pasig City. Affiant exhibiting to me his/her Community Tax Certificate No. 33-10600[illegible] issued at D.C. on 2/21/70.

Notary Public

Doc. No. 387
Page No. 79
Book No. XXVII
Series of 2023

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NOTARY PUBLIC
Cities of Pasig, San Juan and in the Municipality of Pateros, Metro Manila
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TIN No. 232-590-023-000
G/F Pasig City Hall Brgy. San Nicolas Pasig City
Appointment No.132 (2023-2024)
Contact No. 09273112426 / 09499240131

Annex 11: MGB Area Clearance

Republic of the Philippines
Department of Environment and Natural Resources
MINES AND GEOSCIENCES BUREAU
MIMAROPA Region
7/F DENR Building, 1515 Roxas Boulevard, Ermita, Manila
Telefax No. (+632) 8536-0215 / (+632) 5310-1369
Email: region4b@mgb.gov.ph

ISO 9001:2015 CERTIFIED

20 July 2023

MR. ALFREDO R. TOLENTINO, JR.
Chairman and President
BIRD'S NEST RESOURCES CORPORATION
Room 402 Bencom Building
146 West Avenue, Brgy. Phil-Am
Quezon City

Dear Mr. A. R. Tolentino, Jr.:

This refers to the 13 July 2023 letter requesting for Area Status/Clearance on the proposed River Restoration Project through Dredging Activity on the Cluster of Alag and Longos Rivers located at the Municipality of Baco, Province of Oriental Mindoro.

Per this Office's record and projection in the Mineral Land Survey Maps, the applied areas do not overlap with any mining tenement applications/rights.

Please be informed that this Office also issues Area Status/Clearance to locally-issued Sand and Gravel (SAG) permit applications as endorsed by the Provincial Government (PG) – ENRO. However, Section 19 of Republic Act (RA) No. 7942, or the Philippine Mining Act of 1995 does not include dredging areas as areas that shall be closed for mining applications.

Further, pursuant to RA No. 7160, or the Local Government Code of 1991, the exclusive authority to issue permit to extract sand, gravel and other quarry resources containing an area of not more than five (5) hectares is vested to the Provincial Governor.

If the dredging area falls within existing locally-issued SAG permit applications, it shall be the discretion of the PG to choose its priority project over the area. Nonetheless, please coordinate with the Provincial Mining Regulatory Board to determine if there are existing locally-issued SAG permit applications within the applied areas.

Thank you.

Very truly yours,

By Authority of the Regional Director:

072023-R04B-1829 Letter 7/20/2023

EDWIN M. MOJARES, PhD
Chief, Geosciences Division
OIC, Office of the Regional Director

MINES AND GEOSCIENCES BUREAU MIMAROPA Region

"MINING SHALL BE PRO-PEOPLE AND PRO-ENVIRONMENT
IN SUSTAINING WEALTH CREATION AND IMPROVED QUALITY OF LIFE."

Annex 12: Hydrologic Modeling

Annex 13: Proposed Rehabilitation/Improvement of Riverbed at Alag River (Dredging Plan)